Chapter- 1

INTRODUCTION

"LEATHER" nothing like it is an old age and a true one. No substance equals it for the construction of articles for personal use. Leather has played an important role in day-to-day life of mankind from immemorial. Man from the very beginning, has been using animal skins for covering his body & legs from climatic conditions, keeping his provisions of water in goat skins, & making belts from various purpose. From ancient civilization to modern times, leather has been used by the human race one from or the other in its daily life & it is discovered everywhere & it seems that mankind can hardly do without these useful materials.

Leather is nothing but a natural fibrous protein sheet made from raw hide or skin through tanning and finishing in a tannery. Raw hide or skin has the following section or layers:

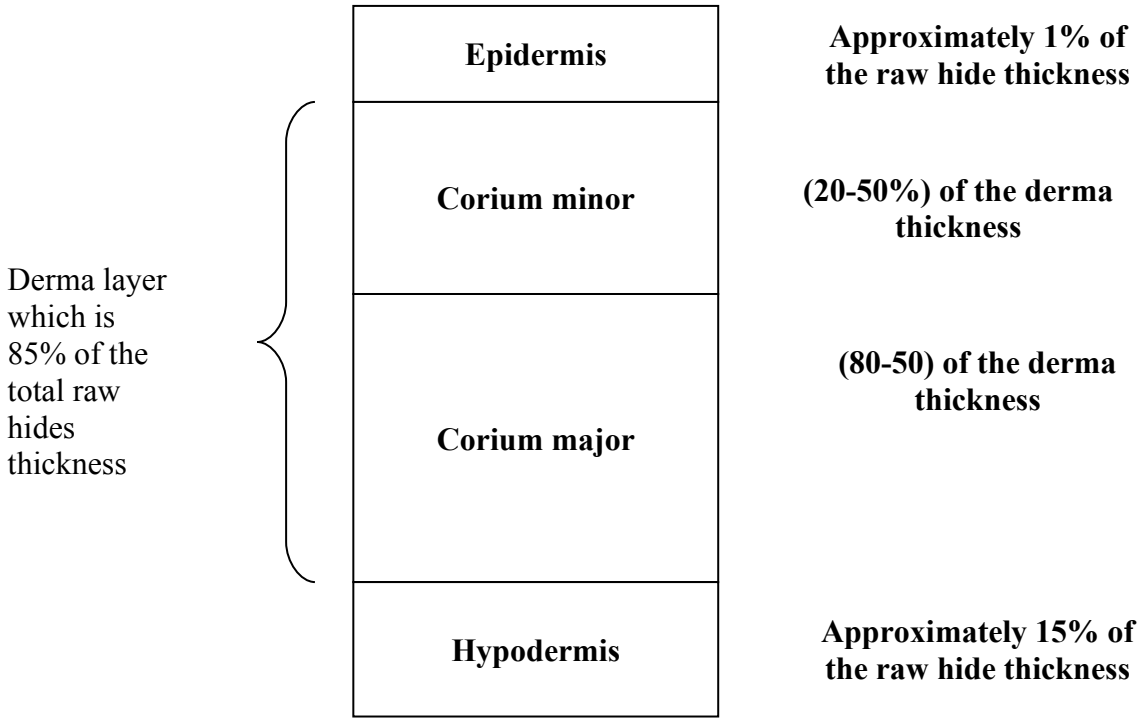


Fig: Various layer of hide or skin.

To convert the raw hides and skins to leather, the epidermis layer is first removed and the remaining section, called derma is tanned. Before tanning appreciable amount of

Hypodermic layer also is removed during fleshing of pertaining operation. Leather is therefore made from derma only which has mainly two layers:

1. Corium minor.
2. Corium major.

Primitive people, who lived during the Ice Age some 500,000 years ago, were likely the first to use the skins of animals to protect their bodies from the elements. Just as leather today is a byproduct, our ancient ancestors' hunted animals primarily for food, but once they had eaten the meat, they would clean the skin by scraping off the flesh and then sling it over their shoulders as a crude form of a coat. They also made footwear to protect their bare feet from rocks and thorns by taking smaller pieces of animal skin made to fit loosely over the foot and tied at the ankle with thin strips of skin or even vines.

The main problem that primitive man encountered was that after a relatively short time the skins decayed and rotted away. With his limited knowledge and experience, primitive man had no idea how to preserve these hides. As centuries passed it was noticed that several things could slow down the decay of leather. If the skins were stretched out and allowed to dry in the sun, it made them stiff and hard but they lasted much longer. Various oily substances were then rubbed into the skins to soften them. As time passed, it was eventually discovered that the bark of certain trees contained "tannin" or tannic acid which could be used to convert raw skins into what we recognize today as leather. It is quite hard to substantiate chronologically at exactly what time this tanning method materialized, but the famous "Iceman" dating from at least 5,000 BC discovered in the Italian Alps several years ago, was clothed in very durable leather.

Somewhat later, techniques used by the American Indian are very similar to those used in this early period. These Indians took the ashes from their campfires, put water on them and soaked the skins in this solution. In a few weeks the hair and

bits of flesh came off, leaving only the raw hide. This tanning method, which used a solution of hemlock and oak bark, took about three months to complete after which the leather was worked by hand to make the hide soft and pliable.

LEATHER PRODUCTS

"Nothing like leather" is an old adage and a true one. No substance equals it for the construction of articles for personal use.

Leather has played an important role in day-to-day life of mankind from immemorial. Man from the very beginning, has been using animal skins for covering his body & legs from climatic conditions, keeping his provisions of water in goat skins, & making belts from various purpose. From ancient civilization to modern times, leather has been used by the human race one from or the other in its daily life & it is discovered everywhere & it seems that mankind can hardly do without these useful materials.

The products made out of leather land themselves to an enormous variety of both useful & essential items, which are a need & asset in modern living. An extensive range of colors & designs widen the selection range which encourage the prospective consumers to put this products to use in a multitude of ways be it fashionable or functional.

The term "Leather Goods" is applied & confined generally to the articles or gods made mainly of leather & intended for carrying personal belongings, such as the smaller items, which can be carried in hand or shoulder. The variety of leather goods we come across everyday is countless. When there are a variety of articles that differs so much in size, design & method of construction, then it is absolutely necessary to classify them into separate convenient articles of similar kind. In this project report, classification of leather goods has been defined in confined terms.

Now a day because of leather becomes a costly commodity, hence goods made of synthetic or man made fibers are also termed as leather goods, but these goods are definitely much lower in price compared to "genuine" leather. But the methods of construction or fabrication are the same for both. In this project report, the real leather is taken for consideration.

HISTORY OF LEATHER PRODUCTS

The making of leather product is today a considerable subject, conducted in most of the principal cities of the world. It is an industry which had its beginning in the early civilization. Specimens of ancient work are preserved in the museums, many having been recovered from the tombs of the early kings of Egypt. The industry has progressed through the ages down to the present day, with an indication that it will continue for centuries to come. However, here we presented century wise a brief history of different leather products.

In Egypt, leather artifacts were found in tombs built as early as 3000B.C. evidence that the pharaohs wore leather sandals. During 750B.C. the Romans made leather footwear, clothing & ornaments. At that time, Teutonic tribes in the cold north of Europe wore whole garments of leather. And the Roman soldiers came back to Rome wearing leather trousers called braccae. By the thirteen century, the Romans introduced money bags. They also introduced the coin purse.

By the fifteen century, many homes contained finely detailed Spanish leather, which was used in wall hangings, upholstery, book covers, vests & jackets.

In sixteen century, a special type of leather called Morocco leather was tanned from goat skin & it was used in many purposes. We also know that Englishmen drank their beer out of mugs that were made from leather.

The 1990s:

In the early 1990s, upon the advent of the open automobile, rich men wore long motoring coats made of leather to protect them from the elements. They also wore leather trench coats fashioned after the British military officer's coat.

The 1920s:

During the 1920s, women's leather & suede sports were began to appear, both in Europe & the United States. Also during the 1920s interior designers namely Corbusier & Marcel Breuer integrated cowhides with their polished steel furniture during the Bauhaus period.

The 1930s:

In France, in1930, the designer Paquin created a suit using goat suede & wool.

The 1940s:

During the 1940s & 1950s, shades of tan, rust & brown were predominant in suede for both & woman. One of the most popular jacket styles in 1949s was the aviator jacket. Even die-hard army commanders like general pattern wore then during the world war-I I.

The 1950s:

Bonnie Cashion was the first American designer to create off-white cabretta leather coat. In early 1960s, designers began to provide new colours in leather.

The 1960s:

In 1960, designer's created many leather & suede garments, in combination with fabric & knit, as well as leather & suede ensembles. Ornamented leather garments were fashionable in 1960 century probably the most popular coat during the late 1960 century was the embroidered goat skin jacket by Mallory.

The 1970s:

The 1970 century saw a return to the more sophisticated leather garment. By 1978, Claude Montana was quickly establishing himself as the king of women's leather apparel design.

The 1980s:

By the 1980s, leather to be a luxury item. Designer's used it to make fashionable colours leather goods; pants, suit, leather coat dress, leather pouf dress etc are the gifts of the year likely1980.

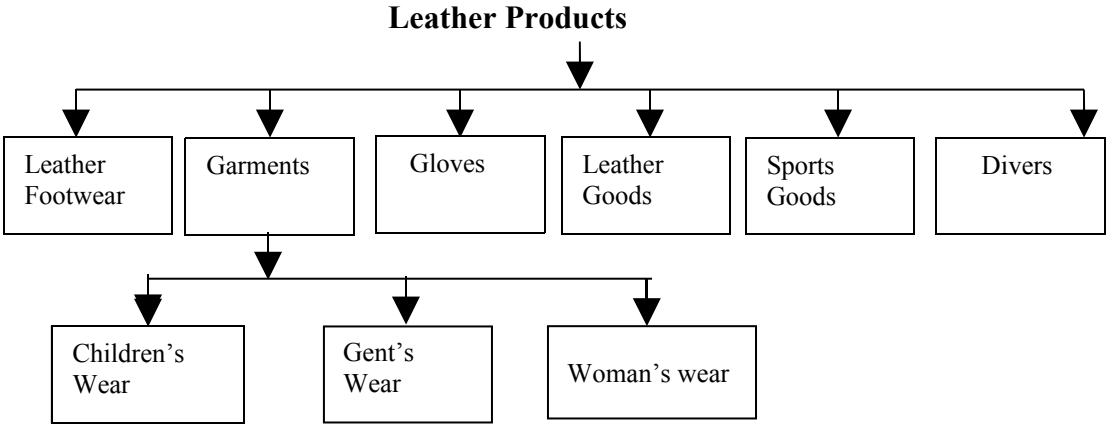
The 1990s:

Novelty skins were becoming popular in Italy & France in the early age of 1990.Different luxurious leather products was created, from the designer to budget category. The history of leather products, actually an unbelievable length of time,

from the earliest time to today's sophisticated fashion. The art of leather products manufacturing will add a new dimensions to the world by the time 2010.

CLASSIFICATION OF LEATHER PRODUCTS

A leather product means any type of footwear, goods or leather apparel. However, the well-known classifications of leather products are given below.



Now we will study about leather goods. Leather goods refer to articles made mainly of leather & intended for the containing of personal belongings. Some leather goods are small in value & some special forms of leather goods are purely decorative. However, leather goods are classified according to the points into consideration.

A) According to volume.

B) According to the degree of reinforcements.

C) According to the utility.

GENERAL CLASSIFICATION OF 'LEATHER GOODS

Now we will study about leather goods. Leather goods refer to articles made mainly of leather & intended for the containing of personal belongings. Some leather goods are small in value & some special forms of leather goods are purely decorative. However, leather goods are classified according to the points into consideration.

A) According to volume.

B) According to the degree of reinforcements.

According to the volume, the different classes of leather goods are as follows.

1. Small leather goods.
2. Medium leather goods.
3. Heavy leather goods.

1. Small leather goods:

The goods are made from leather having sometimes of (0.5-1.00) mm falls under this category. Sometimes these goods are called Fancy leather goods or personal leather goods. The different type of skins, which are used an animal in the suckling Calf is the terms generally used to describe stage. Then making light leather goods are-

Calf Skin: average size of the skin is from 6 to 10 sft. It is used for making wallets, coin purses, passport covers, key cases etc.

