

Chapter 1

Introduction to Garment Leathers and Garments

Introduction to Garment Leathers:

Leather was the first clothing fabric over the past few decades. Leather has developed a racing reputation from bickers collars to lingerie. Leather is emerging as a hip look on the streets and in the office covering men or women, young or old from top to bottom. Thanks to a blend of nature and modern technology, the new look of leather is soft and supple. Leather has become a very specialized high fashion fabric that requires talented specialists to turn into a quality garment. Leather is tailored into hipster sheep skin pants, clinched waist jackets, goatskin shirts, double breasted suede shearling with shawl collar in a petite fit, pig suede soft silk nap sportswear, etc. Clothing leather is thin, versatile and almost silky and comes in a variety of eye catching colours viz. red, camel, gold-metallic, or olive. Even blue or green are no strangers in the rainbow shades. Animal prints, which are so popular in clothes, come to life as leather outfits. Relative to virtually all man made textiles, leather is very strong and has a high resistance to tears and punctures. The comfort provided by leather garments is due to leather's ability to combine breathing and insulating properties. Leather is hot in summers and cold in winters but in reality, it adjusts constantly to its environment. This is because, leather is a natural product and it breathes freely maintaining a comfort level in all seasons. Even in warm climates, leather is wearable and bearable. Leathers are constantly improved, as new finishes and colours are created. The richness and variety of leathers available to everyone at reasonable prices would be the envy of ancient potentates. Leathers and suedes can be dyed, glazed, buffed, polished, foiled, embossed, printed, patented, beaded, sparkled, perforated, stencilled silk screened, woven fringed or embroidered, to create a variety of looks. Leather is tanned and finished so that the grain side has a smooth rich surface. Most common types of leathers which are used for making leather garments is given below:

Cowhide:

Cowhide is the most common leather used in the making of garments. It covers a wide spectrum of textures and quality. It is quite durable, easy to care for and resistant to water and dirt. It takes the shape of the wearer making it more comfortable with every day use. This affordable functional leather offers fashion, value and endless colours and style. Cow napa leathers are suitable for making leather garments. Cow napa leathers are preferred in garments making because of its large area with increased cutting value and

smoothness of grain. It has good drape, fluffy feel, lightweight, cold-crack resistance and good stitch tear and tongue resistance (Fig.1-1).



Fig. 1-1: Cow napa leathers

Lambskin:

Lambskin is very soft, luxurious leather. Its natural lightweight layers give it distinctive velvet touch, which suits fitting jackets, pants, skirts as well as coats. With a little extra care, lambskin is very wearable and the ultimate luxury.

Sheepskin:

Sheepskin refers to the hide of a sheep used with the wool still attached. Usually, the wool side faces into the garment or accessory but it can also be reversible. The wool can be ironed which means straightened to yield a smooth fur like appearance or it can be left naturally curly. Whichever the way the wool is styled, this is the warmest leather available.

Pigskin:

Pigskin is the most popular and versatile, easily transformed into fashion's most current look. When tanned outside, it provides smooth napa finish, often used for jackets and accessories. Tanning on the inside results in a silky suede finish. The natural lightweight structure of the skin produces delicate patterns, textures and silky soft naps, perfect for sportswear, shirts and blazers.

Shearling:

Shearling refers to hides from lambs, which are much lighter in weight than sheepskin and much softer. Although they may be lighter, they are just as warm as the heavier sheepskins. They are elegant and attractive to a fur coat.

Sheep or lamb:

It is relatively unblemished skin. Its particular fibre structures and natural characteristics blend itself perfectly in today's fashion leather garments. Sheepskins are the unique material for making garments because of the real feather-touch feel, good softness and smooth grain when compared to the garments made from the goatskins and cowhides.

Sheep napa is the ideal raw material for making leather garments and it has the quality to drape well, fluffy feel, light weight, fashion feel, wear resistance, good strength, uniform shade, glossy appearance and thickness, wash resistance, fastness to wet and dry rubbing, fastness to perspiration, shower proof resistance, resistance to heat (ironing) cold and light.

Goatskin:

Goatskin has characteristic pattern and short and compact fibrous structure, with a unique look to the skin. It is used for a variety of products ranging from gloves to garments. Goatskins produce finer suede compared to cow hides. The suede has sheen nap which is uniform, tightly packed, and resilient (**Fig.1-2**).



Fig.1-2: suede leathers

Types of finishes in leather garments:

Aniline finish:

Aniline leathers, which are tumbled in vats, completely absorb the dye. There is no other colouring agents or process. Thus, the finished leather tends to look and feel more natural. The unique markings and characters of each skin are apparent. Usually, the best quality of sides are reserved for this process as aniline leathers are valued highest of consumers.

Semi-aniline finish:

Semi-aniline leathers are the combination of both pigment and aniline dyed. A very light pigment is added to even out the colour and increase the durability. Most garments are made with semi-aniline leathers.

Antique finish:

The light application of one colour over another colour (usually, a darker colour over the lighter colour) is to create highlights.

Nubuck finish:

The leather is finished with velvet like surface on the grain. Since the fibres in the grain layer are compact and short, the nap is fine and smooth. It is often mistaken for suede but

suede is the flesh side of the piece of leather while nubuck is an effect that is done to the grain side, making it considerably smooth and stronger.

Oil-pull up finish:

Oil pull up is done with the application of oils in full grain leathers. The oil can migrate when pressure is applied on the surface and come back when the pressure is released. Thus the surface will show two-tone effect when pressed or pulled.

Corrected grain finish:

The crust is buffed to remove the top grain pattern and treated with a filling type of resin binder, which makes the grain layer tight. Afterwards, several coating of finish mixes with high amount of covering material is applied. An artificial pattern similar to animal grain is applied using suitable pressure and heat in the hydraulic press. The finish can be modified to obtain glossy surface, waxy surface etc. and the surface is relatively uniform. Special effects such as brush off can be obtained by using suitable binders and colouring mixes.

Other special finishes:

Other special finishes like stone wash, sand wash, destroyer, marble, denim, distressed, metallic etc. are also done in garment leathers for making garments with high fashion and style.

Introduction to garment designing, colours, fashion and style:

Garment designing:

Garment designing is considered to be the most important one in the manufacturing of leather garments because they are largely exported to Western and European markets. Garments are designed according to the seasonal trends of fashion and style. Garments are designed in breathtaking beautiful collections which have a touch of class and finest textural techniques. Garment designing is not confined to aesthetic value and flamboyant style where artisans excel but other factors like comfort and function are equally important.

Colours:

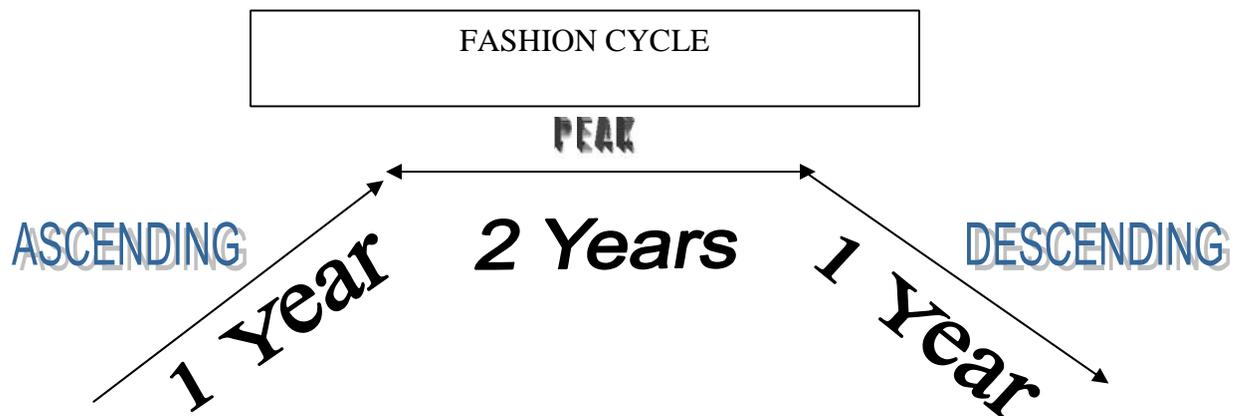
Good looking leathers in subtle pastel colours, moulded by meticulous sewing methods add up to the stuff of delicate dreams in garment designing. In garments designing, the sensuous silhouettes, fine detailing, unconventional style and invigorating colours add spark to the romantic feel. Flaunt apparels in a riot of colours are inspired by the exotica to create stunning looks. The right kind of colours enhances the beauty and lends dignity. Smart and sober, subdued and extravagant and shapes and styles with a play of colours have a bohemian touch. Colour match should hold well under different light sources viz. daylight, domestic light and even at the fluorescent light at point of sale. The Garment Industry must be able to provide consistently coloured garments, which will satisfy the end user and assess what is a “commercial “colour match given the differing production condition. Visual techniques of colour matching and colour assessment result in off-

shade garments being manufactured. So, colour assessment must be done with modern technology of using micro-processing system.

Fashion and style:

From the conservative-style garments of yore to present-day ones, fashion has undergone a sea change. So, it is fitting to have a bright and breezy feel of the season. Fashion knows no bounds. It rules the heart of youngsters, who give new dimension to style every day. It comes alive silently, but conquers the entire world unawares. Fashion is ephemeral, but comes back with new trends like a season. Its scopes are wide for it's both on industry and on art. Fashions and styles are the basis on which different designs are created. Fashions and styles are the marketing determinants. Particularly in the developed markets, fashions and styles could be designed in terms of demand. Fashions and styles are created by using different types of leathers, different types of finishes, new colours and colour schemes, impeccable tailoring, embellishments with intricate skills, prints, patches, frills, appliqués, exotic cuts, elasticized bands and computer aided designs. In today's swirling world, the fashion changes fast. So, it is necessary to create newer designs and introduce newer materials in designing garments to cater to the needs of the export markets. Exports could be a continuous and expanding affair if the designs are new, prices are competitive and quality unbeatable.

A major fashion cycle in garments occurs once in four years. A major new cycle ascends for about a year, remains in peak for 2 years and descends in a year. Though the fashion changes, the basic style remains the same for a longer period. New fashions or styles are not cycles but only ripples of changes.



Constructional styles and comforts:

Leather garments as warm-up outfits provide fit snugly and flex easily. The hardware, that provides closures and other fittings, is designed to stand up to the rigors of strenuous use. Zippers, snaps, shank buttons and hooks and eyes keep heavy garments closed. Buckles fit of various widths, Velcro tabs make hands are sheathed in mittens or gloves. The lightweight and slim linings keep the wearer comfortable. It effaces itself because its

purpose not to look dramatic but to provide modest cover beneath garment and to form smooth finishes for the inside seams and surfaces of garment. Strong seams and neat edgings relieve stress and strain of the garments. The buttoned plackets and separating zippers provide handsome, unencumbering closures for garments. For comforts as well as good looks, the waist on the jacket has to fit neatly all the time. The waist on the jacket not only needs to be snug enough to hug the waistline but also must be flexible enough to move easily with the wearer's body motion. With flattery but no fuss, collarless necklines underscore the obvious femininity of garment. Necklines such as cowl jewel and tie necklines eliminate facings that would be obtrusive. Stylishly sleeved or sleeveless make the garments more graceful to wear. Leather garments stitched in bright hues provide a dash of style and color for today's fast changing fashionable world.

Factors influencing designs:

Factors that influence designs are market strategies, economy, seasonal demands, newer colors, different types of leathers with newer finishes, range of models and styles, in-house production facility, local factors and novel fashion and style access to CAD through graphic terminals.



Fig.1-3: Leather garment designs

Styles:

Casual / informal/ formal/classical

Types of Garments:

Gents:

Jerkins, fly-Jackets, gent's coats, sports coats, trench coats, blazers, jeans, trousers, etc. (Fig. 1-4).



Fig. 1-4: Gents leather garments

Ladies:

Long coats, waistcoats, overcoats, pantaloons, blouses, skirts, etc.(Fig.1-5):



Fig.1-5: Ladies leather garments

Kids:

Midi and top, pine-a-fore, pedal pusher, frock, shorts, etc.(Fig.1-6):



Fig.1-6: Children leather garments

Other Types:

Fur and hooded garments, patchwork garments, combination garments with textile and wool, stencilled garments, printed garments, embroidered and zari garments. These garments are manufactured to embellish necklines and hems of dresses and both feminine and masculine tunics. Detailed with delicate embroidery and appliqué will have an aura of feminine elegance. (Fig.1-7):



Fig.1-7 Fur coats and other designed garments

Chapter 2

Sewing accessories

Sewing accessories are used for a variety of purposes such as closing, stiffening, joining, wadding, decorating, etc. in Leather Garments making. An extensive range of accessories are used to offer amazing possibilities of application and style to the garments. Sewing accessories are used not only to provide functionality and aesthetic value to the garments but also to make the garments cool, comfort and classy couture.

Linings:

Linings preserve the shape of the silhouette, allow slipping the garments on and off easily and hide the inner construction of the garments. A lining can match or contrast with the colour of the garment. It should add some degree of warmth to a garment and be strong enough to stand up to the kind of strain and abrasion it will be subject to. Natural and synthetic linings are used as linings in leather garments. Natural linings are cotton, silk and wool. Synthetic linings are nylon, polyester, rayon and combination of natural and synthetic fibres (**Fig.2-1**).



Fig. 2-1: Linings

Muslin cloth:

Muslin cloth is used to prepare sample garment developed from the final pattern. The sample garment is then put on the dummy for correct fitting. If any alteration is to be done, it is done in the sample garment so that the production pattern will be 100% accurate.

Shoulder Pads:

Flexible and rigid polyurethane foam pads are used in leather garments to achieve the desired shapes and styles. Polyurethane foam pads are lightweight and have insulation properties to resist heat or cold and so they are widely used in winter and high fashion garments (**Fig.2-2**).

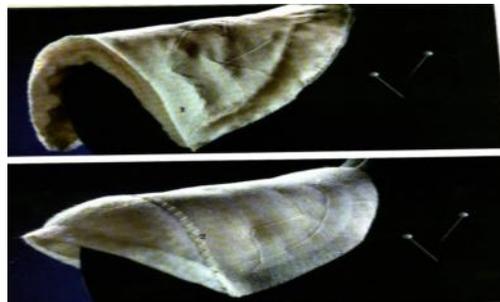


Fig.2-2: Shoulder pads

Buttons and closures:

A variety of buttons and closures are largely used in leather garments for decorative as well as utilitarian purposes. The right selection for the particular garment depends upon the design, texture, weight of the garment, colour and whether the garment will be dry-cleaned or laundered. Buttons and closures can be made of various materials such as wood, leather, bone, pearl, silver or gold colour metal and plastic. Most commonly used buttons and closures are:

- i) **Sew-through two-hole or four-hole buttons:** These are commonly used as all purpose buttons.
- ii) **Shank buttons:** They have a neck or shank underneath the button.
- iii) **Self-covered buttons:** They can be covered with the same leather or fabric as the garment for an exact colour match.
- iv) **Toggles:** These are loop-and-bar fasteners with leather or leather- like trim, used on lapped areas.
- v) **Frogs:** These are loop-and-ball fasteners that lend a dressy look to special outfits.
- vi) **Snap and Velcro tapes:** These are used as closures on lapped areas of jackets or casual dresses.
- vii) **Heavy-duty hooks and eyes:** These are used to close waistbands on skirts or pants.
- viii) **Hooks and eyes:** These are inside closures available in sizes appropriate to various fabric weights.
- ix) **Snaps:** Snaps are inside closures for areas that do not receive much stress.
- x) **Jumbo snaps:** These are fixed by appropriate snap fitting tool on the outside of a garment for a decorative effect (**Fig.2-3**).