Goat skin: Its average size is 4 to 6 sft when dyed, when dyed it is very rich in appearance. It is used for making wallets, bill folds, passport covers etc.

Glace kid: It is made from goat skin and tanned with a smooth, bright glossy finish. It is used for making wallets, bill folds, passport covers etc.

Morroco: It is goat skin tanned with a characteristic grain developed naturally. It is used mainly for making wallets, coin purse, underarm cases etc.

2. Medium leather goods:

Medium leather goods indicates the proposal thickness of (0.8-1.2) mm. ladies bags, side bags, shoulder bags etc are called medium leather goods.

Calf skin: Dyed calf skins cow/butt is best suited to make flap over & framed hand bags.

Nappa: Soft, full grains of clothing leather made from cow, calf, sheep or goat are extensively used in hand bags manufacturing. This leather is glossy

and more dirt resistant than suede leather. Nappa leather are best suited for making leather garments and turn type of hand bags like shoulder bags, disco bags etc.

Suede leather: suede leathers are mostly made from goat & sheep. These leathers are finished with a nap on the flesh side. These are finished with a nap on the flesh side. These are mainly used in making novelty hand bags.

Exotic skins:

Reptiles: Reptiles are the skins of crocodile, alligator lizard & snake skins. These are largely used to make exclusive bags.

Lizard skin: Lizard skins with beautiful grain are finished in charming shades. These are used in framed purses, hand bags etc.

Snake skin: Python skins with its striking pattern of attractive shades are used in hand bags, framed purses etc.

Crocodile skin: The belly of the skin is used as the heavily scaled back being too coarse & horny. The beauties of the scale are best suited to make wallets, hand bags & other novelty goods.

3. Heavy leather goods:

These are made generally from cow & butt hides which are strong & durable. The hide has distinct surface grain patterns & the size ranges from 20 to 30 sft. These types of goods are made from heavy leather bearing the thickness of (1-1.5) mm. Suitcase; Luggage etc are the examples of the class.

Box sides: These are black in colour with distinct surface grain & are used for making documents cases, attaché case etc.

Willow sides: These are brown in colour with distinct surface grain. These are used for making briefcase, travel suitcase etc.

Care sides: These are firmly dressed leather, stained or otherwise colored having a smooth move or less glossy surface finish. These are used for making document cases, travel suit cases etc.

Kattai: These are finished in black or brown colours with fine smooth surface grain. These are used mainly for making transistor cases, instrumental cases, medical representative bags etc.

Split leather: These are the under layer of the sides. The split are sometimes finished with pigments coating & an artificial grain is produced by embossing. Naturally finished split are used for making wall hangers, patch bags etc. Coloured split are used for making shopping bags, shoulder bags, shaving kit etc.

According to the degree of reinforcements being used, leather goods are three types. Namely:-

1. Limp leather goods.
2. Semi-Limp leather goods.
3. Stiffened leather goods.

1. Limp leather goods:

The leather goods are made without applying any internal stiffener or reinforcement, are simply known as the limp leather goods. Most pocket goods are made in this way.

2. Semi-Limp leather goods:

The articles for various reasons have a paper or stiff fabric material as a foundation between the leather & lining, so imparting a degree of reinforcement or firmness. These goods belong to the class of semi-limp leather goods or semi-stiffened leather goods.

3. Stiffened leather goods:

Others are built up on a foundation of stout pulp board, so making the completed article quite coming under the heading of stiffened leather goods.

Stiffened leather goods are sub-divided into the groups, such as:-

- Moulded leather goods.
- Box or Built up leather goods.

Moulded leather goods:

Moulded work is the class of goods of the container type, in which the foundation is made by gluing successive layers of paper around a block of the required shape & size; the "Moulding" thus formed being covered. Moulded work is within the province of both small & large goods.

Box or Built up leather goods:

The articles are made on a foundation of sheet pulp board, the pieces being cut to definite sizes & "Built-up" to form a box, then strengthened with fabric & afterwards covered with leather & lined. These classes of goods are said to box or built-up leather goods. They are subjected to fancy leather goods.

According to the utility another type of classification is available which is referred as modern classification of leather goods.

There is wide variety of leather goods produced in the modern life. The classifications are –

A. Apparel
B. Leather accessories
C. Footwear
D. Decorative items.

A. Apparel:

1. Hats:
    a. Berets
    b. Peaked cap
    c. Brimmed hats

   d. Decorative berets hats
   e. Shearing hats

2. Ornaments:
   a. Pendant
   b. Necklace
   c. Hair slide
   d. Ear ring
   e. Hand band
   f. Bracelet

3. Shirt:
   a. Short sleeves shirt
   b. Full sleeves shirt
   c. Sleeveless shirt

4. Skirt
   a. Short skirt
   b. Mini skirt
   c. Long skirt
   d. Ridi skirt

5. Tops
6. Belts:
   a. Waist belt
   b. Watch belt

7. Under garments
8. Chest fit
9. Jacket
10. Over coat
11. Blazer
12. Dangiri
13. Trouser / Pants

14. Shorts
15. Stoking socks
16. Gloves
    a. Fancy gloves
    b. Industrial / Protective gloves

B. Leather accessories: (Classification)

1. Bag:
    a. Cut edge hand bag
    b. Bucket bag / oval – base bag
    c. Snap top sling bag
    d. Brief bag
    e. Turned over edge bag
    f. Daisy bag
    g. Square bag
    h. Shoulder bag
    i. Shopping bag
    j. Dorothy bag
    k. Knitting bag

2. Wallet:
3. Purse:
    a. Neck purse
    b. One piece purse
    c. Two piece purse
    d. Stiffened purse

4. Tiny case / Box:
    a. Jewel box
    b. Shoe brush box / case
    c. Document case
    d. Camera case
    e. Thread case
    f. Scissors case

g. Needle case
h. Cigarette case
i. Beauty box / Manicure box

5. Suitcase
6. Traveling bag
7. Cigarette box

C. Footwear

1. Open type

- Chappal
- Slipper or slip-on
- Clogs

2. Close type

- Oxford shoe
- Derby shoe
- Boot
- Court shoe
- Moccasin

D. Decorative items

1. Table decorative items

- Mirror frame
- Light switch board
- Note book cover
- Pen holder
- Photo frame

2. Upholstery

Sport goods

1. Football
2. Cricket ball
3. Rugby ball
4. Tennis racket
5. Base ball
6. Volley ball
7. Basketball

Fancy:

a. Purse
b. Cigarette case
c. Wallet
d. Scissors box
e. Jacket
f. Blazers
g. Mobile cover
h. Spectacle cases etc.

Chapter-2

ROLE OF RAW MATERIALS FOR THE MAKING OF LEATHER GOODS

Man has come a long way from the days of his primitiveness and so has leather. In today's life the role of leather is varied and vast. The products made out of leather lend themselves to an enormous variety of both useful and fashionable items which bare a need and asset in modern living. An extensive range of colors and designs widen the selection range which encourage the prospective consumers to put these products to use in a multitude of ways, be it fashionable or functional. Hence, the study of materials is very important in the manufacture of leather products.

Finished Leathers:

These are the basic materials required in leather goods manufacture. Finished leathers of different types are used in the fabrication of a wide variety of leather goods. Goat, sheep or calfskins are used in the manufacture of light leather goods. Cow and Buff hides are used in heavy and luggage goods. Softy uppers, sheep and goat nape or suede leathers are used in making handbags. Softy leathers are exclusively used in "Turn Type" of articles.

Light Leather Goods:

These are mostly made from skins such as calf, goat, sheep etc. These leather goods require leathers having thickness of about 0.8 mm to 1.00 mm. The different types of skins which are used in making light leather goods are,

(i) Calf Skin:

Calf is a terms generally used to describe an animal in the sucking stage. The average size of the skin is from 6 to 10 sq-ft. Natural finish of the skins is used for tooling work. It is used for making wallets, coin purses, passport covers, key cases, etc.

(ii) Goat Skin:

Its average size is 4 to 6 sq-ft. When dyed, it is very rich in appearance. In natural finish, it can be used for tooling. It is used for making wallets, bill folds, passport covers, etc.

(iii) Glace kid:

It is made from goat skin and tanned with a smooth, bright glossy finish. It is used for making wallets, bill folds, passports covers, etc.

(iv) Morocco:

It is goatskin tanned with a characteristic grain developed naturally. It is used mainly for making wallets, coin purses, underarm cases, etc.

ACCESSORIES

Accessory not only gives richness to the design Accessories play a vital role in designing & production of leather goods but also durability products. For the manufacture of leather goods accessories are grouped into-

Fitting:

Fitting comprise are following:

- **Locks:** these are fitting which may or may not have locking arrangement. Locks are used as a closing device in a variety of leather goods. They are may be either made of brass or chromium plated.

- **Hand bag frame:** Frame are either made of brass or plated with chromium. These are available in size from 3" to 12". 3" to 5" are used in framed purses. Frames are manufactures are different shapes.

- **Strap fitting:**
  - **D rings:** They are metallic rings available in brass, chromium or anodized steel. The D rings hold the strap of the bags. D rings are used in a variety of leather goods.

  - **Round rings:** These are similar to D ring except they are round shape. These are also chromium plated, brass and anodized iron. The function of this fitting is the same as D rings. These are also available in size from ½" to 1½".

- **Buckle fittings:** Belt buckles come in a variety of design. They may or may not have hooks. They are extensively used in making belts with different styles.

- **Adjustment fitting:** These are plated with chromium or anodized or made of brass. The buckles have center stem. The length of the strap can be adjusted by sliding the buckle. These are available in size from ¾" to 1½" these are usually used in shoulder bags.

- **Watch strap buckles:** These are available in brass or chromium & sold in sizes 9mm, 10mm, 12mm, 14mm, 16mm & 18mm. They are made in different style &used in writs watches.

Fasteners:

Attaching part with different varieties of fittings are called fasteners. These are to followings-

- **Rivets:** Rivets are used for attaching two pieces of materials where considerable strength is required these are metal fastening pins with split end. These are two types of rivets available & lock rivets.
- **Rivet button:** Rivet button otherwise called chappal buttons are extensively used as a fastener in a variety of leather goods. They are available in a variety of colour.

- **Eyelets:** Eyelets come in a variety of colour & also brass or chromium plated. Small eyelets are use in footwear industry.

- **Studs:** Studs are available in small, medium & big sizes with different shapes. The studs may be metallic or synthetic. Metallic stud have split stem while synthetic stud have a hole or filled with metal thread. These are extensively used in heavy luggage, goods like travel bags, suitcase etc.

- **Zippers:** Zipper may be metallic or synthetic & come in matching colour, zippers come in different sizes. It is a closing device & used in a variety of leather goods & leather garments. Zippers are sold according to length & quality.

POLY (ETHYLENE VINYL ACETATE, EVA)

Poly (ethylene vinyl acetate), otherwise known as EVA, is a random co-polymer of ethane and vinyl acetate monomer units with a vinyl acetate content of around 20%. Pure polyethane is a soft plastic material whose long chain molecules are capable of crystallization to quite a high degree. This is a due to the fact that there is a regular variation in shape and size along the chains which allows them to lie straight, parallel and closely packed together. The random inclusion of the larger vinyl acetate units in the polyethane chains destroys their regularity of shape, effectively reducing their ability to pack closely. Consequently EVA chains take a more coiled-up non-crystalline structure which results in a more rubbery character.

Lining:

Lining of different kinds is used in a variety of leather goods. Lining is an inner coverage of leather Product linings have functional & consumer appeal objectives. Making a lining pattern for leather products is like making a lining for different leather goods. Some skins, such as lamb suede, feel rough or look unsightly on the inside. Designers usually will add a lining to conceal the imperfections.

To make unlined leather goods, purchase specially processed leathers with insides as nice as outsides.