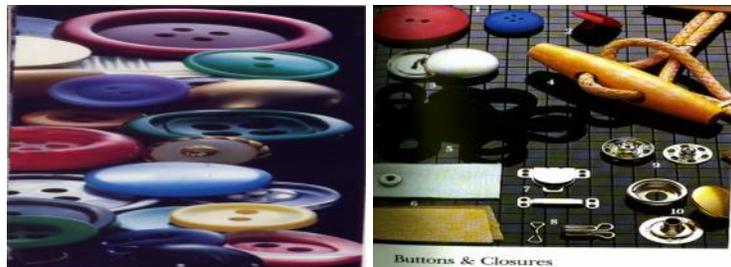


Fig.2-3: Buttons and closures

Zippers:

Zippers have metal or plastic teeth, or synthetic coil of polyester or nylon attached to woven tape. Both types come in all purpose weights. Coil zippers are lightweight, more flexible, heat resistant and rustproof. Metal zippers come in heavier weights for heavy garments and sportswear. Although the zippers are usually designed to blend into the garment, some are big, colourful and made to be shown off. Most commonly used zippers are: polyester all purpose zippers, metal all purpose zippers, brass jean zippers, plastic moulded separating zippers and parka plastic moulded separating zippers with two sliders. Zippers provide fashion appearance and satisfy multiple requirements of today's

fashion. Nylon and metal zippers are used in leather garments. Smaller zippers are used in pockets skirts, trousers, pants, blouses, etc as a closing device while bigger separating zippers are used in jerkins, fly jackets, sports-wear, etc.

Parts of the zipper:

- i) **Top stop:** It is small metal bracket at the top that prevents the slider from running off the tape.
- ii) **Slider and pull-tab:** It is the mechanism that operates the zipper. It locks the teeth together to close the zipper and unlocks the teeth to open the zipper.
- iii) **Teeth or coil:** It is the part of the zipper that locks together when the slider runs along it. It may be made of nylon, polyester or metal.
- iv) **Tape:** It is the fabric strip on which the teeth or coil are fastened. The tape is sewn to the garment.
- v) **Bottom stop:** It is the bracket at the bottom of the zip where the slider rests when the zipper is open. Separating zippers have a bottom stop which splits into two parts to allow the zipper to be completely opened (**Fig.2-4**).



Fig.2-4: Zippers

Wadding:

Wadding is used in quilted garments. It is made of smooth, soft high resilient polyester fibre. The advantages of wadding are: soft and light feel of silk cotton along with advantages of foam, breather, dip dry-washable, does not form lumps, moth proof, does not spread heat, non-allergic, odourless and long life The quilted garments make the wearer comfortable in subfreezing weather. (**Fig.2-5**).



Fig.2-5: Wadding

Interfacing:

Interfacing plays a supporting role in almost every garment. It is the inner layer of fabric used to shape and support details like collars, cuffs, waistbands, pockets, lapels and buttonholes. Interfacings come in many different woven and non-woven fibres and weights. Interfacings are chosen according to the weight of the fashion fabric, kind of shaping required and the way the garment will be cleaned. Interfacings are available in woven or nonwoven fabrics. Woven interfacing has a lengthwise and crosswise grain. It must be cut with the same grain as the part of the garment to be interfaced. Bonding fibres together makes nonwoven interfacing. It has no grain. Stable nonwovens can be cut in any direction and will not ravel. Both woven and nonwoven interfacings are available in sew-in and fusible versions. Sew-in interfacing must be pinned or basted and is ultimately held in place by sewing machine stitching. Fusible has a coating on one side which when steam pressed, melts and fuses the interfacing to the wrong side of the garment. When applying fusible, a press cloth is used to protect the iron and provide extra steam (**Fig.2-6**).

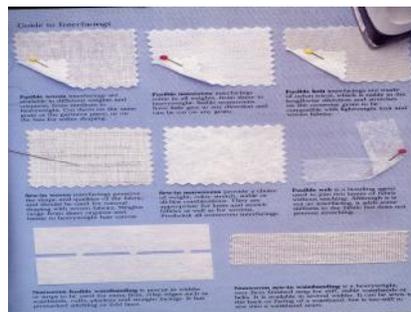


Fig.2-6: Interfacings

Elastics:

Most elastic are made from a rubber core yarn covered with cotton, synthetic or a blend of fibers. They may occur as single yarn or several yarns braided or woven together. Woven elastic tapes are made out of 100% polyester textured yarns in different sizes and colours and are used in garments making. Elastic is inserted in casings to shape

waistbands, wrists and neck lines. Knitted and woven elastics are softer than braided elastics, curl less and can be stitched directly onto the garment. Non-roll waistband elastic has lateral ribs to keep it from twisting or rolling (**Fig.2-7**).

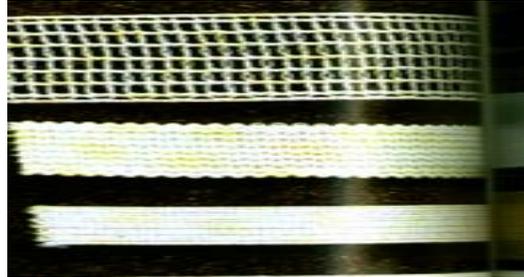


Fig.2-7: Knitted, woven and braided elastics

Woven Labels:

100% polyester woven labels in different colour combinations are stitched to leather garments, which provide information about brand, manufacturing country, size, garment care, etc.

Threads:

Thread for machine sewing comes in three weights – extra fine for lightweight fabrics and machine embroidery, all purpose for general purpose sewing and topstitching and buttonhole twist for decorative and accent stitching. As a general guideline, natural fiber threads must be used for natural fibre fabrics and synthetic fibre threads for synthetic fabrics. Thread should match the weight of the fabric and the size of the needle. For perfect tension, the thread must be of the same size and type in the bobbin and in the needle. Threads must be compatible with the fibre content, construction, weight and care requirements of the garment. Polyester cotton threads are widely used for stitching garments. Thread numbers 50 and 75 are used for light and medium weight garments and for linings and thread number 90 is used for stitching garment leathers (**Fig.2-8**).



Fig.2-8: Threads

Eyelets:

Eyelets are round metal reinforcements for holes that are made in belts and laced closures. Depending on the style and design of the garments, varieties of eyelets made of brass, antique, synthetic etc in different sizes and shapes are used (**Fig.2-9**).



Fig.2-9: Eyelets

Ribbons:

Colour ribbons are used to tie the dummy and take measurements for the development of basic pattern blocks (**Fig.2-10**).



Fig.2-10: Ribbons

Buckles:

Fancy belt buckles in different sizes and shapes are used in garments with high fashion and style. Belt buckles made of brass; antique, anodized and plastic with attractive colours to match the garments are used (**Fig.2-11**).

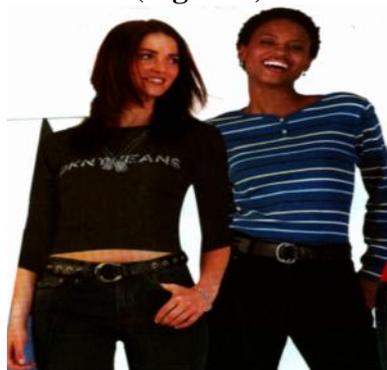


Fig.2-11: Buckles

Velcro:

Velcro is a nylon tape closure with the nap sides laid face to face. The nap is different on each tape, one is rather flat and the other is fuzzy with little burrs on it. Their threads interlock when they are pressed together, to form a fastening. It opens by pulling the two tapes apart. It comes in different widths and colours. These are designed as a substitute for snaps or buttons. It has a useful place on sports jackets, belt lines of wrap-round skirts and on children's garments. Velcro is available in a variety of shades and sizes to match the garments (**Fig.2-12**).

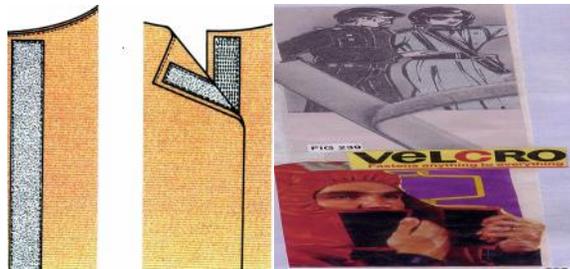


Fig.2-12: Velcro

Needles:

Machine needles are selected according to the weight and other garment characteristics, as well as the thread type being used. In general, needle should be fine enough to penetrate the fabric or the leather without marring it and it should have a large enough eye that the thread does not fray or break. Machine needles are made in different sizes and types to suit the varying needs of sewing. A sharp pointed needle is used for most sewing. A ball-point is used for knits because its rounded point tends to slide down between the yarns rather than pierce them. A wedge point or leather point needle is especially designed to penetrate leathers and vinyl. Sewing needle numbers 80, 90, 100, 110 are used for stitching leather and lining components (**Fig.2-13**).

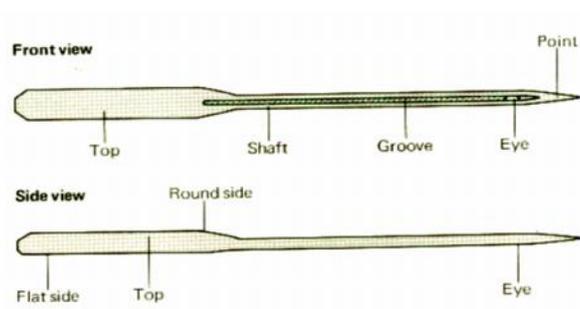


Fig.2-13: Sewing needles

Pins:

Pins are used for every sewing need. Very fine pins for delicate fabrics and thicker pins for heavy fabrics. They come in several lengths with colour heads. Some may have ballpoints to prevent fibre damage when they are inserted into the fabric. Silk pins are used for light to medium weight fabrics, straight pins are used for general sewing, pleating pins are used for pinning delicate fabrics in the seam allowance, quilting pins are used for heavy materials and ball point pins are used for knits **Fig.2-14**).



Fig.2-14: Pins

Dummy/Mannequins:

Dummies and adjustable dummies are used for development of basic blocks and for the construction of patterns. They are also used to check correct fitting and shape after stitching garment. Mannequins are used for display **(Fig.2-15)**.



Fig.2-15: Dummies/Mannequins

Hangers:

Plastic aluminium and plastic coated hangers are used to hang leather garments **(Fig.2-16)**.

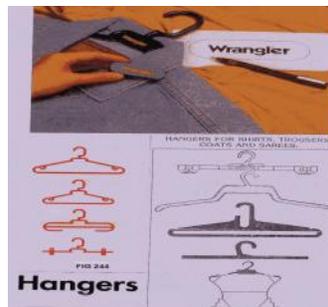


Fig.2-16: Hangers

Double-faced tape:

Double-faced tape has adhesive on both sides and will hold zipper in position or fabric layers together for stitching. Sewing over tape must be avoided and tape should be removed after completing seam (**Fig.2-17**).



Fig.2-17: Double-faced adhesive tape

Adhesive:

Natural rubber adhesive is used for assembling garments before stitching (**Fig.2-18**).



Fig.2-18: Adhesive

Brushes:

Brushes of different types are used according to the requirements for applying adhesive on the components. Glue dispenser is more convenient to use as the handle controls the flow of adhesive. This can prevent excess application of adhesive and stains to the components (**Fig.2-19**).



Fig.2-19: Brushes

Teflon pieces:

Teflon pieces of size 12 cm x 8.0 cm. are used for punching works.

Mill Boards / White Boards:

Thick mill grey boards or white boards are used for making patterns in the manufacture of garments.

Tissue sheets:

Tissue sheets are used to draw the parts of the garments with accurate measurements and subsequent use for constructing patterns to make garments (**Fig.2-20**).



Fig.2-20: Tissue sheets

Chapter 3

Tools and equipments

Good tools and equipments help to give more professional finish to sewing. Basic sewing is divided into: marking, measuring and drafting, cutting, stitching and pressing. For each of these processes, there are essential tools and equipments to make the steps easier and the results superior.

TOOLS:

1. Marking tools:

The symbols on pattern piece are the guides for the accurate construction of the garment. Transferring these symbols from pattern to leather or lining is essential to fitting and sewing. Therefore, it is necessary to have a variety of marking tools (**Fig.3-1**).

i. Tracing wheels:

Tracing wheels are used to transfer pattern markings to garment leathers. Tracing wheels come in two types. They are serrated and smooth edge. The serrated edge-tracing wheel makes a dotted line marking but may pierce delicate ones. The smooth-edge tracing wheel protects delicate, smooth linings. It makes a solid line marking.

ii. Tailor's chalk/Silver marking pencil:

Silver-marking pencil is used to mark on leathers and linings with patterns for cutting components. It marks quickly and easily, directly on leathers and linings.

iii. Awl:

An awl or stiletto is a small sharp instrument, used to make marks in the patterns for fixing fittings.



Fig.3-1: Marking tools

2. Measuring and drafting tools:

Body and pattern measurements both require measuring and drafting tools. To ensure a good fit, accurate measurements with the best tools are essential (**Fig.3-2**).

i. See-through ruler:

See-through ruler lets to see the measure or mark. It is flexible plastic of size 12” or 18” long. It is useful to check grain line, mark buttonholes, tucks and pleats and as a guide for tracing wheel.

ii. Tape measure:

Tape measure is essential for taking body measurements. It is a flexible synthetic or fibreglass, which will not tear or stretch. A 60” (150 cm) long tape with metal tips and measurements on both sides is used to take body measurements for correct fitting.

iii. Stainless-steel rulers:

Stainless-steel scale of sizes 12”, 24” and 1 meter are used for taking measurements. Stainless steel meter scale is used to measure longer lengths such as pants and coats. They are also used as cutting aids for cutting patterns and components.

iv. Seam gauge:

Seam gauge helps to make quick and accurate measurements for hems, buttonholes, scallops and pleats. It is a small 6” (15 cm) metal or plastic ruler with a sliding marker.

v. T-Square:

T-square is used to locate cross grain, alter patterns and square off straight edges.

vi. L-Square ruler:

L-square ruler is used for drawing straight lines and obtaining other desired angles.

vii. Set squares: A setsquares is used to draw straight lines while drafting patterns on the paper.

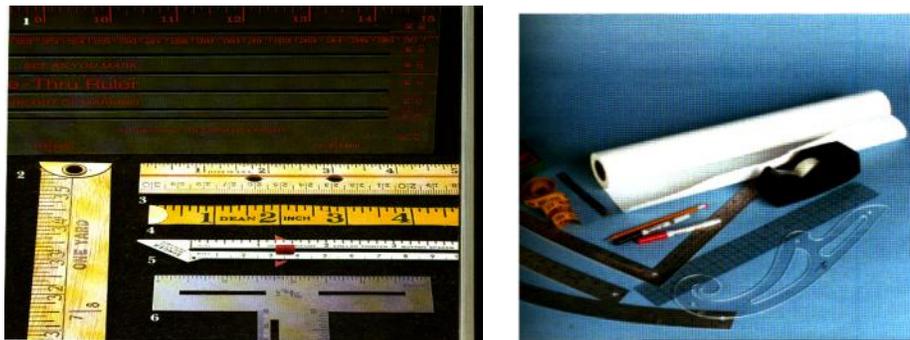


Fig.3-2: Measuring and drafting tools

viii. French and sleigh curves:

French curve is useful when re-drawing construction lines on patterns, especially in curved areas such as armholes, necklines and other design problems.

Shallower curve is used for drawing necklines, armholes and other details such as front hems and pockets (**Fig.3-3**).

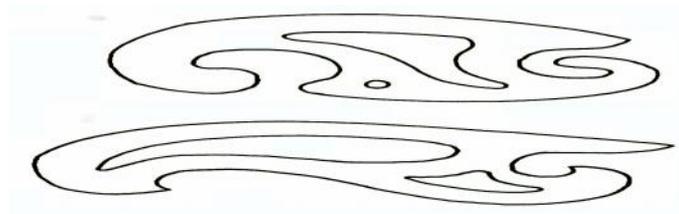


Fig.3-3: French and sleigh curves

ix. Hem gauge:

Hem gauge is used for marking straight or curved hems. It is useful for adjusting pattern lengths.

x. Skirt marker:

Skirt marker is an accurate tool for marking hems. It can be adjustable for all fashion lengths.

xi. Notch marker:

Notch marker is used in pattern making to mark various points such as necklines, waistlines side seams, etc.

xii. Drafting paper:

Drafting paper is crisp, translucent and comes 36” in wide on a tube. It is good for drafting, copying and adjusting patterns.

3. Cutting tools:

i. Clicking knife:

Clicking knife is made of high-speed steel hacksaw blade and is used to cut paper and board patterns. It is also used to cut leather and lining components (**Fig.3-4**).



Fig.3-4: Clicking and utility knives

ii. Scissors and shears (Fig.3-5):

Scissors have both handles the same size but shears have one handle larger than the other. Scissors and shears are hot-forged, high-grade steel, honed to a fine cutting edge. The blades are joined with an adjustable screw to ensure even pressure along the length of the blade. Sharp shears make clean cuts and well-defined notches.

iii. Bent-handled shears:

Bent-handled shears are best for pattern cutting because the angle of the lower blade lets leather/lining lie flat on the cutting surface. 7” or 8” (18 or 20.5 cm) are most popular but 12”(30 cm) shears are also used. Chrome-plated shears are used for heavy-duty cutting. The lighter models with stainless steel blades and plastic handles are used for lightweight linings while a serrated-edge shears are used for synthetic linings.

iv. Pinking shears or scalloping shears:

Pinking scissor or scalloping shear is used for zigzag or scalloped cutting at the edges of the components. Zigzag fold edges give more elegance than plain fold edges. It cuts a ravel-resistant edge.

v. Lingerie shears:

It cuts sheerest fabric and trims close to stitching line. Serrated blades prevent slipping or stretching.

vi. Tailoring scissors:

It has sturdy blades for cutting heavy fabrics or leathers.

vii. Sewing scissors:

Sewing scissors have one pointed and one rounded tip for trimming and clipping seams and facings. 6" (15 cm) sewing scissor is most practical.

viii. Electric scissors:

It cuts quickly through light or heavy fabric or leather to make job easier and less tiring.

ix. Seam ripper:

Seam ripper has sharp curved edge for cutting seams open and a point for picking out threads. It can also be used for slashing machine-worked buttonholes. It must be used carefully to avoid accidental cutting of fabric.

x. Rotary cutter:

Rotary cutter works like a pizza cutter. The sharp wheel cuts easily through multiple layers of fabric. It must always be used with a protective cutting mat under the fabric. This is very useful for slippery fabrics, fine sheers and suedes.

xi. Thread trimmer:

Thread trimmer is used to trim excess thread after stitching. The trimmer with spring action blade is more convenient than shears and is safer than a seam ripper

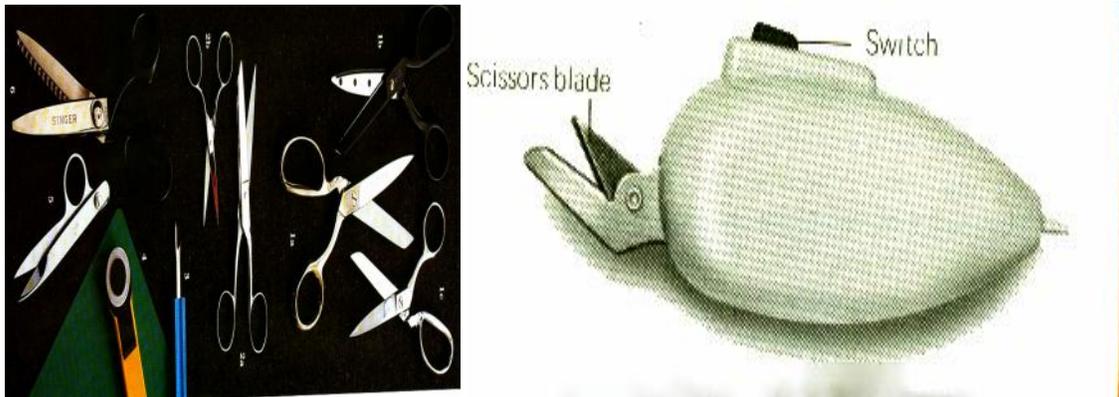


Fig.3-5: Scissors and shears

4. Punching tools (Fig.3-6):

i. Lightweight Plastic Hammer/Hand stamper:

Lightweight plastic hammer/hand stamper is used for light works during assembling process. It is used mainly for folding glued edges of the components.

ii. Button fitting tools:

It is a set of tool and used for fixing various sizes of buttons in the garments.

iii. Notch punching tool:

Notch punching tool is used to make centre marks ('v') for assembling components accurately without any deformity in the shape.

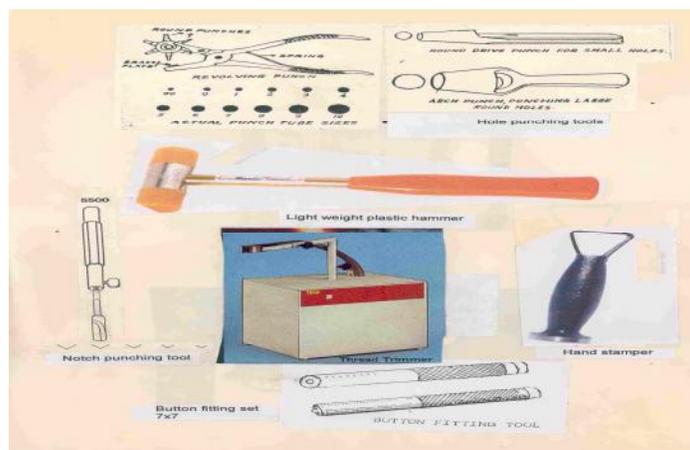


Fig.3-6: Punching tools

5. Other tools (Fig.3-7):

i. Loop turner:

Loop turner is specially designed with a hatch hook device at one end to grasp bias tubing or cording and turn it to the right side. It is quickest and easier than attaching a safety pin to one end and working the pin through. Since loop turner's wire is so fine, it can be used for very narrow tubing and button loops.

ii. Bodkin:

Bodkin threads ribbon, elastic or cord through a casing without twisting. Some bodkins have an eye through which ribbon or elastic is threaded. Other tweezers grab the elastic. The bodkin has a ring, which slides to tighten the prongs of the pincer.

iii. Point turner:

Point turner is a flat wooden or plastic tool with a pointed end for pushing out tailored points in collars, lapels and pockets without risking a tear.

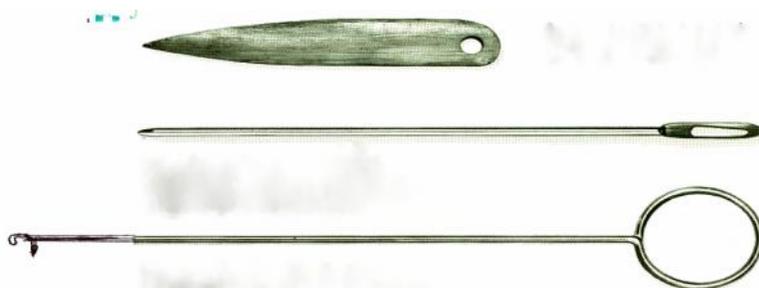


Fig.3-7: Point turner, bodkin and loop turner

iv. Thread burning tool:

Different types of thread burning tool/equipment are used in garment industries. Soldering tool is used in small industries while electronic thread burning tool is used in medium and big industries, Thread burning tool is used to fuse excess thread after stitching. It is very useful in finishing area to fuse excess thread (**Fig.3-8**).

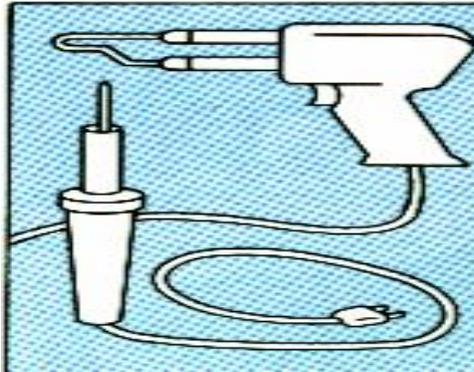


Fig.3-8: Soldering tool for fusing synthetic threads

EQUIPMENTS:

1. Pressing equipments:

Pressing is important at all stages of sewing to shape and set stitched lines. Using the right pressing equipment with correct pressing techniques is essential to shaping the stitched garment to fit body contours smoothly (**Fig.3-9**).

i. Steam/spray iron:

Steam/spray iron should have a wide temperature range to accommodate all fabrics. An iron that steams and sprays at any setting is helpful for synthetic fabrics. A large heavy sole plate is necessary for fusing interfacings. An iron with surge of steam button provides optimum steaming and eliminates the need for a dampened press cloth with a dry iron.

ii. Hand steamer: It is lightweight steam iron, providing a concentrated area of steam at a low temperature setting. No press cloth is needed, even when pressing on the right side of the fabric. It heats to a steam temperature in less than two minutes and is useful for darts, seams, pleats and hems.

iii. Tailor's ham:

Tailor's ham is used to press shaped areas such as curved seams, darts, and collars or sleeve caps. The ham is a firmly packed cushion with rounded curves. One side is cotton and the other side is covered with wool. Wool covering on one side holds steam and the cotton covering side enables for pressing at high temperatures.

iv. Pressing mitt:

The mitt is similar to the ham but is especially handy for small, hard-to-reach areas especially shoulders and set-in sleeves. It fits over the hand or sleeve board.

v. Press cloth:

Press cloth helps to prevent iron shine and is used when applying fusing interfacing. The transparent variety allows seeing if the fabric is smooth and the interfacing properly aligned. Cheesecloth is used for pressing lightweight garments and cotton or linen cloth for pressing heavyweight garments.

vi. Sleeve board:

Sleeve board is two small ironing boards attached one on top of the other. It is used to press seams and details of small or narrow areas such as sleeves, pant legs or necklines.

vii. Seam roll:

Seam roll is firmly packed cylindrical cushion for pressing seams. The bulk of the fabric falls to the sides and never touches the iron, preventing the seam from making imprint on the right side of the fabric.

viii. Point presser/clapper:

Point presser/clapper is made of hard wood and used for pressing seams open in corners and points. The clapper flattens seams by holding seam and heat in the fabric. It is used to achieve a flat finish and sharp edges on hard surfaces.

ix. Iron sole plate cover:

It attaches to the bottom of any iron to prevent scorching and shine on fabrics. It may be used in place of a press cloth for safe pressing on delicate and napped fabrics.

x. Needle board:

It has a flexible bed of steel needles, which are angled so the pile of a fabric falls between needles for pressing. Use a needle board to prevent crushing or matting velvets and plush fabric textures.



Fig.3-9: Pressing equipments

xi. Tabletop Ironing board:

Tabletop ironing board is portable and saves space. It is used for pressing detail. A soft cotton cover absorbs excess moisture and helps prevent iron shine on garment fabrics. (Fig.3-10).



Fig.3-10: Tabletop ironing board

xii. Fusible ironing press:

It is used to fuse several small garment sections such as collar, cuff, etc. quickly because pressing surface is considerably large than sole plate of an iron (**Fig.3-11**).

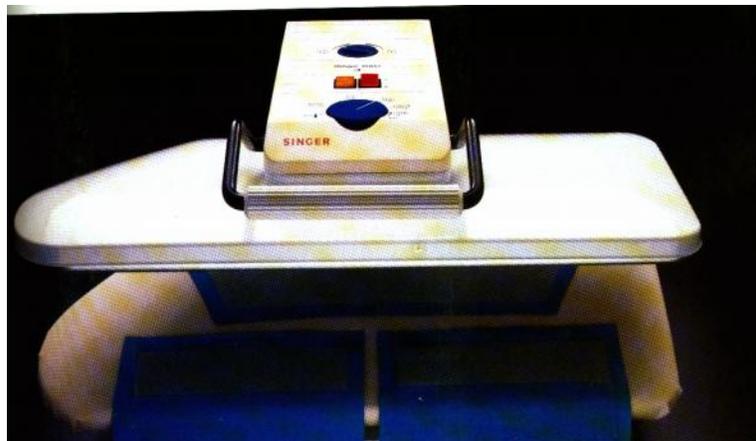


Fig.3-11: Fusible ironing press

2. Dirt, spot and thread trimming equipments:

i. Dirt and spot Eliminating and Cleaning vacuum Unit:

This equipment is used to remove dirt and spots in the garments. These defects occur due to frequent handling of the components during assembling process. It is fitted with cleaning spray gun and vacuum unit.

ii. Brush:

Brush is used for brushing garments and for pounding delicate areas.

iii. Thread Trimming System:

Thread trimming equipment is used to clean threads from the finished garments either on hangers or on finishing table. It is fitted with two trimming heads that are connected to a

vacuum system by long hoses. When head is pressed over the garments, loose threads are drawn into the trimming mouth by suction and then neatly cut, leaving a clean and presentable garment (Fig.3-12).



Fig.3-12: Dirt cleaning and thread trimming

3. Tagging and labelling equipments (Fig.3-13).

i. Tagging Gun:

Tagging gun is used to attach tag in the garment, which indicates the name of the garment, design code and price.

ii. Labelling Gun:

Labelling gun is used to print labels for garments. It can be able to hand print up to 100 labels per minute boldly and legibly.

iii. Labelling Press:

It is used to press up to three labels in the garment in a single operation. It can fuse bold intricate designed labels in many coloured and colour combinations, which will be crisp and clear to the smallest print. It can also fuse labels, motifs, fibre contents, size codes, badges, brands etc in the garments (Fig.3-13).



Fig.3-13: Tagging gun, labelling gun and labelling press

Chapter 4

Leather garments machinery

A variety of machines such as industrial flat-bed single needle lock stitch sewing machine, industrial flat-bed twin needle lock stitch sewing machine, zigzag sewing machine, automatic buttonholing machine, automatic button sewing machine, automatic pocket welting sewing machine, automatic over-lock sewing machine, lining cutting machine, fusing machine, etc. are used for various functions in leather garments manufacturing industry. These machines are imported ones because garments are manufactured for export markets. Small scale leather garment industries mostly do job works of stitching garments for large scale leather garments manufacturers and also do limited volume of production in their spare time. So, they use indigenous and imported flatbed sewing machines with limited attachments. Since medium and large scale leather garment industries mostly export leather garments to Western markets, they use a variety of sophisticated imported machines to ensure quality speed and volume of production. Important machines, which are generally used by leather garments industries, are detailed below:

Industrial flatbed single needle lockstitch sewing machine:

It is an important sewing machine used by all levels of leather garments manufacturing industries. It is used to stitch from light to heavy leather garments. The principal parts of the sewing machine are given below (**Fig.4-1**):



Fig.4-1: Industrial flatbed sewing machine

Parts of the sewing machine:

Hand wheel:

The machine is worked by turning the hand wheel, which is driven by an electrical clutch motor. The hand wheel can be turned by hand to make a single stitch or to raise or lower the needle.