Objectives:

The purposes of lining are:

- To cover any defects on the flesh side of leather used in the article.
- To add strength to the weaker type of leather.
- To match the outside and inside colours of the article.
- For decorative purpose.
- To improve the over-all look of the article

Variety:

- Cotton
- Printed cotton
- Brushed cotton
- Polyester
- Printed polyester
- Sattin
- Poly satin
- Taffeta
- Polyonosic
- MM Dabu (viscous polyester)
- Twilted (Polyester, Sattin, Cotton)
- Wool and fur. (Natural and synthetic)
- Crepe
- Canvas

Consumer appeal:

An important factor of consumer appeal is to present leather goods whose inside has an attractive appearance. The surface and luster properties of the lining have a considerable influence on this, and those properties for linings most widely used are:

- ***Taffeta:*** A Crisp fabric woven with a faint warp pattern which produces a shiny surface. These linings are generally piece – dyed which helps to soften them and make them able to withstand normal washing and dry cleaning process.

- ***Crepe:*** Made from specially processed years, mostly viscose acetate, the finished surface of this lining has a minute and uniformly crinkled appearance.

- ***Satin (sateen):*** This lining is characterized by a smooth and highly lustrous surface and a dull back. Satin is the name of a weave pattern

and all – cotton fabrics that were once constructed with this weave pattern were called sateen.

Colour also plays an important role and linings with a woven, printed or embossed pattern can give an extra fillip to a garment. Some large companies incorporate their logo in the weave pattern of their linings.

Miscellaneous:

a. Threads:

To provide good sewing performance, a thread must have consistent size, strength, stretch and needle heat resistance. The strength and suppleness have to be sufficient to withstand the rigorous of stitch, formation while stitching in the sewing machine. The thread selected for sewing has to provide satisfactory appearance in the seam in both stitch formation and color match. Compatibility between the material and thread is equally important for strength, stretch, abrasion resistance and durability.

Sewing threads are made from two types of fibers.

1. Natural fibers (cotton, silk and linen) and
2. Synthetic fibers (nylon, polyester, rayon. etc.) natural fibers provide the best sew ability while the synthetic fibers provide the best seam performance. Cotton thread is vulnerable to abrasion during the use while synthetic threads provide excellent seam strength and have very good abrasion and wear resistance.

Polyester – cotton and nylon – cotton are also used on a large scale in the manufacture of leather goods. Special futures of using them are:

i. Improved sew ability because it is less harsh than a pure synthetic thread;
ii. The cotton wrap acts as an insulation against needle heat resistance during sewing;
iii. Extra seam grip avoid running back of seams at the start of finish;

iv. Fill the needle hole completely as the cotton cover has higher moisture regain which allows it to swell.

v. Prevents finer materials such as light leather from having cut by the hard synthetic core.

The following types of threads are commonly used:

Mercerized Cotton	Approximately 10% stronger than normal cotton.
Nylon	Its main advantage is greater tensile strength permitting a finer thread and finer needle for a seam of the same strength.
Nylon / Cotton	Smooth running and soft.
Polyester / Cotton	Superior in strength to cotton. The cotton covering provides improved flow through the needle, reduced cutting of the leather by the polyester and also protects the stretches during heat treatments.
Linen thread, double twist	This is made from chrome tanned splits. It is mainly used for decoration.

In an extensive series of tests, the polyester / cotton threads gave the best overall performance with request to seam strengths both initially and after various ageing tests. Cotton suffered considerable losses in strength on artificial ageing and storage.

Relation between needle, thread & material

Thread Thickness TKT No.	Light Material		Medium to heavy material	
	Needle Size		Needle Size	
	NM	SIZE	NM	SIZE
80	65-70	9-10	70-80	10-12
60	80-90	12-14	90-100	14-16
40	90-100	14-16	100-110	16-18
30	110-120	18-19	120-130	19-21
35	110-120	18-19	120-130	19-21
20	120-130	19-21	130-140	21-22
25	130-140	21-22	140-160	22-23
15	130-140	22-22	140-160	22-23
10	140-160	22-23	160-180	23-24
8	160-170	23-24	180-200	24-25

b) Adhesives

i. Solvent based:

Rubber solution is a solvent based and composed of crepe rubber and petrol (Gasoline). It provides sufficient grip while stitching. It has only a temporary bonding effect and hence and leather goods bonded with rubber solution must be stitched.

ii. Water based:

Synthetic resin adhesive is also used in attaching lining and components for making leather products. This provides good strength and does not stain the lining.

iii. Synthetic rubber based adhesive

This adhesive is extensively used for making stitch less articles and also attaching components where stitching is not possible. It has a permanent bonding effect and hence stitching not necessary. It has added advantage over other adhesives like glue, starch, paste, etc because curing takes place immediately. Care is absolutely necessary is applying to the components because excess application of adhesive causes permanent stain in the lining.

c) Needle

Sewing leather is less difficult than fabric as it – does not slip under the presser food. A leather pointed needle is used which is particularly designed for stitching leather. The wedge point makes a clear cut in the leather resulting in a uniform stitch.

Needle No.	**Application**
No. 14 & 16	Light leather goods like coin purse, Wallets, key cases, etc.
No. 18 & 19	Medium leather goods like wrist bags, Hand bags, etc
No. 21 & 23	Heavy leather goods like Document cases, travel bags, etc.
No. 26 & 28	Multiply layer construction and handle.

d) PAPER AND BOARDS

i. Blotting paper / cartridge paper:

These are used for cutting patterns and for lining purposes.

ii. Mill grey board:

This board has smooth surface on one side and coarse surface on the other side. The board is used for making moulded articles, viz. jewel box, pen holder tumblers, etc. In articles where the foundation is given, the coarse surface of the foundation is covered by sticking mill boards. This helps to get uniform smooth surface while covering with leather.

iii. Straw boards:

Yellow straw boards are used in making moulded type of articles like jewel box, pen holder tumbler, pin cushion etc. These are sold by weights.

iv. Elastic Bands:

Elastic is used in leather goods, where elastic pockets are necessary. Elastic is also used in head bands, travel, suitcase etc. It comes in various colors and sizes.

v. Foam rubber sheets:

Polythene-foam rubber sheets are used in a variety of leather products for providing cushion effect. These come in various colors and sizes. Generally, foam rubber sheets of the size 2m 1m and 3mm thickness are used.

vi. **Piping wire:**

These are synthetic wires which are used for providing piping to the articles. Piping wire is mostly used in softy type of articles. Piping wires of thickness 1/32", 1/16, and 1/18" are used in making leather goods.

vii. Crepe rubber sheet:

This is thin sheet and used to remove excess adhesive in finishing. These are also used to prepare rubber adhesive.

viii. Caster wheels:

Caster wheels are used in luggage goods. These are fixed to heavy travel goods/luggage goods, which cannot be easily lifted physically. Castor wheels facilitate the goods to be pulled from place to another easily.

Bench operations / Pre Assemble and assembly / Preparation Process:

There are certain operations to be done on the cut component materials before & during the course of the assembling & these jobs, carried on benches or tables are known as bench operations in leather goods technology. The work carried out on benches consists of:

1. Marking
2. Creasing
3. Edge dyeing or staining
4. Punching

5. Eyeleting
6. Cementing
7. Edge Folding

In the past, all these operations were done by hand, but now-a-days, machine have replaced the hand labor. These machines are simple presses, either operated by foot or hand. Such machines are known as universal press & the advantage are manifold. Operations done on these machines contribute to:

1) Cut the monotony or drudgery of labor
2) Assure uniformity of product range
3) Least rejection
4) Higher productivity
5) In-built quality control

Some of the bench operations are described below, in simple manner for easy understanding:

1. **Marking:**

After receiving each component in bulk quantity in bundled condition, bye using of marking pattern on each component has been marked for placing reinforcement materials, fixing decoration, lock, buckle, frame and other fittings.

Process control:

1. Choose the right marketing pen/pencil.
2. Ensure the proper lighting.

Procedure:

1. Keep the cut components pair wise on the table.
2. Checking for color marking.
3. Check the components size with pattern.
4. Then write job card number, size, pair number (if necessary) on each components and every pieces by silver marker/pencil.

5. The match marked, pieces are grouped in sized and stored in the plastic covers.

Acceptance criteria:

The pair should be matched properly and numbered clearly as per job card.

2. Creasing:

The creasing operation consists of lines with a heated iron & is used in both cut edge & turned over edge construction. Creasing helps in compressing the fibers at the edges & thus strength the edge. Incidentally it gives also a decorative & aesthetic appearance. There are variety of creasing irons, used depending upon the work on hand. There is single line creaser, double line creaser, some with adjustable guides etc. care is taken to see that the working or ironing edges of all creasers must be smoothly finished avoid scratching during creasing operation & the forepart & heel is slightly rounded off. Some of the point to be noted while creasing is:

a) The creasing line is close to the edge say 1/16" within the edge &
b) The line marked should be distinct & of polished appearance.
c) For this, the iron is heated to the correct temperature.
d) The strength line must be creased first and then followed by concave or convex lines.

In the case of bulk production, machine creasing is done. For belt & straps with straight edge, machine creasing is preferred. It consists of a horizontal roller, with a heated washer or wheel resting on the working platform & the heated wheel with semi sharp edge serves as the creaser & can be made of any thickness depending upon depth of the impression needed. The distance of the washer from the edge is adjustable as well as pressure exerted by the washer/ wheel on the work could be adjustable with the help of a hand screw. When the machine switched on, the roller starts rotating & the work is fed, resting against the guide plate and the heated washer (thermostat controlled) as a
creaser. The work is done quicker & cleaner & quality control assured in this case.

Another method of creasing is the use of the simple universal press. The creasing lines are in the from of a die & this heated die is pressed on the leather either by hand, or the machine can be operated either by hydraulic pressure or pneumatically.

3. Edge dyeing:

In order to give bright appearance to the edge of school bag, staining or dyeing of edge is done. The coloring is normally done by applying the dye with a wooden split with a piece of sponge, cloth or cotton can also be used, but is care taken to see that the felt or the sponge is not loaded too much with dye solution as otherwise it will run over the edge & spoil the flat leather surface. Edge dyeing by hand is never done on cut components on a single piece basis at time, as it is a time wasting exercise. A group or bundle of cut component is taken at a time & one stroke, all the edges are stained. When the fibers are found to be a little coarse along the edges, a thin wax coat is applied before polishing with a cloth. A mixture of carnuba wax & bee wax is ideal for this purpose. When the leather is very fibrous & fry at the edges, coloring is difficult and to overcome this difficulty, a mixture of paste & stain is used & this makes fibers adhere together.

In the case of bulk production, edge staining is done on machine called ‘edge stainer’. This consists of a container or receptacle at the top holding the dye solution. From it, runs a small tube below ending in a nozzie with pin hole. This tube is surrounded by a copper (solution) coil. When the machine is switched on, the central vertical tube is give enormous vibration movement and the dye solution oozes out of the pin hole at the side of the muzzle. The leather edge of the article or component is held against this nozzle. The leather edge of the article or component is the nozzle and moved form left to right horizontally and the edge is smeared with the dye.

4. Punching:

Punching is the process of making hole in leather components using asset of a hole punches for fixing of buckles, lock, decoration, eyeleting and any other accessories and fittings. Mostly punching is done in the stage of preparation,

but it can also do at the stage of preparation, but it can also do at the stage of assembling. In bulk production punching has been done in machine. In the preparation (pre assembly), after creasing and punching operation is finished leather components are attached with reinforcing materials depending on the design to be done. First, if it has any reinforce material on the design, we have to attach reinforce materials with foam (to get spongy and comfort feel) by applying adhesive gently.

5. Eyeleting:

The eyeleting operation consists of first punching a hole in the leather by means of punch and mallet gadget (rod with around nipple at the end) the free end of the eyelet is uniformly spread out along the perimeter of the hole. The spread out tiny metal corners bind themselves firmly into the flesh side of the leather. Now a day, eyeleting is done fast by an automatic machine.

6. Cementing:

Cementing is an important operation the manufacture of school bag as at this stage only, the different components of leather and reinforcements are joined together by means of application of an adhesive and on the strength of the joints depend the very existence or in other words, the relation of the shape of the articles, for further strengthening, the joined parts are invariably stitched.

Cement or adhesive used in the fabrication of school bag of two type's i.e.

- **Temporary adhesive:**

When stitching dose the final assembly, temporary adhesive is just hold the various parts-temporarily.

- **Permanent adhesive:**

Where stitch is not possible/not used for decoration there should be used permanent adhesive.

Rubber in the form of rubber solution, (rubber dissolve in petrol) in the form of natural latex or in some other water based emulsion systems is used

generally. It is applied on both side and after allowing drying a little to have a dry tack, the surfaces are struck or hammered together lightly. These adhesive are applied by means of brush. Just like edge dying, when a series o edge of a number of articles have to be cemented, they are arranged in a row so that the edge of the one component lies next to the edge of the others and so on arranged on the bench. The stack passed on to the next table where another side of the stacked edges will be given the coating of adhesive. Thus in one or to

Operations, we are to able cover edges of say two or three dozen articles at a time, thereby cutting down the time factor.

Process control:

1. The brush should be clean.
2. Ensure that the blow is clean without any contaminants.

Procedure:

1. Choose the right brush and adhesive.
2. Apply adhesive at the marked places of both components to be attached.
3. Apply adhesive fully on the leather boards and upper area to be attached (in case of leather board).
4. Attached the components together.
5. Check for proper attaching.
6. Hammer the attached portion well.

Acceptance criteria:

1. Apply the adhesive evenly.
2. Component should be attached perfectly to the marking.

7. Edge Folding:

Folding is one of the operations that come across frequently in the course of fabrication of school of school bag. It is simply an operation or devise of folding the edge of the leather uniformly along are the edges to a pre-determined width either in straight line or in curves. The folding is done to improve overall appearance of the product.

Normally a skived edge is coated with cement as stated in the cementing operation and then with the help of bone folder, the edge is folded over along the entire length of the edge of the leather. Sometimes, it is folded over foundation or leather itself. For greater volume of work, folding machines are used. The machine is simple treadle operated press with a work table attached with guide plates and the leather edge can be folded to any desired width by means of a lever rod, the guide bar rotates through a fixed angle taking along with it the leather, thereby simultaneously folding the leather edge. When the foot lever is released, the guide bar springs back to horizontal position and the folded leather piece is removed and a new one inserted.

FIXING OF ACCESSORIES AND FITTINGS:

Fixing of locks, decorations and other fittings is done manually or by machine. Fixing operation is done with two types of tolls one with hollow dip at one side and the other with ting protruding nipple at the end. When fixing the decoration, care is taken to hummer of accessories and fittings as heavy hammering many damage the lock, decoration etc.

Assembling:

After pre-assembling (preparation) process is done, the next step is assembling various individual to get structure of articles. To assemble this component before cementing of edge that are folded at the stage of preparation, a grain part of fold edge are properly scratched to ensure bonding strength of adhesive and then adhesive gently. Applying of adhesive on unnecessary part of component affects cost, time and quality of production. After a while component

affects cost, time and quality production. After a while components joint together and hammered gently and transferred to stitch operation.

Stitching:

Stitching is the most important operation that decides the quality of the end products. So, stitching is tested on a waste piece of leather before stitching on the product.

Basically in dairy cover production **Flat Bed and cylinder bed** sewing machines are used.

To stitch this type of goods, we have to use **light duty machine.**

Flat bed sewing machines are provided with two needles to make two parallel lock stitch seams and also, flat bed machine is provided with a zigzag stitching operation for decoration,

NEEDLES:

In production of dairy cover selection of proper needle for appropriate operation gives a good appearance at the end product.

Needle is s an important tool of the sewing machine which pierces the materials to be stitched and facilities to stitch during stitching the selection of correct needle depends upon the needle size needle system as well as the needles point.

The main functions of the sewing machine needle are:

1. The needle has been able to penetrate the material being sewn, without damaging it by pushing the years a side.

2. The needle thread can wholly or partially pass and from a loop which can be picked up by the looper or hook mechanisms

Needle are specified by-

1. Needle system
2. Needle size/Thickness
3. Needle point

1. **Needle system:**

The needle system refers to the fitting measurements of the needle which enable it to be suited for a particular type of sewing machine.

System	Shank dia	Needle length	Clearance cut	Shank length
134	2mm	38.5mm	Normal	Normal
134-25	2mm	42mm	Normal	Normal
34	1.6mm	38.5mm	Normal	Normal
134kk	2mm	38.5mm	Normal	Less than 134sys.
438	2mm	38.5mm	Normal	Normal

Generally, 134 needle systems are used in dairy cover production.

2. Needle point:

Needle point plays a crucial role in aesthetic finish of the seam. Further, the point is important for penetrating the leather / reinforcing materials. In leather, the seam style is determined by the point.

Points and tips have a decisive bearing on the performance of the needle and the various types of combination can be divided into two groups.

Round points

- Normal round point
- Slim set point
- Stub point
- Light ball point
- Medium ball point
- Heavy ball point
- Extra- heavy ball point

Cutting points

- Wedge point

- Cross point
- Reverse point
- Twist point
- Triangular point
- Square point

3. Needle size:

Needle size/thickness refers to the diameter of the needle blade just above the clearance cut of the needle. The required size of needle depends upon the type and size of thread, material and the amount of penetration force needed. The needle size is expressed in number metric (NM) system or Simon co. (singer) system. In NM system, size is indicated in 100^{th} of a mm. Similarly in Simon co. system, size indicates $1/16^{th}$ of an inch.

Generally needle size is 60-200. Needle size is becomes larger, increasing the needle number.

In production, usually small needle size is used. Larger needle size is used for decoration.

Shape of the Needle

Consultation of the needle manufactures, catalogues reveals a bewildering choice of needle and even in the leather section a wide choice is available. For leather, a needle with a cutting point is essential so that the material is pierced with the minimum of friction. Two basic shapes are recommended.

The wedge shaped needle is the most popular. The cutting edge is 70% of the diameter of the needle which is generally 1.2 mm wide at the maximum. The needle leaves a hole approximately 1mm long. The orientation of the edge can be particular to the line of sewing which gives the maximum number of stitches per inch and the strongest seam for a give stitch length. It is, unfortunately, a some what unsightly seam. The neatest seam is product with the wedge parallel to the direction of sewing, but this type o seam is also the weakest and there must be a limitation on the number of stitches per inch otherwise the leather can be completely cut. The compromise of appearance and performance is obtained using

the reverse twist needle where the wedge is at 45 degree to the line of stitching (that is on a south west to north east line) with the threading from west to east, as shown below.

The needle should be designed so that the thread lies within its overall dimensions.

The very small triangular point needle is a more recent introduction. It is essentially a round needles with a small triangular shaped tip with very short cutting edges. It has a better piercing action through the leather than the round needle and gives a more uniform stitch formation. It requires a somewhat greater force for penetration than dose the wedge but leaves a neater hole.

As with the wedge shaped needle, it should be designed so that the thread lies smoothly within its overall dimensions.

THREAD:

Almost all garments produced have one component in common: the sewing thread. Whilst sewing threads are usually a relatively small percentage of the cost of a garment, they have an extremely significant influence on the appearance and durability of the finished product. The production of sewing threads is an extensive and complex and complex subject.

SEWABILITY

The tern describes the basic all round properties of the thread, including.

- Not breaking when used for high speed sewing
- Facilitating the consistent of stitches

  The minimum occurrence of skipped stretches.
- In order to prevent changes in tension during sewing, the thread must have a uniform diameter.
- A high level of resistance to abrasion is essential due to the friction of the thread in the needle eye and with other mechanisms.
- The thread has to have sufficient surface smoothness to pass easily through the guides on the machine. This ensures the uniformity of stitch formation.

DURABILITY

The main thread related factors under this heading are:

- The thread has to have sufficient elasticity to withstand the normal pressure imposed on seams during wear. This is particularly important for knitted fabrics because of their inherent extensibility.
- Thread shrinkage should be minimal after the garment has been washed or dry- cleaned be minimal after the garment has been washed or dry cleaned. Seam puckering is often caused by unstable thread.
- It is important that the thread maintains its original color after being subjected to cleaning processes. In particular, this applies to the threads used for top stretching and other decoration purposes such as embroidery.

TWIST DIRECTIONS

Sewing thread is made by twist single yarns together to form a stronger thread. The twisting of thread is made in two directions known as “S” and “Z” twists.

The “Z” type twist (Twisting towards left) is most widely used as it is suitable for most machines some special machines however requires “S” type twist.

The threads are wound and packed to form a variety of tubular or conical shapes. The purpose of these is to allow the thread to leave from the “COP”,”CONE”, “VICONE” etc, easily without applying any tension to the thread.

The thread cop label has the following details

- The brand name of the manufacturer
- Color code number of name of the color
- Thread contents meter wise or yard wise
- Number of plied thread- details
- Strength of the thread.
- Maximum retail price

- Type of thread.

The following types have been offered for leather garments.

Mercerized cotton:

Approximately 10% stronger than normal cotton and probably the most widely used for the leather garments.

Nylon:

It main advantage is greater tensile strength permitting a finer thread and finer needle, for seam of the strength.

Nylon / Cotton:

Smooth running and soft.

Polyester / Cotton:

Superior in strength to cotton. The cotton covering provides improved flow through the needle, reduced cutting of the leather by the polyester and also protects the stretches during heat treatments.

In an extensive series of tests, the polyester / cotton threads gave the best overall performance with request to seam strength both initially and after various ageing tests. Cotton suffered considerable losses in strength on artificial ageing and storage.

Relation between needle, thread &material

Thread Thickness TKT NO.	Light Material		Medium to heavy Material	
	Needle Size		Needle Size	
	NM	SIZE	NM	SIZE
80	65-70	9-10	70-80	10-12
60	80-90	12-14	90-100	14-16
40	90-100	14-16	100-110	16-18
30	110-120	18-19	120-130	19-21
35	110-120	18-19	120-130	19-21
20	120-130	19-21	130-140	21-22
25	130-140	21-22	140-160	22-23
15	130-140	22-22	140-160	22-23
10	140-160	22-23	160-180	23-24
8	160-170	23-24	180-200	24-25

ADHESIVE:

Adhesives are primarily used for two purposes. They can firstly be used as a temporary bond holding components for subsequent sewing and secondly for gluing hems or laminating components where the bond is accepted to the permanent.

Problems arise in wear if the adhesive degrades and migrates to the outer surface. In dry-cleaning the adhesive can be softened resulting in partial, temporary loss of adhesion followed by movement of the glued Components sand finally re-adhesion, followed by movement of the glued components and finally re-adhesion in an undesired location.

Adhesives based on natural latex have given rise to a considerable number of individual complaints. They are very convenient to use in manufacture and have been used widely in the past because of their instant tack, ease of removal for unwanted areas and wash ability or brushes. However, certain leather dyes, heat and general oxidation have all resulted in break-down of this type of adhesive with consequent migration through the leather. Their use is not recommended.

Most problems have, however, been caused by the use of adhesive in closed seams. Partial solubility during dry-cleaning has resulted in the adhesive oozing out of stitch holes and being "printed" on to other areas of the same garment or contaminating other garments with which the glue seams come into contact.

The general principle in gluing is to use the minimum quantity required for the purpose and to choose and adhesive which is resistant to constituents of the leather such as dyes and fat liquors and the maintenance treatment of the garment. See table for a list of suitable adhesives.

Adhesive	**Comment**
Water based adhesives Natural rubber lattices	Not recommended
Colle OB	Unsuitable for washable garments, Suitable for dry-cleanable garments.
Solvent based adhesives I part adhesives requiring no mixing before use: Bostik clear Evostick 5004	Suitable for garments to be washed or dry-cleaned

2.9 TOOLS USED IN LEATHER PRODUCT MANUFACTURING:

A good craftswoman is always most particular in her choice of tools & equipment. She will be capable of her best work only if they are good & to use. However, a short description of different tools for leather product manufacturing are given bellow-

1. **Knife:**

Knives are the most important tools. There are many types knife like survel knife, xacto knife utility knife, and shoe making knife. It has a slightly takired blade finishing with a pointed end, generally with a wooden handle.

2. **Skiving knife:**

For skiving edge of leather using this tool requires. Skill & experience can be also done more easily with a skiving machine.

3. **Creaser**:

It is steel tools for finishing the outer edge leather goods. It compresses the leather, giving it a slightly darker and shiny line. It is in different sizes & design.

4. **Oil stone:**

Oil stone is made by carbonandum or silicon carbide. It is used to remove the wire edge formed in the cutting knife. It is also two sides soft & rough. To get fine cutting edge rub the knife on the soft side of the oilstone.

5. **Leather shears:**

These are used for cutting leather of any thickness.

6. **Edge beveller:**

For cutting away a portion of the edge of heavy leather, it is used.