Treadle:

Treadle, which is connected to the motor, controls the speed of the machine.

Needle bar:

Needle bar moves the needle up and down.

Presser bar:

Presser bar holds the presser foot and often incorporates a thread cutter at the back of the bar. The pressure can be adjusted to suit different thickness.

Presser foot:

Alternating presser foot presses against the material from upper side and helps to guide material in a straight line during stitching. A variety of presser foot can be attached to perform different functions.

Needle:

Needle carries upper thread down through the material so that the shuttle can pick it up and complete the stitch.

Presser bar lifter:

Presser bar lifter is used for raising or lowering the presser bar.

Bobbin winder:

Bobbin winder winds thread through a tension control to ensure even winding.

Bobbins and bobbin case:

Bobbins are circular and vary in size according to the machine. The bobbin thread feeds through an adjustable tension spring on the bobbin case. The bobbin fits into the bobbin case which either slots in under the needle plate or is inserted from the front or side. In some machines, there is no separate case. The bobbin is dropped into a fixed case.

Stitch selector:

Stitch selector controls are incorporated into the stitch width dial, which will be marked with appropriate symbols. Automatic machines have a pattern panel with a lever or moveable pointer that selects the stitches.

Thread take-up lever and thread guides:

The thread feeds through the eye in the take-up lever and down to the needle. Thread guides are small loops of wire that guide the thread from the spool to the needle.

Stitch length regulator:

The length of the stitch is determined by the rate at which the material is fed under the foot by the feed dog, which is regulated by the stitch length control. The control can be a graduated lever or a numbered dial.

Feed dog:

Feed dog moves the material for stitching.

Stitch width control:

This control is found in all machines except straight stitching type. It controls the width of the zigzag and decorative stitches and may be a graduated lever or a numbered dial.

Tension control:

Tension controls located on the front of the machine or partially concealed on the top. It contains disks, which act like brakes and control the rate at which the thread feeds to the needle. The tension is altered by a numbered dial or by a plus and minus indicator.

Needle plate:

The needle plate surrounds the feed dog and has a small hole for straight stitch and a slot for a zigzag stitch.

Shuttle:

Shuttle holds bobbin and lower threads and cycles with needle to sew.

An introduction to sewing:

A basic requirement of all machines is a precisely timed movement of needle and shuttle hook to manipulate a top and bottom thread into a stitch. Tension discs and thread guides, which are basic in any machine, help to control the flow of threads. Another important function of a sewing machine is stitch formation, which is the interaction between the presser foot needle and feed. While the presser foot holding the material in place, and the needle is going through the material into the bobbin area to form stitches, the feed is moving the material into position for each stitch. The functions described above are for plain straight stitch. For zigzag stitches, the needle moves from side to side. These provisions are built into the machine, which can be used by adjusting stitch length and width regulator or insertion of special cams.

Timed sequence in stitch formation (Fig.4-2):

- i. The needle penetrates the fabric to bring top thread into bobbin area.
- ii. As needle rises, top thread forms a loop for shuttle hook to catch.
- iii. Shuttle hook carries thread loop around and under the bobbin case.
- iv. Loop slides off hook and bobbin case, goes around bobbin thread.
- v. Threads are pulled up and are set into the fabric as a lock stitch.

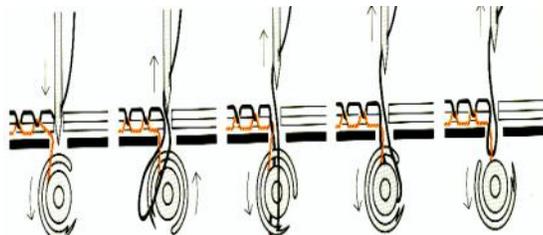


Fig.4-2: Stitch formation

Upper threading:

The thread is fed from the spool through the tension discs, then to the take-up lever and finally down to the needle. The number of thread guides between the points will vary with the machine. Before threading, two things have to be remembered – i) the presser foot must be raised. This will allow the thread to pass between the tension discs and ii) the take-up lever is brought to the highest point so that the needle will not come unthreaded when first stitch is started.

Bobbin threading:

The lower thread supply for a sewing machine is stored in the bobbin area, situated under the needle and throat plate and the bobbin and a case into which it fits. The thread should be wound evenly on to the bobbin. If it is not, there may be trouble in stitching or unevenness in stitch tension.

Bobbin removal:

Before removing bobbin, the needle and take-up lever is brought to their highest positions. The presser foot is lifted and opens the side plate to gain access to the bobbin area. Before removing bobbin, it is best to cut thread short extending from the bobbin.

Lower threading (Fig.4-3):

Lower threading involves threading the bobbin into its case. To thread a removable bobbin case:

- i) Bobbin and the case are held as shown in the figure. The thread feeds off bobbin in the same direction as slot.
- ii) The bobbin case is put by bracing with finger. The thread is grasped and brought to slot opening.
- iii) The thread is brought down under tension spring.
- iv) The thread is pulled over around end of bobbin tension spring and the case is now threaded.
- v) The bobbin case latch is grasped and pulled out from the back of the bobbin case.
- vi) The case is inserted into the machine and the bobbin case latch is released.

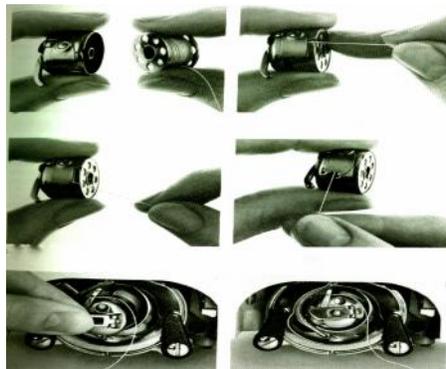


Fig.4-3: Threading a removable bobbin case

Needle insertion and needle faults:

The needle clamp is first loosened to insert the needle. Then, with the flat side of the shank facing away from and the groove of the needle facing towards the last thread guide, the needle is pushed up into the clamp as far as possible. Then, the needle clamp screw is tightened.

Needle faults:

- i. If needle is not fully inserted into the needle clamp or the groove is not positioned to the correct side, the result is skipped stitches. So, needle must be inserted carefully.
- ii. If needle is wrong size for machine or fabric, the stitch formation is affected. So, needle with proper conformation and size must be inserted.
- iii. If needle has a burr on the point, eye or groove, the thread might fray or break or fabric might be damaged. A blunt needle can cause noise as it penetrates the fabric. It might also result in pulling on the fabric yarns or in skipped stitches. If the needle is bent, there might be skipped stitches, the fabric could be pulled to one side or the needle might hit the throat plate and break. So, a perfect needle must be replaced.

Needle/ thread/stitch length:

Name of the materials	Threads	Needles	Stitch length
Lightweight leathers and vinyl	polyester/ polyester cotton	wedge pointed needle 80-90	8-12
Medium weight leathers and vinyl	-do-	wedge pointed needle 90-100	8-12
Heavy weight leathers and vinyl	-do-	Wedge pointed needle 100-110	6-10

Table 4-1: Needle, thread and stitch length

Pressure and feed:

Pressure and feed interact to produce an evenly stitched seam. Pressure is the downward force exerted on the fabric by the pressure foot to hold the fabric layers so that they move evenly together during stitching. Feed is an upward force that moves the fabrics under the pressure foot. The pressure on the presser foot is supplied by a spring on the presser foot bar. The spring is controlled by a pressure regulator. The feed is controlled by the stitch length regulator. The smaller the stitch length setting, the shorter the distance the feed moves the fabrics for each successive stitch. Correct pressure ensures that the fabric layers feed evenly with each other. The stitches look even in length and tension and the fabric is not dragged by either feed or presser foot. Too much pressure can cause the top layer slips while the bottom layer gathers up. Stitches could be uneven in length and tension. The feed could damage the bottom fabric layer. Too little pressure can cause poor control over guidance of fabric layers even though they may be feeding evenly. The stitches can be uneven in length and tension, skipped stitches and pulling of the fabric into the bobbin area.

Stitch tension:

Every machine has a tension control for top and bobbin thread. These controls increase or decrease the pressure on the threads as they are fed through the machine. Too much pressure results in too much tension and too little thread for the stitch. Too little pressure produces too little tension and too much thread. In general, too little thread causes fabric puckering, strained easily broken stitches and weak seam. When the pressure is correct on both threads, a balanced amount of each thread is used. To get correct pressure, both the tensions must be adjusted. The top thread tension can be adjusted by the top thread tension control. The bottom thread tension can be controlled by bobbin tension screw. It is turned clockwise to increase and counter-clockwise to decrease the tension.

Sewing machine accessories:

Sewing machine accessories perform a variety of special tasks. There are universal accessories that fit any sewing machine, such as zipper foot, buttonhole attachments, seam guide and various hemming feet. The zigzag plate and the general-purpose foot usually come with the machine. Other accessories included are the straight stitch plate and foot, buttonhole foot, zipper foot, seam guide, various hemming feet and roller foot.

Buttonhole attachments:

Buttonhole attachments allow stitching complete buttonholes in a single step. One type stitches and adjusts the buttonhole length to fit the button placed in a carrier behind the foot. When the button is larger or of unusual shape or thickness, the gauge lines can be used instead of carrier. Another type of buttonholer makes buttonholes automatically using templates of various sizes (Fig.4-4).



Fig.4-4: Buttonhole attachments

Straight-stitch and zigzag plates and feet:

Straight-stitch plate and foot are used for straight stitching only. The needle hole in the plate is small and round. They do not allow for any sideways movement. These features are used for edge stitching or collar points. Zigzag plate and foot are used for zigzag stitching. The needle hole in the plate is wider and the foot has a wider area for the needle to pass through allowing for side-to-side needle motion (Fig.4-5).

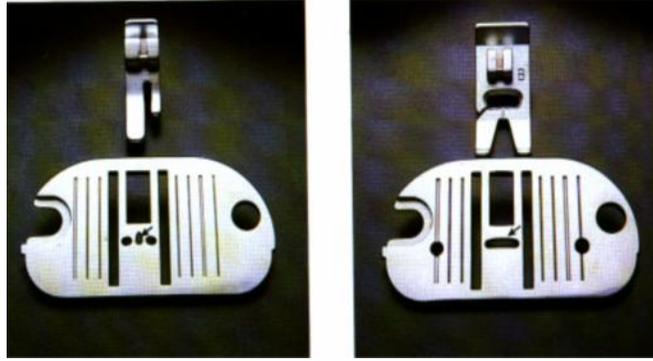


Fig.4-5: Straight-stitch and zigzag plates and feet

Zipper foot, seam guide and blind stitch hem foot:

Zipper foot is used to stitch cording, insert zippers, sew bound buttonholes and stitch any seam that has more bulk on one side than the other. It adjusts to either side of the needle. Invisible zipper foot is used only for insertion of invisible zippers. Seam guide attaches to the machine bed and helps keep seam allowances even. It adjusts to any seam width and swivels for sewing curved seams. The bottom of foot has two channels through which zipper coils pass while zipper is being stitched. Blind stitch hem foot positions the hem for blind stitch hemming (**Fig.4-6**).

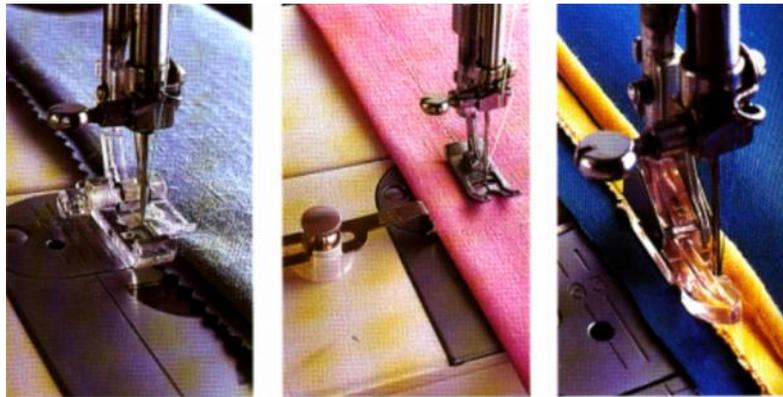


Fig.4-6 Zipper foot, seam guide and blind stitch hem foot

Even feed foot, button foot and over edge foot:

Even feed foot feeds top and bottom layers together so seams start and end evenly. It is used for vinyl, pile fabrics and other fabrics that tend to stick, slip or stretch. It is also used for topstitching. Button foot holds flat buttons in position for attaching with machine zigzag stitch. It saves time when sewing several buttons on a garment. Over edge foot helps keep stitches at full width and prevents curling of flat edges when sewing over edge stitches. Stitches are formed over a hook on the inside edge of the foot (**Fig.4-7**).



Fig.4-7: Even feed, button and over edge feet

Sewing machine needles:

Sewing machine needles are made of different sizes and types to suit the varying needs of sewing. Sharp point needles are used for most general-purpose sewing. It commonly ranges from 65 to 110. Ballpoint needles are specially designed for sewing synthetic knitted fabrics. Its rounded point tends to slide between the yarns rather than pierce them. The size ranges from 65 to 100. Wedge point needles are specially designed to penetrate leathers and vinyl. The size of the wedge point needles range from 80 to 110 (Fig.4-8).

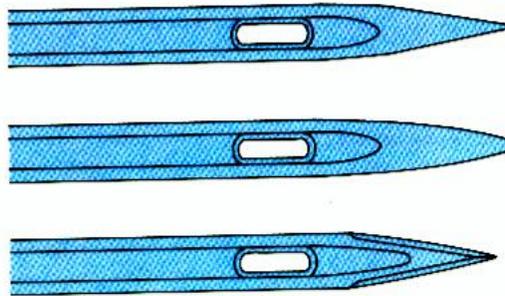


Fig.4-8: Sharp-point, ball-point and wedge-point needles

Bobbins:

Bobbins may be built-in or removable for winding. Bobbins may be made of plastic or metal. Their sides may be smooth-surfaced but some of the metal ones have several holes in each of the sides. Bobbins with a built-in case are wound in the case. Removable bobbins have a removable bobbin case with a tension adjustment screw. They may be wound on the top or side of the machine (Fig.4-9).



Fig.4-9: Bobbins

Machine breaks lower thread: Possible cause Bobbin improperly wound Bobbin bent Dirt or lint in bobbin case Bobbin case bent	Action Rewind bobbin. Replace with a new one. Clean the bobbin case. Replace with a new one.
---	---

Table 4-5: Sewing machine problems – Lower thread breaking

Machine breaks needle: Possible cause Improper needle Presser foot out of line Material is pulled during stitching Needle bar bent Wrong size of needle for materials Needle bar out of time Needle improperly set up	Action Fix the correct size of needle. Adjust to proper position. Allow the machine to feed itself. Replace with a new one. Use appropriate size needle depending upon thickness of the materials. Check for the timing. Check the needle for proper set up.
---	--

Table 4-6: Sewing machine problems – Needle breaking

Machine does not feed: Possible cause Feed dog clogged by lint or thread Feed dog teeth worn out Presser bar incorrectly adjusted Presser foot loose	Action Clean the feed dog with a brush. Replace the feed dog with a new one. Adjust the presser bar. Tighten the presser foot.
---	---

Table 4-7: Sewing machine problems – Feeding problems

Industrial flatbed twin needle lock stitch sewing machine:

It is used for sewing belts, pockets, lap seaming, hemming and binding in the garments. It is also used for topstitching on front, collar, pocket, pocket flap, cuff, etc. in trench coats, safari coats, jenkins, jeans, etc.(Fig. 4-10).