7. Revolving punches:

The revolving punch has a magazine of punches of different diameter. It is used to make holes close to the edge of the fabric.

8. Awl:

It is used for sewing leather in order to make leather goods. They are known by different names diamond, harness or bucking awls. It is used to making hole in leather.

9. Hammer:

It is used for hammering. There are much kind of hammer such as heavy hammer, light hammer & medium hammer. Hammer for leather worker are of two types. Generally the are used for nailing pounding & creasing.

10. Square scale:

For measuring a straight edge for trimming & for measuring & 90 degree angle, it ma be used.

11. Stitch marker:

It is important tool for making leather goods. It is necessary to the leather. Available in several size or with removable. Wheel number on the wheel means quality of stitches per inch, the higher the number, the smaller stitch length.

12. Folding hammer:

These are used for hammering after cementing & stitching. Also when folding gusset heavy leather not to be used for punching.

13. Bone folder:

Made of wood or bone used when turning edges over. Also used when pattern making.

14. Springer divider:

Used in designing department for measuring various allowances of patterns.

15. Thickness gauge:

Used for same purpose as thickness gauge.

16. Sharpening stone:

Used for sharpening various kinds of knives in the various leather goods manufactures.

17. Scissors:

Used by the closing room workers for trimming thread ends, cutting slots & for other similar works.

18. Cutting knife:

Generally used for cutting leather of heavy type.

19. Wooden mallet rubberized:

Used for hammering the punches wherever hand punches is used.

2.10 Types of construction

In the manufacture of leather goods, there are different types of construction to be used, according to the need of the market & orders from customer. These are:

1. Cut Edge Construction.
2. Folder Edge Construction.
3. Butted Edge construction.
4. Stitch & turn Edge/Piping edge construction.
5. Mixed Edge construction.
6. Thong Edge Construction.
7. Molded Edge Construction.
8. Binding Edge Construction.

1) Cut Edge Construction:

All components of the leather goods are assembled without any folding on the edge. So that outer edge are absolutely level when stitched. For this type of construction work mostly vegetable tanned leather of good quality finish with firm close texture is preferred. Because of it is raw edge after finishing, the edge are visible as raw cut. To impart a good finish to these articles all the edges are attained by similar color, polished & creased.

2) Folded Edge Construction:

This term refers to all articles whose components are cut with additional margins, which may be skived if it is necessary. Then the margin applied with an adhesive & turned or folded over on to the lining or other inner parts to cover the edges. Then they are secured by stitching as any construction. This method of construction, impart a greater durability & neatness to the article.

3) Butted Edge Construction:

In butted edge construction two turned over (Folded) edge are placed together by keeping the grain side out & stitched. Mostly, products such as document case & shopping bags are produced by such type of constructions. It gives a double later of folded edge on all round the edge.

4) **Stitch & turn Edge / Piping edge Construction:**

In this case grain-to-grain side is stitch & the joined parts are subsequently turned inside out to bring the grain face of leather outside. Mostly it has a piping cord on its finishing round the body of the bag, and also made without any internal stiffening of reinforcement, paper or paper board being incorporated. This class is known as lip leather goods. Some time linings are assembled separately & attached with the bag at the top of part (Drop in lining); it is flexible just as the leather & lining material forming the article.

5) **Mixed Edge Construction:**

This type product is, produced by mixing of folded edge & raw edge constructions in the final assembly. As some of the product such as ladies bag, shopping bag, document case & other products are products are produced.

6) Thong edge construction:

Mostly we are using on the craft work of production. In thong edge construction the edge of the good are, webbed by similar strips of leather. Thong edge construction is made through direct punch slots or, holes, to stitch (close) the bag by means of leather lace (leather thong).This adds beauty to the bag.

7) Molded Edge Construction:

This type of construction is related to the covering of rigid foundation to makes articles such as jewel case, Attache case, Suit case, Cigar case etc. To fabricate these articles, frames or boxes of required Size & shape, which are made from various kinds of woods, plastics or light sheet metals are used. They are then, covered by panel of leather pieces with appropriate joints & fixtures. The leather has to be split uniformly & skived for joints wherever necessary. They are fixed by applying good & strong adhesives.

8) Binding Edge Construction:

These are type of construction, which gives the list & decorative finish of the product. After assembling of all components as raw edge construction, to cover the edges of the product & at the same time to give decorative effect some product we have to bind in same or different color of strip leather. There are three types of binding edge construction.

a) French Binding:

The binding, which is stitched one edge of strip with outer edge of product and turned over the binding to the inner part and stitched again.

b) English Binding:

Simply by attaching the binding at the edge of the product and stitch.

After stitching of each binding some times if it is necessary we have to trim the excess of the binding.

MOULDED ARTICLES

The moulded is articles are used to protect glassware, flask etc. Only vegetable tanned leather moulded to desired shape and they only retain the moulded shape. Vegetable tanned leathers of even thickness are wetted and wrapped round the mould of desired shape of an article and allowed to dry completely.

Chapter- 3

UNIT OPERATION

Manufacture of leather goods consists of a multitude of different operations. Some of them are essential for all types of manufacturing process & some may be skipped depending on the design & types of

Construction:

It is absolutely necessary to know following sequences of operations involved in the manufacturing of leather goods. These are,

1. Designing & pattern cutting.
2. Cutting.
3. Pre-Assembling & Assembling.
4. Finishing & packing.

1) DESIGNING & PATTERN CUTTING

Designing:

Designing is an important process in the manufacture of leather goods. In the principle of designing, a good design should be easy for fabrication and saleable.

The design should be simple when it is covered in to production as much as possible, because production & productivity are the sky factors for successful commercial venture. Assembling of too many components for multi-purpose functions must be avoided as much as possible. It affects the important aspects of designing namely, size, shape, structure attraction & value appearance. In good designing, techniques & technical skills very important. A good design should not impart the functions of the products for which they are manufactured.

For example, a document case can hold documents & serve for its intended functions. Without intended function, any leather goods added decorations to enhance the rich appearance of the article will be of no use.

A good designer must have creative & hi-tech skills to product to international standards. He has to foresee the fashion trends & frequent change of styles & designs. He must be aware of the quality of the materials, color mat5ching, texture, feel etc.. & the quality of other fittings such as accessories, decorations, fittings, etc… in fact, the designer stands between the market & the manufacturer.

Pattern Cutting:

In leather goods productions the most important operation next to designing is pattern cutting.

The pattern maker (pattern cutter) next to designer should have sound knowledge about the design chosen, various materials & tools that are to be used & different types of construction that are contemplated.

According to the type of construction the pattern & its size vary, & allowances to be provided are different. In each pattern, allowance for seam & turnover to be provided are different. In each pattern, allowances for lining, foam & other reinforcements. It is always the practice to have distinct marking in the patterns itself for fixing of the accessories, attaching of thick & strong hard boards, most of the time to make number of production, hard board patterns are fixed into aluminum or galvanized metal piping around the edge or completely made on them (Aluminum, Zinc, etc..) these are known as templates in technical parlance.

In leather goods making there are three kinds of pattern are used. Normally,

a. Basic pattern
b. Making pattern
c. Cutting pattern

a) Basic pattern:

Basic pattern is plan, which is an ideal of designer demonstrated. Only from this pattern the making pattern is developed. The size & shape of & product are determined by basic pattern.

b) Making pattern:

The pattern which are cut to be correct size & shapes of components of leather goods product are called making patterns. Making pattern is some times called working pattern. The main purpose of these pattern are to help in the product of cutting patterns, & also in the production process to help the bench work operation for further makings of place of folding, place of button fixing, & any other making. These patterns are largely used for making cut edge construction types of product to cut leather components.

c) Cutting Pattern:

The pattern which is cut with allowance, for folding, over lapping (seam), stitching etc… of the making pattern, a set of cutting pattern made generally. Pattern for reinforce materials or stiffening materials, & pattern for padding (foam). As mentioned above, in simple, in simple cut edge construction cutting pattern are one & the same.

A good pattern maker must be aware of different types of finished leather, & their suitability in making different types of leather goods, he must be well versed with the technology & technique of fabrication & types of constructions. He must have the essential knowledge in elementary mathematics, reading of measuring scales, & use of geometrical instruments for drawing geometrical shapes such as rectangle, triangle, square, circle, parallelogram & other odd shape. He must have knowledge about different types of fitting & accessories, linings & reinforcement materials, which are used in leather goods making.

The pattern maker must give in each pattern the following information, which would help the cutter to cut materials easily & accurately.

a) Model number/code number of the product,
b) Name of the pattern/back, front, gusset, pocket, handle, etc.
c) Number of components to be cut,
d) Name of the raw material/leather, lining, foam, etc…/
e) Center point for perfect joining of the components,
f) Marks or slots for fixing fittings, accessories, decorations, zip, etc,
g) Good components, defective components, partly good & partly defective component (that is the visual part must part must have good surface, & invisible parts has defective surface).

1) CUTTING:

Selection of leather

The raw material for leather goods production is obtained from processed or semi-processed hides & skins. These raw materials (finished leather) are dependent on the ever- fluctuating price & demand of the meat industry. In addition, the raw material is highly heterogeneous in nature. Each hide or skin very in structure & chemical compositions, quality from the, species to species, & within the skin or hide. Hence it poses a greater challenge to the technologists in selection of good quality finished leather for particular type of leather goods.

Important operation in the fabrication of leather goods is the cutting department. In a factory it should be mannered by experts & highly skilled personnel's as the very nature of finished article depends on the method of cutting room techniques. Awareness has to be created on the sound principles of cutting room practice. It is always born in mind that the whole costing of leather goods depends on the way of cutting patterns in the cutting department, since saving leather means saving in cost of production.

For successful cutting, the cutter must be aware of sections & quality variations of skin.

- **BUTT**

But is the best part of the leather (hide/skin). It has a uniform grain structure & usually of good color. Mostly the front panel (visible part of the articles) cut from butt.

- **SHOULDER**

This point portion of leather is the second best with the substance thinner than the butt. It may contain growth marks but it is firm & tight.

- **NECK**

The neck is the third in quality. It may be thicker, but has a lose grain & is poor in strength & may large growth marks, particularly in the case of hides.

- **BELLY**

Belly is thin has lose in fibrous structure. It is poor quality. Mostly this part of leather is used in the hidden part of the articles.

- **SHANK**

Shank many vary according to the skin. They are usually the weak part. Science, they are stretchy with winkles, they may not be used accordingly to its quality.

- **OFFAL'S**

They are very pliable & stretching & hence they are not normally used. The back- bone area may be quite pronounced, especially in the case of goat & cutter avoids it. A cutter plays a vital role in leather goods making & he is considered to be an important person after designer & pattern maker.

A good cutter must be well versed with the following:

- Part of the hide/skin & their suitable for cutting of components of the products
- Type of leather & their suitability for making different types of the leather goods.
- Identification of common defects & stretch of leather.
- Assortment of leather for various thicknesses & their suitability for various component of the product.
- Before proceeding to cutting operation, the suitability of that particular leather for the available order of production has been light & space to see the entire area of each leather surface. The selection process is done by visual examination, mainly concerned with aesthetic value of leather. This includes examination of properties such as smoothness of grain matching through out the batch, color matching, softness, fullness, feel, dyeing & any other defects.

STRETCH

Stretch of leather is more on the direction when the animal grows as shown in the arrow.

Majority of leather goods retain their shape due to the reinforcement they have. Therefore, the stretch of the leather is not that much of importance & it would not spoil the appearance of the leather is not that much of important & it would be not spoil the appearance of the article. The best part of articles demands the best part of hides & skins.

GRAIN MATCHING

Most of the time the panel of leather goods is sectioned. In this case the gain of each component should be matched; otherwise the articles will appear odd & doesn't have good appearance.

Matching grain is important factor, particularly for the high grade articles proper consideration of grain matching is necessary. Of course for minimization of

wastage & cost reduction some times grain matching has been difficult, but in all articles the front panel of articles is usually have well matched grain pattern.

COLOR MATCHING

In aniline dye batch, the leather should have to be matched for shade & articles components of the articles have to cut from the matched grain of same shade.

In case of pigment finished leather the defects would have been covered due to a thick color coating. In this case, especially the backbone area is measured & any mark is visible, it is not advisable to use these portions in the front panel of the article.

COMMON DEFECTS

A cutter / selector must examine each hide or skin both on the grain side & flesh side for defects. Before cutting operation begins the following defect has to be marked.

1. Deep flesh cut
2. Bad grain
3. Uneven grain
4. Glazing fold
5. Color variation
6. Excessive stretch

Cutting is considered to be one of the most important operations in the manufacture of leather goods operation. Cutting is the term used for cutting leather components, lining, foam & other reinforcement materials using for production of leather goods.

The essential operation involved in cutting room are done by the two methods

1. By manual
2. By machine

MANUAL WORK IN CUTTING ROOM:

In olden days all the operation of leather goods has been done manually. Today because of high demands & modern practice of these articles, machinery work becomes essential.

In small – scale industries, cutting operations had been done manually and also in some rural area on addition to hand cutting, skiving operation is also done operation is also done manually.

HAND CUTTING:

Hand cutting is done usually in small leather goods industries using either cardboard pattern or metal templates. Hand cutting is done on an inclined wooden table fitted with a galvanized iron sheet or zinc sheet on the top. Hand cutting is done by a sharp hacksaw blade knife made of 1.2cm which and about 30 cm length or other fabricated adjustable hand knife. In the case of hacksaw blade knife, it is essential to rub with emery stone whenever the knife becomes blunt to make it shape and pointed. Basically the pattern is placed on the required position of the material and the shape cut all- round with a cutting knife. Good shape and pointed cutting tool is essential for successful work.

KEY POINTS TO BE REMEMBERED DURING CUTTING:

1. Make sure that it is the correct pattern of the article you desired to cut,
2. Examine for defects, size and shape of hides/ skins,
3. Selective cutting must be practiced; the best part of the article demands the best part of hide/skin.
4. Visible parts should have good grain surface and section covered could contain grain defect,
5. Good cutting begins with a sharp knife. Less sharpened knife or blunt knife cuts the leather with ragged edge,
6. The angle between the edge of the knife and the cutting board depends up on the very soft materials like fabric and a greater angle for hard materials like leather and reinforcement may be used,
7. Over cutting and under cutting must be avoided.

8. Patterns must be placed in such a way to ensure quality, economy and minimum wastage.
9. Straight- line cuttings must be done first with steel scale/ruler. Curved line cuttings or irregular shapes must be cut with templates,
10. Cutting must be done on a smooth surface of soft wood or plywood or galvanized iron plate or zinc plate for accurate cutting.
11. Pattern must be placed on the leather and initialize cutting from left to right.
12. Start cutting from left top corner of the pattern and at the right bottom corner,

CUTTING DIRECTION

1. Use the least number of cutting strokes,
2. Cut through the leather in one stroke

3. Assembling:

After pre-assembling (preparation) process is done, the next step is assembling various individual to get structure of articles. To assemble this component before cementing of edges that are folded at the stage of preparation, a grain part of fold edge are properly scratched to ensure bonding strength of adhesive and then is applied adhesives gently. Applying of adhesive on unnecessary part of component affects cost, time and quality of production. After a while component affects cost, time and quality of production. After a while components stack together and hammered gently and transferred to stitching operation.

Stitching:

Stitching is the most important operation that decides the quality of the end products. So, stitching is tested on a waste piece of leather before stitching on the product.

Basically in shoulder bag production Flat bed, Post bed and Cylinder bed sewing machine is used.

To stitch this type of heavy goods, we have to use Heavy duty machines.

Flat bed sewing machines are provided with two needles to make two parallel lock stitch seams and also, flat bed machine is provided with a zigzag stitching operation for decoration.

Stitching length- 3 st/cm

Stitch gauge - 3m.m from the edge.

4. FINISHING AND PACKING

THREAD BURNING

After stitching, the articles are checked carefully. Excess thread is removed either by trimming with a scissor or soldering in case of nylon thread. Thread burning is done carefully in case the soldering stick damages the stitch of the articles.

TRIMMING

At the stage of finishing some product, which is produced by fold, edge construction and binding edge construction may have excess material (leather) on the edge of articles. In this case edge trimming is done by using sharp knifes. Highly skilled persons should do trimming in case it damages the whole product become waste.

COLOURING

Trimmed edges and any part of articles that needs color are colored by hand or edge coloring machine. As mentioned in pre-assembly stage, coloring is done carefully and after coloring excess paints are cleaned immediately.

CREASING

Creasing operation is applied in shoulder bag for decoration. This operation is done by hand or in case of bulk production it has to be done by universal stamping (creasing) machine.

FINAL INSPECTION

Before the articles are sent to packing, strict quality control is observed for

perfection in assembling, stitching, accurate and smooth functioning of fittings. Strict quality control mechanism is observed from the beginning to the end at every stage of operation for producing high quality product.

PACKING

Shoulder bag items, which can be damaged, molded or chapped, must therefore be packed carefully and securely.

POINTS TO BE CONSIDERING WHILE PACKING

- Do not fill the boxes just with the product, but pack a number of similar items in smaller box, or use some cardboard layers.
- Carefully indicate which products and in which quality is packed in each box, so that it won't be a mystery to the importer.
- Before packing, products should be protected by plastic bags in order to avoid damage from rain or moisture.
- Each box should have a packing list, which gives a specification of all products in terms of quality, type color, etc…..

MACHINERIES AND TOOLS USED IN LEATHER GOODS MANUFACTURING

For many years, only sewing was done by machines and rest of the unit operations like clicking, skiving and strap cutting, where done manually for the fabrication of leather goods. Today, like any other industry, leather goods units also use semi automatic and automatic machines for the production of leather goods. These machines help not only to increase the volume production, but also ensure quality of the products.

The leather and other materials undergo various unit operations before being shaped into a product. In large-scale industries, different types of machines do used in leather goods manufacture.

Those machines are mentioned below:

- ❖ Clicking Machine
- ❖ Splitting Machine

- ❖ Skiving Machine
- ❖ Sewing Machine
- ❖ Platting/ Embossing
- ❖ Strap Cutting Machine

1. Clicking Machine

The sequence of operations to fabricate an article begins with the clicking machine. Different panels or components of a leather goods product are cut in this machine. Here, après knife is used which is in the shape of patterns. So a set of dies is required for each article. The leather is placed one by one on the cutting Teflon board of the machine and cutting dies with the shape of component is placed on leather and by clicking.

On an average of 300 components can be cut in an hour. This machine could be either mechanical or hydraulic operation. According to the size of patterns and dies we have to use different machines, which have different bed area and pressing power. The cutting dies are fabricated using the patterns of different components viz. Front, Back Flap Gusset Base, and so on. The cutting knife is fabricated from steel, with thickness depends upon the components size to be cut.

The press knife (dies) should be,

- Sharp edge in order to give a clean edge cut
- kept separately and not stacked one over the other
- Stored and handled to ensure that fine edges are not damaged.

2. Splitting machine

Spitting is the second machine operation after cutting. Leather that is available for leather goods productions are mostly founds to thicker than the requirement. Splitting enables reduction of thickness of thickness of the leather components to the required degree that helps early in assembling of components. Excepting heavy leather goods, medium and small leather goods require leather components of thickness less than 1.00mm. so, splitting is necessary for the leather that is obtained from the market having thickness of 1.2mm and more. The slitting can be done to a

thickness that can be obtained in 0.5mm using a presser roller and 0.2mm using a presser bar. The top grain layer is used in the fabrication while the bottom-split layer is left off.

3. Skiving

The third unit operation inside cutting room skiving. The terms skiving means decreasing or reducing the substance at the edge of the components of leather mostly at the flesh side.

Object of skiving:

1. To improve the appearance of final product.
2. To avoid discomfort in wear/use.
3. To reduce the bulkiness.

Classification of skiving:-

There are four types of skiving. They are-

1. Edge skiving
2. Dart skiving
3. Bevel skiving
4. Groove skiving

1. Edge skiving: -

This is thinning down on the double width of the required edge. By adjusting the pressure foot adjusting screw to required depth of skiving, fine edge skiving is obtained. Fine edge skiving is done in most of the articles.

2. Dart skiving:-

It is also called the parallel skiving. Narrow thinning down some of the thickness of the edge. The substance is removed parallel with uniform thickness. The skiving is continued till the end of the component in reached. Parallel skiving is used in turn over works.

3. Bevel skiving:-

Thinning down of variable thickness. By adjusting the pressure foot and the feed roller at the suitable angle, bevel skiving is obtained. Third type of skiving is used in the fabrication of brief case, jewelry boxes, cosmetic boxes, suitcases, etc…

4. Groove skiving:-

Groove on the middle of the component for folding without decreasing the substance of folded part. For this type of skiving special tracer foot is required.

4. Sewing Machine:

This is a very important machine as the assembled components are permanently joined together by stitching. Quality of stitch is an important factor and it adds aesthetic value to the end product. Wide ranges of sewing machines with different attachments are available. The main classes of sewing machines are flat bed, cylinder bed, and post bed and under each class, different types are available to suit the requirements of the users.

5. Platting/embossing:

Platting is done in hydraulic press by which has a polished plate that can be heated to the desired temperature. Platting is necessary for some components, which have, fold marks to give perfect appearance to the cut components. By changing the plate different designs can be embossed on the components.

6. Strap cutting machine

Strap for belt production, are cut using strap cutting machine. The machine is fitted with circular disc knife with spacers in between them. The width between knifes can be adjusted using suitable spacers.

7. OTHER SIMPLE MACHINE

Apart from the above important and essential machines, the following machines are used depending upon the design. The are edge coating, cementing, creasing, folding, frame opening and closing, designing, stamping, eyeleting, reverting, buttoning etc. some of them are simple pedal operated machines.

EVALUATION OF DESIGN AND FASHION TREND IN LEATHER GOODS

Before dealing with the concept of design in detail, a broad outline of what have originated before the advent of design in dealt with, it started first with the purpose of utility. During the pre-historic times, man was exposed to a lot of natural hostile forces from the environment such as cold, heat and rain. Initially, he started using large leaves to cover himself and palm leaves to protect his feet but when demand for these increased, he looked for alternatives with a longer durability.

Then started the emergency of using the skin of animals. As he hunted for his food, he discovered a number of applications of the skin including protecting himself the elements.

Hence, from the crude utility stage, it moved, in the later stages to a higher level of designing. Design took different from another, to differentiate life styles, occupation and so on. As civilization progressed, simultaneously population grew and demand also increased. Market paved its way to competition. Competitions vied with one other and it was them that DESIGN took stronger roots. Design plays a major role in a number of fields. It is not limited and has application in diverse fields like architecture, scientific equipment etc.

A study of design in the leather industry would show that of late there has been a dramatic change. A number of design schools have been started to meet the growing demands of the trade. The designer’s words are exhibited in fairs

organized by the leather industry. It goes into the various attributes and a jury is formed to evaluate the displayed designs. The displayed designs are then awarded a ranking. It is then selected for a period of two years to be the fashion. Designs are selected two years in advanced before coming into market.

In the western countries fashion charges twice a year, due to their climatic conditions. Hence, we find that winter wear has its own fashion vary different from that of summer. Here we also find that purpose power is vary high and hence we find there are designers like Pierie Cardin, J. C. Penny and so on who bring out a total range of wear consisting of clothes to footwear, together with leather accessories.

Clothes and footwear change are attributed to formal occasions, such as an informal party dress to a formal dinner wear. Colors also play a very vital role in fashion trend. When a particular design is selected by the jury, rights are granted to the manufacture for production which finally comes to the market, it is at this stage, it is seen whether the level of acceptance by the public is high, which in turn determined by the sales and successful it becomes a trend of that time.

The foregoing indicated market that pertains to the western countries. There is a complete absence of these trends in a developing country like India. Only now there exists a very marginal awareness of design in the minds of the younger generation. With the advent of multinationals among the major business houses, there seems to be a positive outlook even though it might not be as successful as their western counterpart.

DESIGN AND PATTERN DEVELOPMENT

In the processing and marketing of leather goods, design & development (pattern development is the off – shoot of design & development) is of utmost importance. Without proper conception or grasp of functional value, no design could converted into a fabricated product and such as the work relating to the

design and pattern development aspect of leather goods manufacture cannot be over emphasized.