Automatic pocket welt sewing machine:

This machine has microcomputer system, which can memorize up to 9 different lengths of pocket welts. Pocket welts from 25 to 195 mm. can be easily made and sewn (Fig. 4-10).

2-Needle, Needle Feed, Lockstitcher with Organized sp
Needle Bar, Large Hook, Reverse Feed and Autom
Corner Stitch Counting Device

APPLICATIONS

Top stitches on front, collar, pocket, pocket flap, cuff etc.
of trench coat, working wear, one piece dress, safari jacket,
denim jacket and men's shirt.

SPECIFICATIONS

Sewing speed : Max. 2,000 s.p.m. (Max.
1,500 s.p.m. when using
embroidery thread #5)
Stitch length : Max. 7 mm (9/32")
Reverse feed : 8 mm
(115/64")



Automatic Pocket Welt Sewing Machine

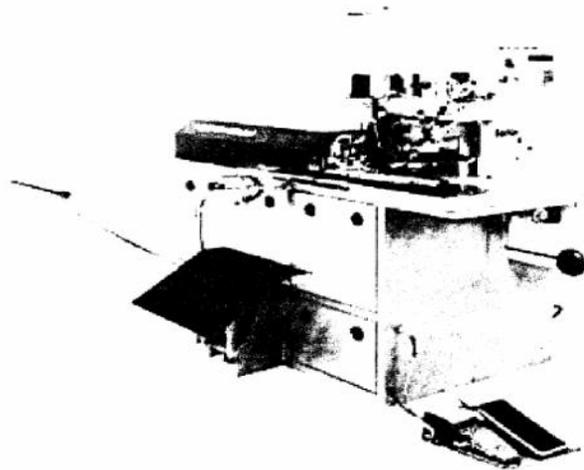


Fig.4-10: Automatic pocket welting and 2-Needle stitching sewing machine

Buttonholing machine:

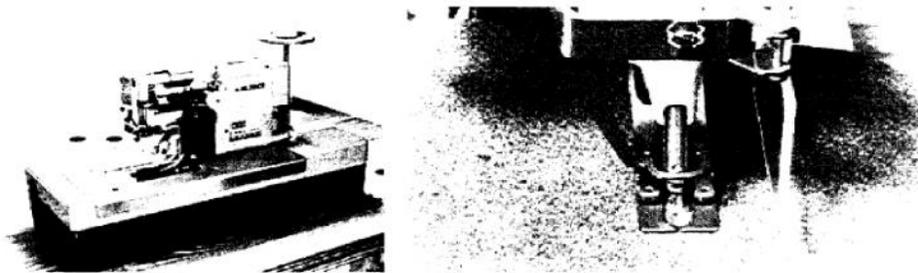
One thread chain stitch buttonholing machine is used to make buttonholes in front and cuffs of the garments (**Fig.4-11**).

Button sewing machine with automatic thread trimmer:

It is used to chain stitch a variety of buttons viz. flat, wrapped, shank, etc. in garments. (**Fig.4-11**).

High Speed 1-Thread Chainstitch Buttonholing Machine

USAGE: Buttonhole front and cuffs of sports shirts, men's shirts, blouse, pajamas, babies' wear and the like made of light, medium heavy weight materials or knit fabrics.



1-Thread Chainstitch Button Sewing Machine with Automatic Thread Trimmer & Automatic Button Feeder

USAGE: Sew automatically fed buttons on light weight materials like dress shirts, blouses, work shirts.

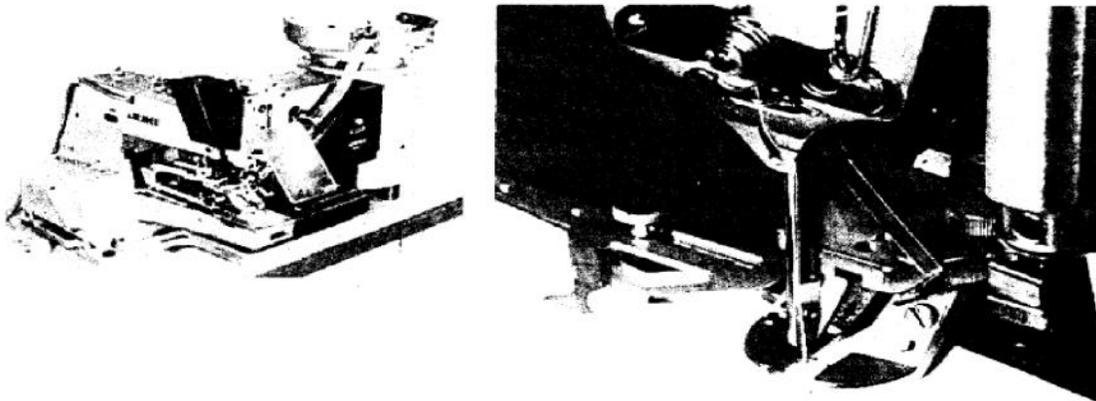


Fig.4-11: Button holing and Button sewing machine

Chain stitch label attaching sewing machine:

It is used to attach labels in garments.

Over lock machine:

An over lock machine, also called a serger, is used to make self-finished narrow seams, rolled hems, blind stitched hems and overcast edge finishes. It is also used to apply elastic, ribbing, ribbons and lace. Commonly used models are 4 thread, 3 thread and 4/2 thread. It is fitted with an industrial sewing needle. There are two knives. One knife is made of high carbon steel and the other knife is less durable and may require replacement. Knives work like blades of scissors to trim the fabric for the stitch width selected (Fig.4-12).

Continuous Top Fusing Machine:

It is used to fuse waistbands, collars, cuffs, etc. It covers sizes of 60 cm. – 360 cm. to accommodate normal fusing requirements. It has good production speed with low temperature for bonding. It is fitted with visual display to read out fusing. Quick and easy change of fusing conditions helps to fuse all types of garments (**Fig.4-14**).

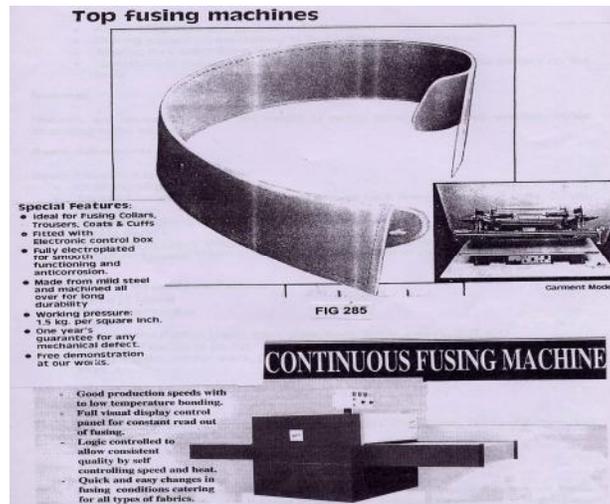


Fig.4-14: Top fusing machine

Chapter 5

Introduction to pattern making

Introduction to pattern making:

Garments are manufactured mostly on buyers' orders. Garments are also made for customers and for display purposes. In the first case, the buyers' send sample garments with details regarding styles, types of leathers, fittings, etc. for manufacturing garments. So, measurements can be taken from the sample garments and patterns can be cut accordingly for manufacturing garments. In the second case, measurements of the customers are taken with a tape measure and correct patterns are cut accordingly for making garments. In the third case, garments are made by cutting patterns according to standard body measurements and introducing new designs, styles, colours, embellishments, etc. for display purposes. In all above cases, basic patterns are necessary for making garments. Let us study in detail – what are patterns and how they are cut for making garments.

Pattern designing:

The success of any sewing venture depends upon choosing the right patterns for making garments according to the frequent changing of designs, styles and fashion trends. When manufacturers show their seasonal lines to store buyers, buyers won't order if they don't think the garment is right for the style. Every season, many samples never go into production or stores because buyers don't like them. The beginning for the sewing process starts with choosing a pattern for a garment. Patterns are classified according to figure type as well as styles and size ranges, for example men, women, misses, girls, boys, etc. Size and figure are not the same.

The beginning of pattern designing starts from sample making unit. In the sample-making unit, the preliminary processes of taking measurements, drawing patterns, pattern adjustments, making test garments for perfect fitting, pattern cuttings, introducing newer designs, styles and colours, selection of raw materials, etc. are done by a designer and a pattern maker.

Role of Pattern Designer:

- Liaison with buyers
- Foreseeing the fashion trend and planning
- Creating newer design and blending with fashion and style by CAD/CAM System.
- Techniques of pattern grading system by CAD/CAM (**Fig.5-1**).
- Resource collections – samples, linings, buttons, fittings, etc
- Sample making
- Liaison with production control, cost factors, competition and marketing.



Fig. 5-1: Pattern grading by Cad/Cam system

Role of Pattern maker:

- Pattern adjustments
- Techniques of pattern cutting
- Instructions to be followed while cutting patterns
- Name of the style
- Pattern size
- Name of each piece
- Centre back/centre front
- Fold Lines
- Balancing Marks (matching points marked by a notch)
- Grain Lines
- Construction marks (darts, button holes, pockets, pleats, punch holes etc)
- Seam allowances
- Number of pieces to be cut

Objective of Grading:

- To obtain different sizes from a basic pattern
- To obtain structure - big, small and obese
- To make garments according to specification
- To follow the techniques of garment making
- To keep all sizes adjusted and pay special attention to the attractiveness, style, and unction aspects of the garments.

Working Sketch:

- Type of skin
- Front and back views
- Specific details – style, pocket details
- Assembly details
- Seam allowances
- Types of Accessories
- Decorative details
- Linings
- Any other special instructions.

Measurements:

To select the correct size of the pattern for the garment to be made, it is important to have body measurements, which ensure the correct fitting. Body measurements can be taken over the usual undergarments by using a non-stretch, plastic coated tape measure (Fig.-1).



Fig.5-2: Body measurements

1. Height: Measure without shoes.

- A.** High bust: Measure around the chest, under arms and above full bust line.
- B.** Full bust: Measure around the fullest part of the bust around the back.
- C.** Waist: Measure around the waist over the string.
- D.** Hips: Measure at the fullest part of the hips.
- E.** Hip drop: Measure the distance from the waist to the fullest part of the hips.
- F.** Back waist length: Measure from the middle of the most prominent bone at the base of the neck to waistline string.
- G.** Bust level: Measure from the centre of the shoulder to the centre of the bust

- H. Front waist length: Measure from the centre of the shoulder, down over the bust, to the waist string.
- I. Shoulder width: Measure from the base of the neck to the tip of the shoulder bone.
- J. Back width: Measure across the back 12.5 cm. below the neck bone.
- K. Sleeve length: Measure from the point of the shoulder to the wrist bone with a slightly bent elbow.
- L. Shoulder to elbow: Measure from the point of the shoulder to the point of the bent elbow.
- M. Upper arm: Measure around the fullest part of the upper arm.
- N. Skirt length: Measure from the centre back at the waist to the desired length of the skirt.

Pant measurements:

- A. Waist: Measure around waist over the string.
- B. Hips: Measure at the fullest part of the hips.
- C. Hip drop: Measure the distance from waist to the fullest part of the hips.
- D. Finished length: Measure over hip to desired finished length.
- E. Thigh: Measure the thigh at the fullest part while seated and add 5 cm. for basic ease.
- F. Crotch depth: While sitting on a flat chair, measure from the waist string to the chair surface with a ruler and add 1.2 cm. for sitting ease.=

Guidelines for pattern size:

Dress, coat or jacket size is selected according to full bust measurement. Size for skirt and pants is determined by hip measurement, even if the hips are larger, proportionately, than the waist.

Personal measurement chart:

After the measurements are taken and decided on a pattern size, a personal measurement chart is made to make necessary adjustments in the pattern.

Particulars of measure	Personal measurements	Standard body measurements	Amount of adjustment
------------------------	-----------------------	----------------------------	----------------------

Table 5-1: Personal measurement chart

After taking personal measurements, the first two columns are filled in the chart. The third column is filled with standard body measurements given in the pattern envelope (figure for women’s standard body measurements are given as an example above). Circumference of the upper arm, bust position, shoulder and back width can be measured from actual pattern pieces. High bust, full bust, waist, hips and back waist length will determine the right pattern size. Coat and jacket patterns must be selected using the same measurements. Sufficient ease has been allowed and so they will fit comfortably over other garments. Pants and skirts are bought by hip measurement. To determine the correct size of the pattern, the size of the pattern is selected which is closest to the body measure. The fourth column of the personal measurement chart is ready to be filled with the measurements given in the pattern selected. The measurements in the first two columns

are compared. The differences, if any, are written down in the fourth column, which will help to make pattern alterations. Once the pattern is chosen with the right number and size, the same can be bought with a pattern envelope containing all useful information from reputed pattern making companies.

The pattern envelope:

The pattern envelope contains valuable information from a description of the garment to the amount of fabric needed. It gives ideas for choosing fabric and colour.

The envelope front:

The front envelope gives the following information: i) Pattern brand, number and size, ii) different views or ways of making the patterns, iii) labels to identify construction methods, degree of sewing, special fittings, size related information, special fabrics, etc. and iv) fashion illustration suggesting suitable fabrics and fittings.

The envelope back:

The back envelope gives the following information: i) the details and style of back view of the garment, ii) number of pattern pieces, iii) finished garment measurements indicating finished length and width, iv) notions such as thread, zipper, buttons and seam binding for the garment construction, v) garment descriptions indicating style, fit and construction information, vi) suitable fabrics for the garment selected, vii) body measurement and size chart to make alterations if needed and vi) yardage chart tells the quantity of fabric to buy for the size and garment view selected.

Standard body measurements (inches/centimetres) and size chart for altering

pattern:

Figure: (women's) Size:	38	40	42	44	46	48	50	52
Bust	107	112	117	122	127	132	137	142
Waist	89	94	99	105	112	118	124	131
Hip	112	117	122	127	132	137	142	147
Back waist length	44	44	44.5	45	45	45.5	46	46

Table 5-2: Standard body measurements and size chart

Inside the pattern:

In the inside of the pattern envelope, printed tissue pattern pieces, direction guide which guides step-by-step construction of the garment, sewing directions and cutting layouts are found. All pattern pieces are identified with a number and name.

Fashion drawings and views:

They are featured prominently on the direction sheet sketched or as detailed line drawings. Some patterns illustrate each garment separately with the pattern pieces used in its construction. Most patterns illustrate all the pattern pieces together with a key to identify the pieces used for each garment or view.

(Fig.5-2).

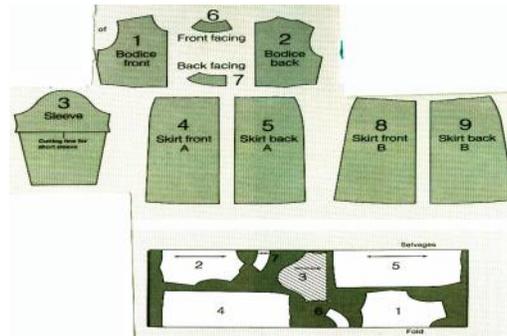


Fig.5-2: Illustration of patterns

General instructions:

Instructions are given which contain tips on how to use the pattern, pattern and fabric preparation, pattern markings, cutting, layout and marking tips, etc.