In the first instance, a design should be as simple as possible and easily workable and saleable. The function of the design should be crystal clear before pattern making. Multipurpose functions (end use) with too many components joined or assembled should be avoided to the extent possible, as it cuts into other important aspects of the design namely size, a9apprave, shape and aesthetic value. A compromise or judicious or imaginative blend of elegance and performance, quite in harmony with the function use is suggested for the best creative designs.

As the sole intention of design is to meet the requirements of its basic functions, its performance could be better built around its generic character rather than its additive character. A good leather goods designer has to foresee the fashion trend / change and style in the coming seasons usually a year ahead and form an idea of what things are in store for the market. In fact, designer stands between the market and the manufacture. He is the creator of fashions and fashioner of creations. Some of the important factors are color matching, texture, feel embellishments and son on but the most important parameter being the functional value.

Another important aspect of design and pattern development is that the design should be easily translated or transformed into production schedule. Further productions and productivity are the key factors for a successful commercial venture. That is why it has been advocated that too many components have to be avoided. For instance, from the author’s experience, a wallet could be made out of one single components of leather in less that three minutes, here the design and pattern making of the wallet plays a stellar role, but the consumptions of leather in pattern cutting is high but the compensated with the case of operation and the productivity is very high in this case. On the other hand, the same wallet could be made with 5 or 6 components assembled together. Here we care saving leather, but production schedule is long and productivity slows down within its ambits. So in design and development of leather goods (the above is only in illustration to drive home the point) a judicious blend of production technique and productivity, cost

saving, value addition and quality control aspects should be taken into consideration.

The pattern maker, next to the designer should have sound knowledge about the design chosen, the various materials of construction that are to be used and the different. In each pattern, allowances for seam and turnover are to be provided. The pattern size caries for leather, lining, foam and reinforcements. It is always the practice to have distinct markings in the patterns it for button holes and other fasteners. Normally the patterns are made of thick strong paperboard with metallic piping around the edges or made of metal like aluminum and zinc. These are known as templates in technical parlance. The individual patterns of an article are numbered and kept together and stored properly for easy identification and reproduction at a later stage.

Undoubtedly, pattern cutting is an art, but it is scientific in the sense that it required elementary mathematics and geometry as symmetrical (sometimes odd) shapes of pattern are to be fitted in the area of leather judiciously to get the maximum advantage of cutting. The art of pattern cutting requires anticipation, sound judgment, and cultivated style of approach with a sense of quality control.

After going through the scientific system of designing pattern development, one feels inclined that the principles of designing are based purely on mathematical calculations and geometrical drawings.

In the beginning, it is so; angle, degrees, dividers, set squares is necessary. But by identifying one self within such limits, one cannot become a perfect pattern marker. Experience, practical knowledge and keen observation are the ingredients to become efficient to give perfect, vital shape to the patterns and this requires training.

QUALITY CONTROL:

DEFINITION OF QUALITY:

The word quality has multiple meanings. Two of those meanings dominate the used of the word:

1. Quality consists of those product features, which meet needs of customers and thereby provide product satisfaction.
2. Quality consists of freedom deficiency.

To explain these dominate meanings it is first necessary to define the key words.

PRODUCT:

"Product "is the output of any process. It consists mainly of goods, software, and services. "Goods" are physical things: pencil, color television sets, office buildings. "Software" has more than one meaning. A major meaning is instruction programs for computers. Another major meaning is information generally: reports, plans, instruction, advice, commands. "Service" is work performed for someone else. Entire industries are established to provide services in such forms as central energy, transportation, communication, entertainment, etc.

PRODUCT FEATURE:

A "Product feature" is a property, which is possessed by a product, and which is intended to meet certain customer's needs. Product features may be technological in nature, e.g., fuel consumption of a vehicle, dimension of a mechanical component, viscosity of a chemical, uniformity of the voltage of an electric power supply. Product features may also take other forms, e.g.. Promptness of delivery, ease of maintaine, courtesy of service.

CUSTOMER:

A customer is someone who is impacted by the product . Customers may be external or internal.

A. EXTERNAL CUSTOMER:

These are impacted by the product but are not members of the company which produces the product. External customers included clients who by the product, government regulatory body, the public, etc

B. INTERNAL CUSTOMER:

Within any company there are numerous situations in which departments and persons supply products to each other. The recipients are often called "customers" despite the fact that they are not customers, in the dictionary sense, i.e., they are not clients.

CUSTOMER NEEDS:

All customers have needs to meet, and the product features should be responsive to those needs. This applies both external and eternal customers. In the case of external customers, the response determines product satisfaction, and in sequence, product salability. In the case of eternal customers, have the response determines the company's competitiveness in productivity, quality, etc. as well as the morale among internal departments.

PRODUCT SATISFACTION:

Product feature, which do response to customer needs, are said to provide "Product satisfaction" a state of affaires, which is decisive as to salability of the product. The competitive markets there are multiple suppliers of the product features. The resulting variation leads to degrees of product satisfaction and to associate differences in market share for the respective suppliers.

GRADE:

A popular name for degrees of product satisfaction is "grade". Some times called "quality of design". Products whose features are perceived as meeting customer needs to a superior degree are called "higher grade" products. Sometimes these grades are established formally, as in hotel services or cuts of meats.

QUALITY PLANNING:

This is the activity of developing the products and process required to meet customers' needs. It involves a service of universal steps:

1. Determine who the customers are.
2. Determine the needs of the customers.
3. Develop product feature, which respond to customers needs.
4. Develop processes, which are able to produce those product features.
5. Transfer the resulting plans to the operation.

For an elaboration of the quality planning process:

QUALITY CONTROL:

This is too used by the operating forces as an aid to meeting the product and process goals. It is based on the feedback loop, and consists of the following steps:

1. Evaluate the actual operating performance.
2. Compare actual performance to goals.
3. Act on the difference.

QUALITY IMPROVEMENT:

The third member of the quality trilogy aims to attain levels of performance, which are un precedent –levels which are significantly better than any past levels.

To improve the quality planning process requires several major changes:

1. A revision in priorities so that the planners are given enough and resources to do a more thorough job quality planning.
2. A more structure approach to quality planning, company wide planning for quality.
3. A broader database for quality planners, derived from "lessons learned", i.e., feedback from problems encountered and solved during the control process

and especially during the improvement process. The concept of “lessons learned”.

Fitness for use:

It would be most convenient to have some short phrase which is universally accepted as a comprehensive definition of quality, i.e., so that it includes the products features which leads to product satisfaction, and in addition includes free from deficiency. Various such phrases have been proposed by parishioners none has achieved universal acceptance.

PRODUCT FEATURES AND QUALITY CHARACTERISTICS:

Human needs are extremely divers, and this has lead to a corresponding proliferation of product features and quality characteristics. This proliferation extends to multiple human displayers. As the following example:

Technological: Hardness, inductance, acidity, etc.
Psychological: Tasse, beauty, statues, etc.
Time- oriented: Reliability, maintainability, etc.
Contractual: Guarantee provision, etc.
Ethical: Courtesy of sales personnel, honesty of service shops, etc.

PARAMETERS OF FITNEES FOR USE:

Beyond those product features which bear directly on product satisfaction there are additional aspects of the product, which also contribute to fitness for use. These additional aspects are often called “parameters’ of quality. An example is the time related “abilities”.

For products which are consumed promptly fitness for use is determine by (1) the adequacy of the product design and (2) the extend to which the product originally conforms to that design. For long-lived product, some new time oriented

factors come into play: availability, reliability and maintainability. These abilities are closely interrelated and vital to fitness for use.

CUSTOMER INFLUENCE ON QUALITY:

Aspect of the problem	Original equipment manufactures	Dealers and repair shops	Consumers
Makeup of the market	A few very large customers	Some large customers plus many smaller ones	Very many very small customers
Economic strength of any one customer	Very large and cannot be ignored	Modest of low	Negligible
Technological strength of customer	Very high, has engineers and laboratories	Low or nil	Variable but cannot be very great collectively
Fitness for use is judge mainly by quality specifications	Qualification testing	Absence of consumer complains	Successful usage
Quality specification dominated by	Consumers	Manufacturers	Manufacturer
Collection and analysis of failure data	Good to fair	Poor to nil	Poor to nil

QUALITY AND PRICE:

There is general awareness that product price bears some rational relationship to product quality. However researches on the subject have often reported confused relationships, some of which appear to turn contrary to logical reasoning. To interpret researches it is useful to separate the subject as between consumer products and industrial products.

CONSUMER PRODUCTS:

Numerous researches have tried to quality the correlation between product quality and product price. A major database for the researches has been the Journal consumer Reports, a publication of consumer Union, a nonprofit supplier of information and advice to consumers. The specific information used in the researches consisted of Consumer Reports published quality ratings of products, along with the associated prevailing market prices.

Researchers offer various theories to explain why so many consumers seems to be acting contrary to their own best interests:

1. The quality ratings are based solely on the evaluation of the functional features of the products –the inherent quality of design. The ratings do not evaluate various factors, which are known to influence consumer's behavior. These factors include service in such forms as attention, courtesy, and promptness; also décor in such forms in pleasant surroundings and attractive packaging.
2. Consumers generally possess only limited technological literacy; most are unaware of the quality ratings.
3. Lacking objective quality information, consumers give weight to the image projected by manufactures and merchants through their promotion and advertising.
4. Many consumers as quality ratings perceive the price itself. There appears to be a widespread belief that a higher –price product is also a higher quality product.

QUALITY AND VALUE:

What emerges is that for many consumers, perception of the quality-price relationship is derived from unique interpretation of the terms used:

Quality is interpreted as including factors, which go beyond the inherent functional features of the products.

Price is interpreted as relating to “value” and is paid for those added factors, along with the inherent functional features.

QUALITY AND SHARE OF MARKET:

Once a product is actively on the market it attains some “share of market”, i.e. a proportion of all sales by all suppliers of that type of product. The size of the product attained market share is of great economic importance. Greater market share means higher sales volume. In turn higher sale volume results in disproportionately higher return on investment due to the nature of the breakeven chart.

EFFECT OF QUALITY SUPERIOR:

Quality superiority can usually be translated in to higher share market but it may require special effort to do so. Much depends on the degree of superiority and on the ability of the buyer to perceive the different and its significant.

QUALITY SUPERIORITY OBVIOUS TO THE BUYER:

In such cases the obvious superiority can be translated in to higher share of market. This concept is fully understood by marketers, and they have from time immemorial urged product developers to come up with product, which can then be used to secure higher share of market. Examples of such cases are legion.

Chapter-4

PREPARATION OF DIARY COVER:

Objectives

- To make diary cover
- To developing skills in quality control
- To developing skills in manufacturing according to the developed design

Raw materials & accessories

Leather material : cow hide
Substance: 1 mm
Color: Chocolate & Black

Pattern paper (200 gm)

Foam

Mill board

Tools

- Designing knife
- Scale
- Measuring tape
- Awl
- Cutting knife
- Thickness gauge
- Scissor
- Creasing tools

Machines and Equipments

- Splitting machine
- Skiving machine
- Flat bed sewing machine
- Cylinder bed sewing machine
- Thread (40/3 Z twist)
- Adhesive (Latex)
- Needle

Perspective View:

List of components-

Leather Materials

SL. No	Components	No. of Pieces
01	Outer Top	02
02	Inside right	02
03	Inside left	02
04	Centre Patti	02
06	Top patti	02

Other Materials

SL.No	Materials	No. of Pieces
01	Mill Board	04
02	Foam	04
03	Pattern Paper	01

Cutting Patterns of Components

Outer Leather

SL.No	Component	Exact size in cm	Folding allowance	No. of pieces
01	Outer Top	34.5X22.5	1cm-all sides	02
02	Inside left	14.5X20.2	.7cm- top sides	02
03	Inside right	22.5X13.2	.7cm- left sides	02
04	Centre Patti	14.5X22.5	-	02
05	Top Patti	6X14.5		02

Skiving Instructions:

SL. N0	Component	Side to be skived	Width	Thickness	Type of skiving
01	Outer Top	All sides	10 mm	.05mm	Parallel
03	Inside right	right	10 mm	.05mm	Parallel

Details of leather consumption:

Serial no.	component	Size in cm	Quantity	Area in sq cm
01	Outer Top	34.5X22.5	02	1552.5
02	Inside left	14.5X20.2	02	585.8
03	Inside right	22.5X13.2	02	594
04	Centre patti	14.5X22.5	02	652.5
05	Top patti	6X14.5	02	174

Total pattern area = 3558.8sq cm

=35.588sq.dm

15% Wastage =5.3382sq.dm

Total Leather Consumption = 40.926sq.dm

= 4.405 sq ft

Here,

1 sq dm = 100 sq cm

1 sq ft = 9.29 sq dcm

PATTERN CLASSIFICATION

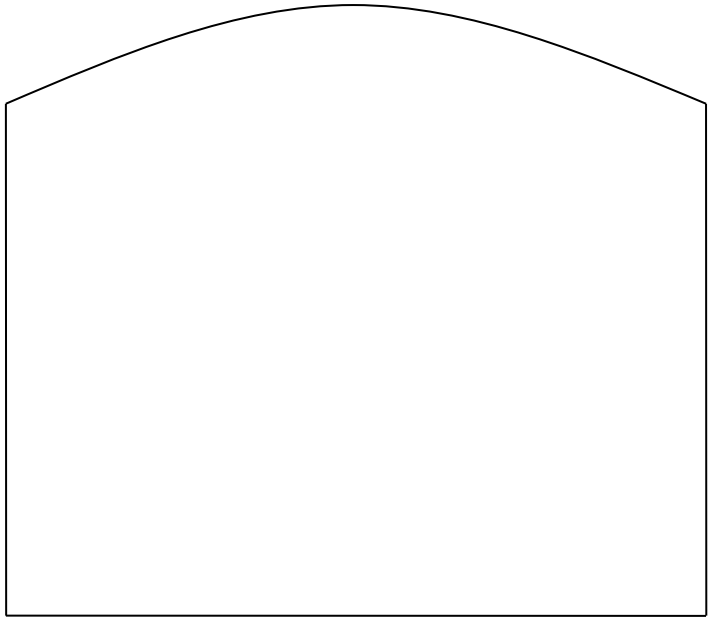


Fig: Outer Top Part 1 X 1pcs

(For sample-1)

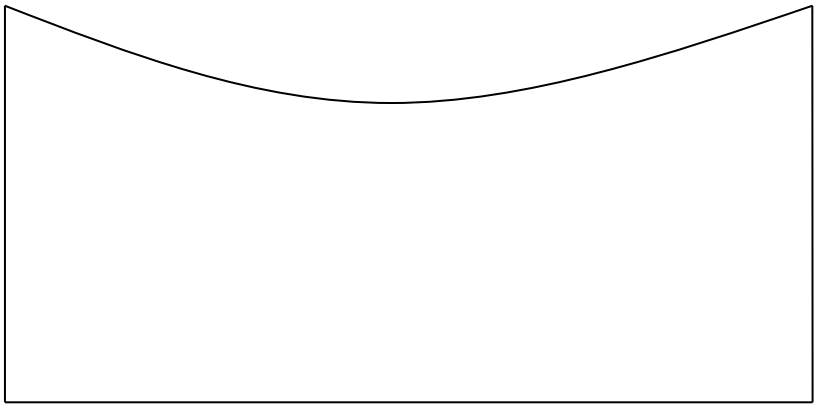
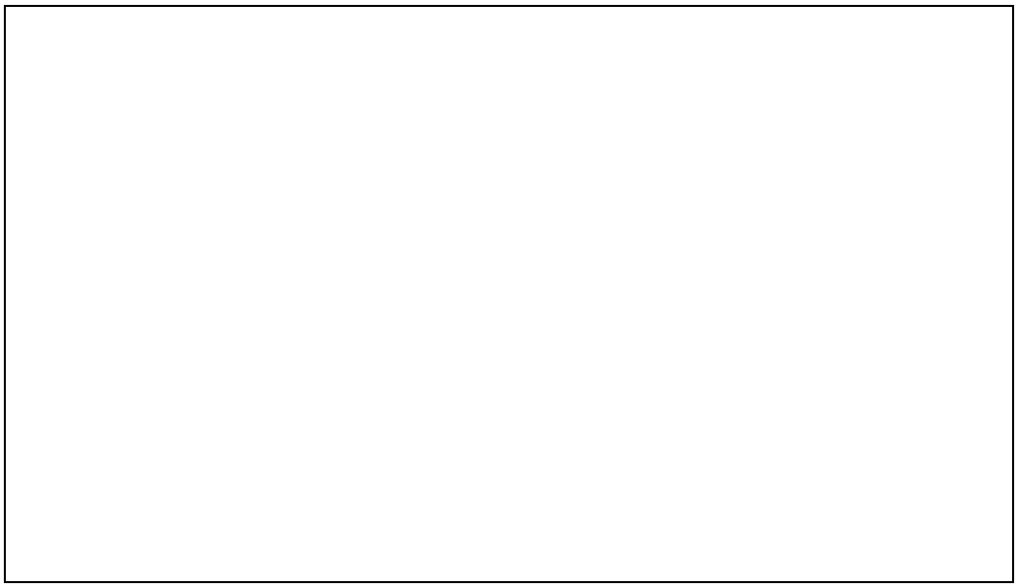


Fig: Outer Top Part X 1pcs

(Foe sample- 1)



Outer top part X1pcs.

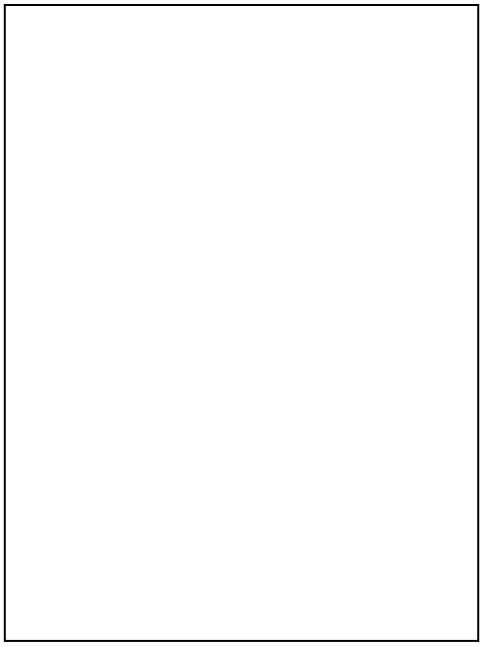


Fig: Outer Top X 2

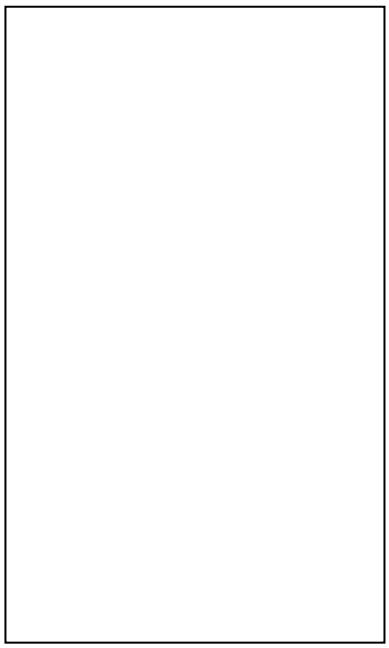


Fig: Inside Left X 2pcs

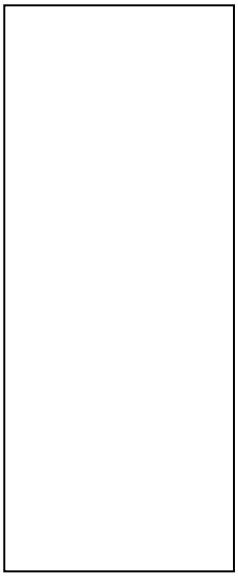


Fig: Inside Right X 2pcs

Fig.: Top Patti X2pcs

Final Product

PRODUCT- 1

INNER VIEW

OUTER VIEW

PRODUCT- 2

INNER VIEW

OUTER VIEW

Making operation

Cutting:

Cut all components Outer front decoration leather, lining and reinforcement as per cutting patterns.

Skiving:

Skiving is also done according to skiving instructions.

ASSEMBLING STITCHING:

1. Place the pattern on the flesh side of the leather.
2. Trace the pattern and cut out.
3. Skive four sides of the front part and side part where necessary.
4. Apply adhesive on the flesh side of the front & side part where necessary.
5. Fold them properly.
6. Join three side of the front & side part
7. Then stitch.

Sewing Instruction:

Thread -	Polyester
Needle -	L/R90
Stitch Distance -	3stitches/cm

Cleaning: Clean all excess cement on leather with crape rubber.

Thread Burning: Burn the excess thread.

Packing: Pack with a poly bag.

Safety Precaution:

1. Switch off the machine when not required.
2. To be concentrated during cutting and stitching.
3. Hold cutting knife tightly during cutting.
4. Keep away your hands from moveable band and bell knife.

5. Thickness should be checked carefully.
6. Avoid long & loose sleeves.
7. Know the fire drill.
8. Keep the body away from moving parts of the machine.
9. Pay proper concentration to the work.
10. Check proper alignment between needle & needle plate hole.
11. Bring down top pressure wheel gently.
12. During changing any tools/ spares, switch off the machine.

Assessments Criteria:

1. Cutting regularity
2. Checking thickness of splitted leather
3. Skiving width & depth must be accurate as per instructions
4. Attaching must maintain the marking
5. Stitching must be 2mm far from the edge
6. Extra thread must be pulled down and attach or burn properly
7. Thread tension must be accurate
8. Slip stitch is not acceptable

Costing

Standard costing sheet for Dairy cover:-

Style No. - LP23

Customer – unisex

Types of sample: Dairy cover

Costing for: 2 piece

Price validity: 2 june-08 to 14 june-08

Material name	Quantity	Unit	Rate	Cost (Taka)
Leather	4.405	Sq. ft.	100	440.5
Needle	1	Piece	15	10
Thread	300	Meter	5tk/100m	25
Mill board	1	piece	15	15
Foam	1	piece	20	20
Pattern paper	1	Piece	16	16
Adhesive	1\4	Pot	40tk/pot	10
Packing box	2	Piece	15	30

Total of prime cost	=	456.5**tk**
15% production cost	=	68.475**tk**
15% profit	=	68.475**tk**
2% govt. tax	=	9.13**tk**
10% others	=	45.65**tk**
Standard selling price	=	648.22**tk**

So, the standard selling price of one piece dairy cover is 324.11Taka.

PHYSICAL TESTING RESULTS AND DISCUSSION FOR DIFFERENT TESTS:

The results obtained by different physical testing on the prepared leathers are tabulated in this chapter followed by short description of the results.

Table for the results of tensile strength and percentage elongation a break:

Sample	**Results for tensile strength and Elongation at break**			
	Perpendicular		**Parallel**	
	Tensile strength kg/sq cm	Elongation %	Tensile strength kg/sq cm	Elongation %
Standard for shoe upper: Tensile strength = Min. 200-300 kg/cm^2 % Elongation at break = Max.45-55 %				

Table for the results of stitch tearing strength:

Sample No	**Thickness (cm)**	**Tearing load (kg)**	**Stitch tearing strength (kg/cm)**
Sample No-1	0.08	14	175
Sample No-2	0.1	15	150

Table for the results of Lastometer test:

Sample No	**Lastometer test**	
	Grain Crack	Grain bursting strength (kg/cm)
Sample No-1	137.5	337.5
Sample No-2	340	480

REMARKS:

Fashionable diary cover has significant trend to the people. Bangladesh may be one of the important manufacturer countries and can earn a lot of foreign currency by exporting the leather goods because the raw materials are available here and very low cost.

Labor cost is also cheaper here comparing with other countries. If the government take proper step to improve the technology and Private Entrepreneur invest more capital in this sector, it will be very helpful to escalate the sector.

Conclusion

In the case of value addition in export the great prospect of leather product industry is well known to all today. The developing countries like Bangladesh have flourished. This value addition by transforming the finished leather into leather goods, like diary cover by utilizing cheap labor, we can improve our leather sector and can earn foreign currency.

The diary cover made out of leather lends themselves to an enormous variety of both useful and essential items, which are a need and asset in modern living. Leather goods are fashionable and highly expensive. So, we should illuminate on designing and manufacturing of leather goods.

Here, in this report I try my best to fulfill all the information about diary cover which I collected to mention in this report.

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