Cutting layouts:

Cutting layouts are shown for each garment view, which may differ according to the width of the fabric, pattern size and whether the fabric is with or without nap. The tissue pattern pieces are printed with universal symbols. Each pattern piece has instructions and a variety of symbols printed on it. Lay out and cutting symbols need not be transferred but construction symbols must be transferred for accurate garment construction. Since garments are identical on right and left sides, most pattern pieces represent half a garment section. The direction sheet is a guide to pattern pieces needed for each view and to cutting and sewing. Layouts for interfacing and lining are also given. When the fabric piece is to be cut in a single thickness or on the crosswise grain, the pattern layout indicates it with a symbol. A pattern piece, right side up is illustrated without shading and wrong side up is shaded. The layout for the correct pattern size, fabric width and view is circled.

Sewing directions:

It is given as a step-by-step guide for constructing the garment. Beside each instruction, there is a sketch illustrating the sewing technique. The right side of the fabric is shaded and the wrong side is plain. Interfacing is indicated with dots.

Pattern pieces:

The pattern envelope contains tissue patterns with instructions and symbols printed on them. Layout and cutting symbols such as grain lines need not be transferred to the fabric. Construction symbols must be transferred to the fabric for accurate garment construction. Construction symbols and their uses are given below (Fig.5-3):

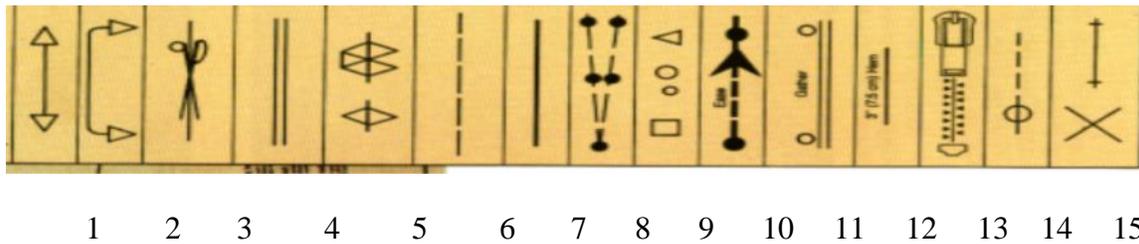


Fig.5-3: Construction symbols

- 1. Grain line:** Heavy and solid line with arrows-to place pattern piece on fabric with arrow parallel to selvage.
- 2. Fold bracket:** Long bracket with arrows at each end-to place pattern piece with arrows exactly on fold of fabric.
- 3. Cutting line:** Heavy solid line along outer edge of pattern-to cut on this line.
- 4. Adjustment line:** Double line indicating where patten, can be lengthened or shortened before cutting-to shorten by making a tuck in between lines and to lengthen by cutting pattern between lines and spread apart.
- 5. Notches:** Diamond shapes along cutting line-to make short snips into seam allowance and to match like-numbered notches accurately.
- 6. Seam line:** Long broken line of 1.5 cm. inside the cutting line-to stitch 1.5 cm..
from cut edge
- 7. Fold line:** Solid line marking -to fold along this line when sewing facings, hems, tucks or pleats during construction.
- 8. Dart:** Broken line and dots forming a “V” shape, usually at hipline, buntline or elbow-to fold along center line, to match carefully lines and dots and to stitch to a point.
- 9. Dots, squares or triangles:** Dots, squares or triangles, usually found along seam lines or darts to make precise matching, clipping or stitching.
- 10. Easing line:** Short, broken line with small dot at each end-to makes ease stitch.
larger piece and pull up stitching to match smaller piece
- 11. Gathering lines:** Two solid or broken lines or small dots at each end, marking an area to be gathered-to make two rows of ease stitching between dots of larger piece and to pull up stitching so that dots match with those on smaller piece.
- 12. Hemline:** Hem allowance of 7.5 cm. printed on the cutting line-to turn hem up the specified allowance (7.5 cm.) for adjusting.
- 13. Zipper placement:** Parallel rows of triangles along seam line where zipper is to be inserted-to insert zipper, pull-tab and stop at the indicated position.
- 14. Detail positions:** Broken lines indicating placement of pockets, tucks or other details-to mark and position detail where indicated,
- 15. Button and buttonhole placements:** Solid lines indicate length of buttonhole, X or illustration shows button size or placement-to mark and position where indicated

Good fitting:

Good fit begins with the right figure and right size pattern selection. It helps to make a minimum of adjustments. A garment that fits well is comfortable to wear. It is comfortable not only when you stand in front of a mirror but when you walk, move and

fit. It does not need constant adjusting because it follows body contours. Fit is most critical through the shoulders and neckline. A good fit depends upon appearance, comfort, design and fabric. For a good appearance, all darts and seams must fall in proper places and the garment should have a smooth look without pulls, or wrinkles or sagging and baggy areas. For comfort, wearing ease is the main criteria. For a good design, good fitting is the most important factor. For fabric, it is crucial to use the right type of fabric to suit to the styles of the garment. Selecting the correct pattern size is important in garment making. To prevent extensive pattern changes in these areas, the pattern size according to the bust or high bust measurement is chosen. Making a test garment is necessary for accurate fit and design corrections. Major adjustments to accommodate a full bust, sway back and full upper arms should be made on the test garment. They cannot be made after the garment is cut. Jackets and coats requiring wearing ease to fit comfortably over other garments. The standard measurements given in the pattern are compared with body measurements. Necessary adjustments are made for the right length and the correct size to fit around bust line, waistline, hipline and upper arm. Enough wearing ease and design ease are included to achieve the desired fit and fashion look. Basic pattern can also be altered by using a fitting shell, which is closely fitted sheath. It may be a dress, pants or just a bodice sewed in inexpensive fabric and used exclusively for solving fitting problems. It is used to fit body as closely as possible. The master pattern, which is developed from it, can be used to alter virtually every pattern to be sewn. The sewed shell is put over the dummy or mannequin and adjusted to solve all fitting problems. These alterations are transferred to the pattern pieces from which the shell was made. The adjusted pieces are the master pattern (Fig.5-4).



Fig.5-4: Adjustments for making master pattern

Guidelines for jacket and coat wearing ease:

Fitting area	Amount of ease
• Bust line	9 – 15 cm.
• Hipline	9 – 15 cm.
• Upper arm	7.5 - 14 cm.
• Upper back	3.8 –7.5 cm

Table 4-3: Jacket and coat wearing ease

Basic pattern alterations:

Most of the alterations needed to bring patterns closer to personal measurements can be done right on the pattern. For basic pattern alterations, the first step is taking individual measurements. The second step is comparing individual measurements with the pattern's standard body measurements to find the places that need alteration. The final step is making the alterations. When several alterations will have to be made, the length alterations should always come first. Length alterations should be attended in the following order – above the waist, below the waist or overall length and then the sleeve. The next area of attention should be dart placement (darts pointing in the proper direction and are correct length). After darts are properly placed, the next alterations should be width adjustments. Width adjustments should be made first at the bust, then at the waist and then at the hip. Other specialized alterations take place after all basic length and width changes have been made. The pattern pieces that might need to be lengthened or shortened are the bodice, sleeve and hip line of a skirt or pant. Other adjustments that a basic pattern might need are: bodice-bust, shoulder, front and back yokes, neckline and armholes; skirt – waistline and hip line; sleeve-circumference and pant-length, crotch depth and waist, hip and thigh. Make these alterations in the basic pattern before cutting, using the adjustment lines marked on the pattern pieces. The pattern is lengthened by cutting along the pattern alteration line. The edge of the pattern piece is taped to a wide piece of paper and ascertained whether the grain line matches exactly across the gap. The excess paper is trimmed at the pattern edges blending the cutting lines where necessary. To shorten, a line is drawn on the pattern piece parallel to the alteration line with the distance between the two lines the amount of adjustment. The bottom line is folded up to meet the top line and the fold is taped in place. The cutting line is corrected and blended where necessary (Fig.5-5).

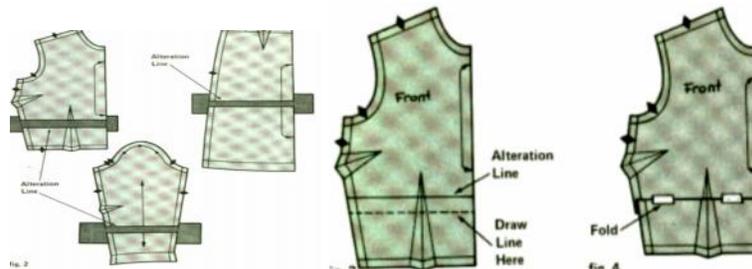


Fig.5-5: Basic pattern alterations

Making alterations (Fig.5-6):

1) Slide the entire pattern to add needed extra fabric.

- Lay and pin pattern piece in place.
- Cut the area of the piece (A to B) that does not need alteration.
- Measure and mark additional width needed.
- Slide the entire pattern to give the desired change.
- Pin pattern to fabric and complete cutting from B to A.
- Transfer the construction markings.

2) Pivot one corner of pattern piece to add to one end only.

- Lay and pin pattern piece in place.
- Cut the area of the piece (C to D) that does not need alteration.
- Measure and mark additional width needed at one end only.
- Pivot one corner of pattern piece to give desired change ©, but do not move the end of the pattern (D) where alteration is not needed.
- Pin pattern to fabric and complete cutting from D to C.
- Slide pattern to original position to transfer the construction markings.

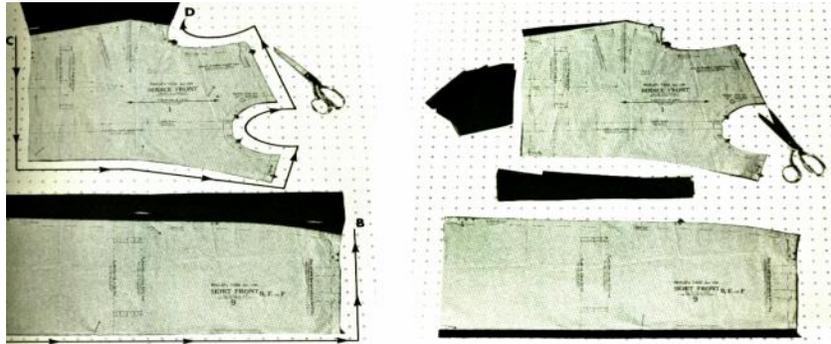


Fig.5-6: Pattern alterations

Points to determine the basic pattern fit:

- Grain lines at chest, bust, waist, hip and upper arm are straight and parallel to the floor.
- Grain lines at center front and back are perpendicular to the floor.
- Garment hangs gracefully and smoothly when standing straight.
- Garment has sufficient fullness throughout for movement in sitting, bending and walking.
- Bodice length is correct both above and below the grain line at front and back bust line.
- Skirt is correct length.
- Sleeves are correct length above and below the elbow.
- Neckline fits smoothly, without gaping or pulling.
- Center front and back seams are in the center of the figure.
- Side seams lie halfway between front and back, perpendicular to the floor.
- Shoulder seams lie straight across the shoulder.
- Sleeve seams lie across the tip of the shoulder for normal unpadded shoulder. As amount of padding increases, the sleeve seam moves out on the shoulder.
- Bodice darts point directly to the fullest part of the bust.
- Hip darts end just above fullest part of the hip.
- Elbow darts are even, with center dart pointing directly to point of elbow when arm is bent.

Pattern layout and marking:

Every pattern piece is identified by name, number and view. The alteration line shows where to shorten or lengthen the pattern. It is located in the least disruption of garment lines. The grain line is shown as a heavy black line with arrows on each end. It is essential when laying out the pattern. It must always be parallel to lengthwise or crosswise threads of the fabric (**Fig.5-7**).

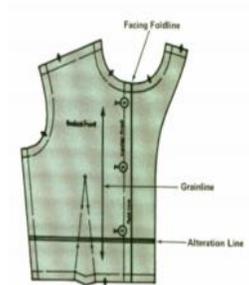


Fig.5-7: Pattern layout and marking

“The place on fold” means that the black line must be perfectly placed on the fold of the fabric. The cutting line is usually a heavy black line around the outside edge of the pattern piece (**Fig.5-8**).

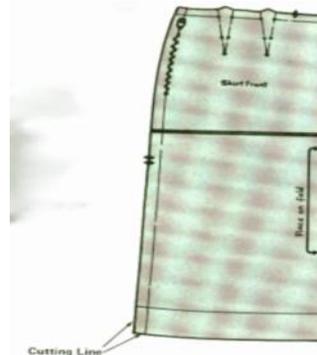


Fig.5-8: Cutting line mark

Construction symbols, shown in column 9 of pattern symbols-dots, squares or triangles, are important matching points on the pattern or they mark the beginning and end of a seam. The seam line is indicated by a long broken line, which is usually parallels the cutting line. The space between the cutting line and seam line is the seam allowance, usually 1.5 cm.

Darts are used to shape two-dimensional fabric to a three-dimensional figure and also come to a point at both ends. Notches show correct edges to join for a seam. Notches are numbered in the order they will be used in construction. Buttons and buttonholes have distinct, clear markings. It must be adjusted if the pattern is lengthened. Center front and center back shoulder never be changed except for length. Collars, buttons and buttonholes are closely related to the center front or center back and so they must be marked carefully and accurately (**Fig.5-9**).

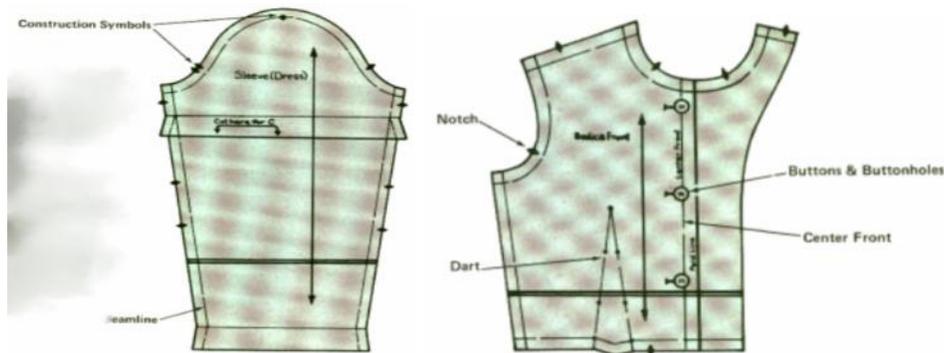


Fig.5-9: Pattern markings

Several pattern pieces are printed on one big sheet of tissue pattern. After making necessary adjustments for constructing the garment in the tissue pattern, all the details such as figure, size, raw materials (leathers and linings), notions, darts, construction symbols, placement lines, notches and other details are transferred from the tissue pattern to drafting sheets or drawing sheets or cartridge drawing sheets, using pattern making instruments such as rulers, geometrical instruments, hip curves, French curves, seam gauge, see through T-square etc. and cut as separate pattern pieces.

Test Garment:

Making a test garment, often called muslin, is highly recommended. The more fitted the style, the more important it is to test the fit first. A test garment enables to check pattern adjustments perfect before cutting the components for garments making and desired style changes. It can be made from an inexpensive firmly woven fabric, which will give an accurate reading of how the garment will fit and hang. It is worth the effort even though the test garment will not be worn. The muslin fabric is spread on the cutting table and the direction of the fabric is chosen. The paper pattern pieces are laid out on the fabric. To ensure proper placement of the patterns, each pattern is marked with an arrow pointing to the top of the piece. The weights are laid to hold the pattern pieces to hold the fabric and the fabric is cut with a sharp knife on the dark cutting line. Notches can be cut outward from the notch markings or with short snips into the seam allowance. The pattern pieces are removed and the cut fabric pieces are machine basted as per the instructions given in the sewing guide for step-by-step construction (Fig.5-10).



Fig.5-10: Laying out patterns

The machine- basted test garment is worn over the dummy. If any changes are needed for perfect fitting, it is done before cutting the components for garments making. When fitting the test garment, it is made slightly larger than the fit of the final garment. This allows for the thickness of the garment leather and extra room taken up by the lining and interfacing layers. Corresponding changes on facing, interfacing and lining pieces are also carried out. After making all changes in the patterns, they are stuck with glue over thick white paper boards or millboards and cut as separate pattern pieces. Patterns can also be cut in the pattern-cutting machine by programming all the details of pattern with adjustments in the computer. These patterns can be used for several times for making garments, if the patterns are handled carefully. Once the patterns and type of leather for making garment are chosen, they are sent to sample making unit for stitching garments for buyers, customers and display purposes. The sample-making unit is looked after by a designer and a pattern maker. They are well conversant with the designs and styles of the garments and also techniques of fabricating a wide variety of leather garments.

Guidelines for fitting jackets and coats (Fig.5-11):

- Vertical seams hang straight and perpendicular to the floor.
- Fronts hang straight at the hemline without spreading open’
- Bust line darts point to, and stop short of, fullest part of bust.
- Shoulder seams lie on top of shoulders and appear straight, without pulling towards the front or back.
- Set-in sleeves are smooth and pucker-free with softly rounded caps. There are no diagonal wrinkles in sleeve cap and sleeve does not pull across upper arm.
- Sleeves cover wrist bone by 1.2 to 2.5 cm.
- Collar hugs back neckline without gaping or wrinkling across the back.
- Lapels hug the bust line without gaping when garment is buttoned.
- Back vent hangs straight and perpendicular to floor without spreading open across seat.
- Hem is straight parallel to floor at a fashionable and flattering length. Hemline does not hike up in front or back.
- Garment fits around body smoothly without pulls or wrinkles. Reaching does not cause strain across upper back.
- Garment is comfortable over clothing to be worn with it.



Fig.5-11: Jacket fitting

Selection of leathers:

The selection of leathers is done according to buyers or customers' choice. Selection of leathers, for display purposes is done according to the design, style, color and fashion trend.

Selection of linings:

Selecting lining fabric for leather garment is very important. The lining is the finishing touch, covering the inner construction and protecting the garments from unnecessary wear. It also absorbs the most of the wearing strain and prevents the garment from stretching out of shape, particularly, where closely fitted. Linings should be as durable as the garment leather. Lining should be of high quality that will withstand repeated wearing and dry cleaning. Rayon, rayon/acetate, polyester are excellent choice for linings. The linings should be lighter in weight and softer than the garment leather, with a smooth surface that slides over the garment without rustling. Lining should be chosen that falls into soft folds when draped over the hand. The textured linings must be avoided that cling to other garments. Although a jacket or coat lining is on the inside of the finished garment, the edges of the sleeve lining often show or the lining often visible on moving. So, color is an important consideration. The lining color must be dark enough to cover seam and hem edges and inner construction but not so dark that it shows through to the right side of the garment. Generally, lining materials such as Nylon cotton, Polyester cotton, silk, etc, are used in leather garments.

Selection of accessories:

Selection of accessories such as buttons, belt buckles, hooks and eyes, zips, etc are done according to buyers or customers choice. Selection of accessories needed for display purposes are done according to the design and style of the garments.

After selecting leathers, linings and accessories, they are sent with the final patterns, to the next unit operations of manufacturing garments.

Chapter 6

Tailoring techniques

Tailoring techniques involve the shaping of the garments depending on the amount of curve need in the garments and design of the garments. Shaping is formed by seams, darts, tucks, pleats and gathers. Facings, interfacings and linings are applied to help the garments to hold their shape. Tailoring techniques are the most important ones without which no garments could be constructed. Different types of techniques are used in garments making out of which pressing techniques, shaping techniques, closing techniques, finishing techniques and stitching techniques are considered to be the most important techniques. One must acquire the skills of tailoring techniques by rigorous practical application before trying to construct garments.

Pressing techniques:

Good pressing can enhance a poorly stitched garment while improper pressing can destroy a well-made design. Each seam and dart should be pressed as soon as it is stitched to give it a clean and crisp finish. Correct pressing opens and flattens seams, hems and enclosed edges without leaving imprints on the right side of the garment. It also sets the shape in curved seams and darts and shrinks out fullness in sleeve caps and hems. The texture, colour and finish of the garment are retained when pressing is done correctly. Pressing leather is quite different from pressing fabrics (**Fig.6-1**).

- Test iron setting on leather scraps.
- Use medium temperature and press from the wrong side, using a press cloth to protect the leather.
- Do not press with steam, which may cause the leather to shrink.
- Press using lower pause-lift motion. Do not slide iron from place to place to avoid stretching the leather.
- Press each seam before crossing another seam.
- Keep seam line perfectly straight when pressing straight seams. Press curved seams and darts on shaped pressing equipment to prevent distorted or stretched lines.
- Allow the pressed areas to cool before moving. If garment must be moved, lift and support it with both hands to prevent the garment from stretching out of shape.



Fig.6-1: Pressing

Garments can be shaped in various ways, depending on the effect desired. It can be cut and joined to create a shape, controlling any extra fullness by means of pointed folds called darts. It can be gathered or folded into tucks and pleats. Underlining, lining and interfacing or interlining, can also shape garments.

Darts:

Darts are one of the most basic structural elements in garments making. Darts are used to shape garment by controlling or removing fullness. Darts are most often used at the bust, back, waist and hips. Accuracy in their position and in their fit is important. There are two types of darts – 1) single point darts originate at a seam line such as underarm bust or waistline darts. They can be straight open or curved in shape and 2) double pointed darts, which are usually straight but can be curved when used at the base of the neck (**Fig.6-2**).

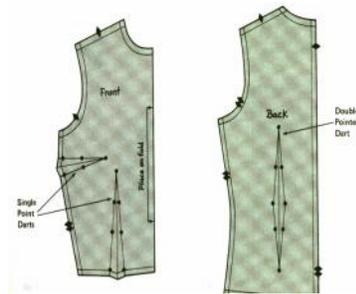


Fig.6-2: Darts

Dart application (Fig.6-3):

- Mark dart and point of dart with horizontal line and fold on the centerline, matching stitching lines and markings at the wide end, the point and in between. Stitch from wide end to point of dart. Backstitch at beginning of stitching line and continue stitching towards the point. Taper to point of dart. And take last two to three stitches directly on fold.
- Raise the presser foot and pull dart towards front. About 2.5 cm. back from point of dart, lower presser foot and secure thread by stitching several times in fold of the dart with stitch length set at zero. Clip threads close to the knot. Press folded edge of dart flat.



Fig.6-3: Dart application

Darts, which are most frequently used, are:

- At the shoulder – to give fullness to the bust
- At the back of the neck or at the back of the shoulder – to provide and ease of arm movement
- At the underarm seam – to control fullness over the bust
- At the elbow of long fitted sleeves – to give elbow room
- At either side of a skirt back – to allow for ease and fullness over the hips and for smoothly fitted back waistline
- At the side of a front skirt – to get gathered fullness

In leather garments, darts are stitched with two or three stitches along the fold at dart point. The darts open are slashed and glued. If topstitching is used in the garment, the darts are also topstitched. If the design features lapped seams, the darts are lapped and stitched. The dart edges are bevelled to reduce the bulk.

Gathering:

Gathering is the process of drawing a given amount of leather/fabric into a predetermined, smaller area, along one or several stitching lines, to create soft even folds. They can be functional or decorative Functional gathers are those that ease in fullness. Gathers used for decorative purposes include shirring and ruffles. Gathering most often occurs in a garment at waistline, cuffs, or yoke, or as ruffles. In case of leathers, gathering becomes bulky and so patterns must be chosen without gathers, when working with leathers.

Gathering application (Fig.6-4):

- Stitch the garment sections together with the gathered section up and stitch. Press the seam allowances together with the tip of the iron.
- Open up the garment and working on the wrong side, press the joining seam into the ungathered section.

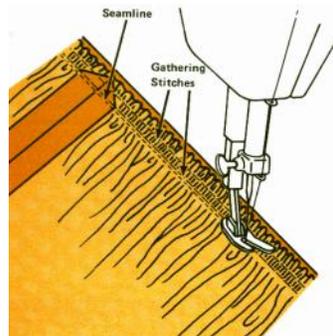


Fig.6-4: Gathering

Shirring:

Shirring is formed with multiple rows of gathering and is primarily a decorative way of controlling fullness. In contrast to gathering, in which fullness is controlled within a seam, the fullness in shirring is controlled over a comparatively wide span. Lightweight garments are the most appropriate for shirring. Shirring is done in cuff and in bodice.

Smocking:

Smocking consists of fabric folds decoratively stitched together at regular intervals to create a patterned effect. The folds may be pulled in when the stitching is done. The smocked section is done before the garment is constructed. It is generally done in yokes, bodices, pockets, sleeves and waistlines.

Ruffles:

A ruffle is a strip of fabric gathered or pleated at one edge, which produces fullness. Though ruffles are decorative, they are also used to lengthen a garment.

Pleats:

Pleats are fold in leather/fabric, which provide controlled fullness. Pleating may occur as a single pleat, as a cluster or around an entire garment section. They are always vertical. There are three basic types – box pleats, which have two folds turned away from each other; knife or side pleats, in which all the pleats are turned to one side; inverted pleats, which have folds turned towards each other and meeting. Accurate marking, stitching and pressing are essential for successful pleats. Pleats may be finished as soft-fold pleats, sharp-fold pleats, topstitched pleats and edge stitched (**Fig.6-5**).



Fig. 6-5: Box, knife and inverted pleats

Pleating application (Fig.6-6):

- Transfer pattern construction marks for pleats and mark the pleat lines on the piece.
- Fold the piece along each fold line to meet the placement line. Stitch each pleat and press the pleats. Turn over the piece and press again for a sharp finish.



Fig.6-6: Pleating application

Tucks:

A tuck is a stitched fold of leather/fabric, which is most often decorative in purpose, but it can also be a shaping device. Two stitching lines that are matched and stitched form each tuck. The fold of the tuck is produced when the lines come together. A tuck's width is the distance from the fold to the matched lines. The width can vary between the tucks. There are three basic types of tucks spaced tucks, which have a space between each tuck; pin tucks, which are very narrow tucks and blind tucks, in which each tuck touches or overlaps the next (Fig.6-7).

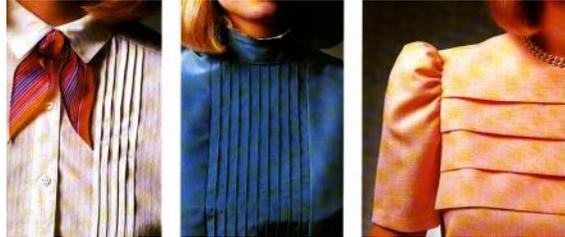


Fig.6-7: Spaced, pin and blind tucks

Tucking application (Fig.6-8):

- Transfer tucks construction marks from the pattern to the garment section and marks the ends of each tuck line. The tuck fold line should be marked as a solid line and the stitching line should be as broken line.
- Working on the right side of the garment, form each tuck by folding on a solid line and stitching on a broken line. Press the folds in one direction and stitch across both ends of tucked section to hold the tucks in the proper direction while completing the garment.



Fig.6-8: Tucking application

Interfacing:

Interfacing is used to give support, shape and stabilize areas, edges and details of the garments. It reinforces and prevents stretching. It helps to keep the garment crisp and fresh looking through repeated wearing. It is used in entire sections such as collars, cuffs, flaps and garment areas such as the front, hem, neck, armhole, lapels and vents. Woven or nonwoven interfacings with or without fusing properties are used. It can be light, medium or heavy in weight. It tends to add some rigidity to the garment. While selecting interfacing, it should give support and body without overpowering the garment. In leather garment, interfacing is needed to maintain its shape as leather stretches. Hair canvas,

woven and nonwoven sew-in interfacings are used. Generally, fusible interfacings are best avoided.

Non-fusible and fusible interfacing applications (Fig.6-9 and 10):

- In case of non-fusible interfacings, pre-shrink the interfacings whereas in case of fusible interfacings, do not pre-shrink it as it may cause the fusing material to come off.
- Trim away interfacing at corners and points to eliminate bulk and turn smoothly. Place the non-fusible interfacing in the garment seam allowance and stitch 3 mm. away from the seam line. Trim the interfacing seam allowance close to the stitching.
- Trim away seam allowances and the corners of fusible interfacing before applying to the garment. Press with the tip of the iron to the interfacing at key points to hold the interfacing in place. Fusible interfacing should completely cover the garment otherwise it will leave visible line on the right side of the garment.

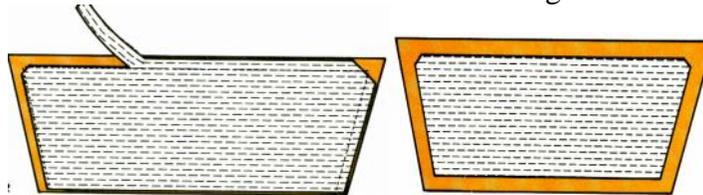


Fig.6-9: Non-fusible interfacing Fig.6-10: Fusible interfacing

Facings:

Facings are pieces of fabric used to smoothly finish edges of garments. They are placed around necklines, armholes, front and back openings of garments, waistlines of skirts and pants. Facings are also used to finish collars, cuffs and pocket flaps. Facings are cut the same shape as the garment section being faced with the exception of bias facings. Shaped facings can be cut as a separate pieces or extensions of the garment section being faced. Fashion fabric is usually used for facings, however, matching lightweight fabric can also be used to reduce bulk at the faced edge. In leather garments, generally leather facings are used on coats and jackets. To reduce bulk and conserve leather, facings are cut on leather garments narrower or replace them with matching fabric. Since leather does not fray, some facings can be replaced with a narrow hem. The seam allowance is folded on the wrong side by gluing and topstitching and secured. On curved edges, the seam allowance is clipped or notched to lie flat.

Facing application (Fig.6-11):

- Fix the prepared facings to the garment edge, right sides together, matching all seams and construction marks. Stitch facing to the garment along the seam line. After stitching, press the seam flat. Trim, grade and clip the seam allowances.
- Press facing and seam allowances away from the garment and from right side, close to the seam line, under stitch the facing seam and turn the facing to the finished position, rolling the seam to the facing side.
- Turn facing to the inside, aligning centre markings and seam lines and stitch. Finish the backs of the buttonholes with the facing or make machine buttonholes through garment and facing.

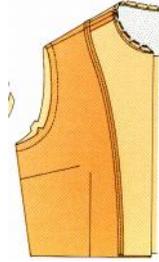


Fig.6-11: Neck and extended front facing

Lining:

Lining covers the interior construction details. It allows the garment to slide on and off easily. It is used in coats, jackets, skirts and pants either entirely or just partially. The lining should be smooth, opaque and durable. Lightweight fabrics such as silk, satin, polyester cotton, nylon cotton, etc. are used as garment lining. The weight, colour and care should be compatible with the garment. In leather garments, lining is used to preserve shape, to reduce clinging and to prevent the colour from crocking on to the skin and other inside garments.

Characteristics of linings:

- Linings are usually smooth and slippery fabrics.
- Linings should be colourfast, static free and wrinkle-resistant.
- Linings should be durable.
- Linings and under linings made from fibres, which breathe, are more comfortable to wear.
- Many lining fabrics ravel badly.

Machine application of lining to jacket:

- Join all lining sections to form a complete lining unit. Sew the sleeves into the armholes, using a double stitched seam.
- Right sides together, match, fix and stitch lining to facing edge. Stitch center back to a point twice the width of the hem from bottom edge. Trim, grade, clip seam and press towards lining.
- Turn the garment right side out and fix the lining to garment in front of both side seams. Stitch to the garment seam allowances 15 cm. above hem. Hem the lining.

Interlining: Interlining is used to provide warmth. It is used in the body of the jacket or coat or sleeves. It must be lightweight warm fabrics such as wool, felt, flannel, polyester fleece, etc. It should not be bulky.

Underlining:

Underlining is used in either in the entire garment or just sections. It gives support and body to garment and design. Underlining fabrics can be light to medium in weight with a soft crisp finish. Colour and care should be compatible with the garment. Underlining reinforces the seam and other construction details. It gives opaqueness to garment to hide the inner construction and reduces wrinkling.. It inhibits stretching especially in areas of

stress. It acts as a “buffer layer” on which to catch hems, tack facings, interfacings and other inner stitching.

Shoulder pads:

Shoulder pads are sometimes needed in a tailored garment to help maintain the shoulder line. They are available in a variety of shapes and sizes. Standard shoulder pads are used to square the shoulders of garments with set-in sleeves. Raglan shoulder pads support the shoulder area for a rounded shaping. Shoulder pads should be large enough to cover the entire shoulder stopping about 2.5 cm from the neckline and extending in front to fill the hollow above the bust. In back, they should be narrow enough to clear the shoulder blades.

Shoulder pad application (Fig.6-12):

- Insert pad and adjust its position with top edge extending 10 mm. from armhole seam line. Fix pad in place along shoulder line. Turn garment wrong side out and stitch edge of pad to armhole seam allowance with a running stitch. Flip up facing and tack shoulder end of pad to shoulder seam allowances.
- Bring facing down, fix and catch stitch the upper portion of the front facing to the top layer of the shoulder pad.



Fig.6-12: Shoulder pad application

Collars:

A finished band of fabric that is attached to the neck edge is called collar. Collars are often the crowning glory of a garment and must be finished with expertise to be complementary. Though collars come in many shapes and sizes, all collars are basically one of three types viz. flat, standing and rolled. A flat collar emerges from the neck seam line to lie flat against the garment rising only slightly above the garment’s neck edge (example – Peter Pan collar). A rolled collar first stands up to the neck edge and then falls down to rest on the garment. The line at which the collar begins to fall is called roll line (example dresses, blouses, coats and sports shirts). A standing collar extends above the neck seam line of the garment either as a narrow single width band or as a wider double width band that will fold back down onto itself (example – shirt collar). A collar has a top and bottom portion, usually called upper and under collar, sometimes the collar and collar facing. The curve of the inner edge is important as it determines the collar’s type (**Fig.6-13**).

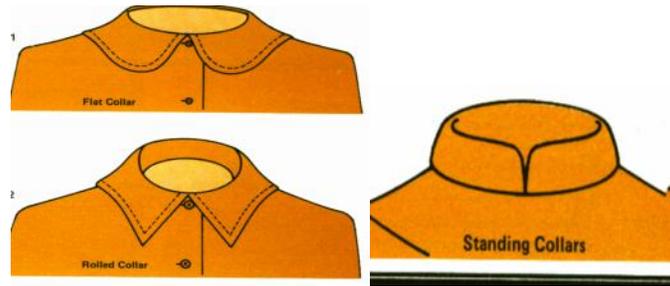


Fig.6-13: Flat, roll and standing collars

Construction of collars:

Flat collar construction (Fig.6-14):

- Apply interfacing to upper and under collar pieces and stitch the two collar pieces together with the given seam width. Trim and grade the seam allowances close to the stitching. Notch or clip curved seam allowances.
- Press seam allowances to the under collar side and pull the seam allowances out into the under collar area and stitch on the right side of the under collar. Turn the collar right side out and press the collar edge rolling the seam to the under collar side. The under collar will extend a bit beyond the upper collar which may be trimmed even with the upper collar neck edge and topstitch the collar edge.

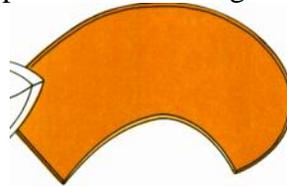


Fig.6-14: Flat collar construction

Rolled collar construction (Fig.6-15):

- Apply interfacing to the upper and under collar pieces and stitch the two collar pieces together. Trim and grade the seam allowances. Trim close to the stitching at each corner. Press the collar to set stitches and press open the seam allowances to the under collar side.
- With collar inside out, pull the seam allowances out into the under collar area and stitch on the right side of the under collar beside the seam. Turn the collar right side out and press the collar edge, rolling the seam to the under collar side. Add shape to the collar by wrapping it around the small end of tailor's ham and steam the collar. Remove the collar from the ham and trim the under collar neck edge even with upper collar neck edge.



Fig.6-15: Rolled collar construction

Collar without a facing:

- Attach the under collar to the right side of the garment, keeping the neck edges even and matching the construction marks. Stitch with the given seam width. Trim, grade and clip the seam allowances and press the seam allowances up into the collar.
- Bring the free section of the collar down over the neckline seam allowance and stitch the collar to the garment edge.

Collar with a front facing (Fig.6-16):

- Prepare and finish front facing and attach the under collar to the neck edge of the garment, matching construction marks. Clip the upper collar to the seam line at each shoulder seam. Position the facing over the collar and fold down the upper collar seam allowance around the back of the collar. Stitch the collar to the neck edge.
- Trim, grade and clip the seam allowances and turn the facing to the inside of the garment. Press the seam allowances up into the collar at the back of the neck. Keep the neckline and collar, as they will be worn and turn under the seam allowance at the back of the upper collar and fix it to cover the neckline stitching.

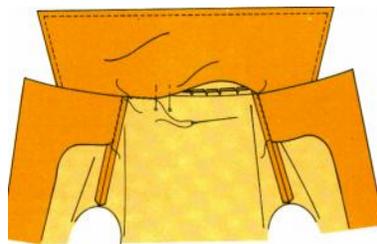


Fig.6-16: Collar with front facing

Waistlines:

A Waistline seam that joins the top and bottom of a garment may be located anywhere on the body between hip and the bust. The waistline may be either closely or loosely fitted. Waistlines seams are not always straight horizontal seams but they may be curved or angled sharply towards the bust or hips. It is generally best to fit the bodice and skirt individually to the body before joining them with the waist seam. Before the waistline seam is sewed, the following steps must be completed: I) Waistline edges on both bodice

and skirt stay stitched, 2) all darts, tucks or pleats made, 3) all vertical seams stitched, seam finished and pressed open and 4) skirt waistline seam ease stitched. Waistline seams should be stayed to prevent stretching. The stay may be applied either before or after zipper insertion.

Joining a bodice to a fitted skirt:

- Turn the skirt to the wrong side and the bodice to the right side. Slip the bodice into the skirt and align carefully matching side seams, center back and all notches. Ease stitch and distribute fullness evenly by avoiding gathers, tucks, or any fullness of either side of centre front and back.
- Stitch the waistline seam from placket edge to placket edge and reinforce by backstitching. Trim ends of darts and cross seam allowances and press seam as stitched. Finish seam allowances by stitching or applying a waistline stay. Pull the bodice out of the skirt and press the seam again.

Waist Bands:

Waistband must be a strong and sturdy outer edge finish as it supports the entire garment. A basic waistband for skirts and pants is cut on lengthwise grain of the fabric where there is least amount of stretch. The waistband is stabilized with interfacing, doubled and sewn to the waistline edge, enclosing the seam allowance. Stretch waistbands are flexible and can be used in woven knit or woven fabrics. They can be made of a combination of fabric and elastic or of decorative elastic. A facing provides a clean, smooth finish that does not extend above the waistline edge. It is made of lightweight fabric and can help to reduce the bulk. In leather skirts, to minimize bulk, grosgrain ribbon facing is used. Leather skirts may also be made with elastic band.

Ribbon facing waistband (Fig.6-17):

- Cut 18 mm. or 25 mm. wide grosgrain ribbon to a length equal to the garment waistline measurement plus 30 mm. Stay stitch garment waistline on seam line and trim seam allowance to 6 mm. Lap wrong side of the ribbon over right side of garment waistline so that the edge of the inside curve of the ribbon is over the stay stitched seam line. Match ribbon ends to placket edges and stitch close to edge of the ribbon.
- Turn the ribbon to inside of garment, allowing garment edge to roll slightly to clear the zipper. Press entire edge of ribbon and tack ribbon to garment at all seams and darts. Whipstitch ends to zipper tape and attach fastener.

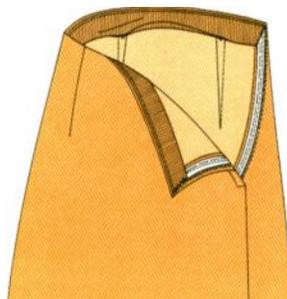


Fig.6-17: Ribbon faced waistband

Elastic waistbands (Fig.6-18):

- Cut garment twice the width of the elastic plus 10 mm. with an extension above waistline and mark waistline with basting. Cut a length of elastic to fit snugly around waist plus 12 mm. Overlap ends and stitch securely. Insert the elastic inside of extension, matching marks of side seam, center back or center front. Place top edge of elastic 6 mm. down from the top edge of the extension and stitch along the lower edge of the elastic.
- Turn elastic and extension to inside garment along stitched edge of the elastic. Stitch along the waistline marking through the waistband, elastic and garment stretching elastic during stitching.

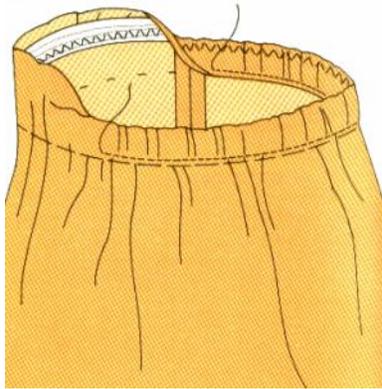


Fig.6-18: Elastic faced waistband

Sleeves:

Today's garments are designed with a wide variety of sleeves, which differ greatly in look and in method of construction. Sleeves must be accurately cut, set and fitted for comfortable wear. They should be cut in such a way that arm can move quite easily. There are three basic sleeves. They are set-in sleeve, raglan sleeve and kimono sleeve. Set-in sleeves are the most widely used type. The set-in sleeve is cut separately from the garment and inserted into the armhole. The length and width of the sleeve can differ but the method of insertion is the same. Raglan sleeve is attached to the back and front of the garment with a long diagonal seam running underneath the arm. Kimono sleeves are usually cut in one piece with the body of the garment. To achieve success with any garment, whether it is sleeveless or made with sleeves, it is necessary to observe the following principles: 1) check garment and sleeve fit and alter the pattern accordingly, 2) transfer all sleeve and armhole markings to the garment, 3) use proper pressing techniques during construction and 4) finish the lower edge of the sleeve before attaching it to the garment.

Set-in-sleeve application (Fig.6-19):

- With garment and sleeve right side out, insert the sleeve into the armhole matching construction marks and seams. Start stitching at one notch, go all around the sleeve, past the starting point and end at the second notch. This gives a double line stitching in the underarm area for strength.
- Trim the seam allowances to 6 mm. between the notches and to 10 mm. around the top of the sleeve. Overcast the trimmed seam allowance between the underarm notches with a wide zigzag stitch.

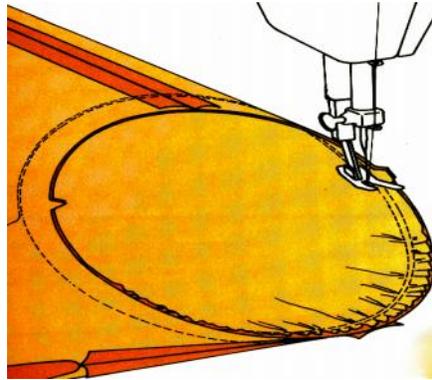


Fig.6-19: Set-in-sleeve application

Sleeve finishes:

The finishing of sleeve edge usually depends on the design. It may be a simple hem or faced finish or double binding or a casing or cuff. In sleeve finishes, the following guidelines are observed: 1) Mark hemline to a length becoming to the wearer, 2) sleeve length helps to determine the total garment silhouette and can easily add or detract from it, 3) Practice good pressing techniques through out the finishing process and 4) reduce bulk wherever possible. A self-hemmed edge is a simple sleeve finish and a facing can also be used. A double binding applied to a sleeve edge gives a decorative finish to the sleeve. A casing sewed at the sleeve edge can be self-faced or it can be separately applied. A cuff can have a placket opening or be loose fitting with no opening.

Faced finish:

- With right sides together, match and stitch facing ends. Press flat and open and trim seam allowances to half width. With right sides together, match and baste facing to sleeve edge. Stitch with facing side up.
- Press seam flat and trim and grade seam allowances. Understitch along facing. Turn facing to wrong side and roll edges in slightly. Attach edge to sleeve and secure.

Cuffs with plackets:

Cuffs are leather bands at the bottoms of sleeve edges. Although cuff styles vary according to the garment designs, the most popular cuff styles are lapped cuff, shirt cuff and French cuff. Each is constructed and applied to the sleeve after the placket opening is made at the sleeve edge. The three most commonly used plackets are the faced placket, continuous bound placket and shirt placket.

Cuffs without plackets:

In cuffs without plackets, the sleeves are cut large so that hand or arm can slip easily in and out. There are three basic styles of this cuff type. They are – straight band cuff, straight turn back cuff and shaped turn back cuff. The straight band cuff is made with a separate cuff attachment to the sleeve bottom, the straight turn back cuff is by turning up the deep finished hem of a sleeve and the shaped turn back cuff is a separately constructed cuff that is attached to the sleeve with a facing.

Lapped cuff application (Fig.6-20):

- With the sleeve inside out, attach the right side of the cuff to the right side of the prepared sleeve edge. Stitch just the upper cuff layer to the sleeve edge with the given seam width. Wrap the cuff facing back around each end of the cuff so that the right side of the cuff facing is against the wrong side of the sleeve. Open up the cuff seam allowances and fold them back around the cuff. Stitch for about 5 cm. along the original seam on both ends of the cuff.
- Close the unstitched portion of the cuff facing by topstitching the top edge of the cuff.

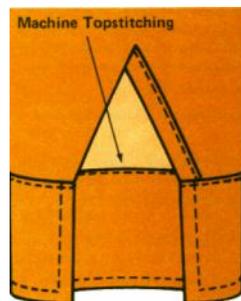


Fig.6-20: Lapped cuff application

Straight turn back cuff (Fig.6-21):

- Apply interfacing between fold line and turn back line and extend interfacing 12 mm. beyond lines for softer crease. With right sides together, match, attach and baste underarm sleeve seam. Stitch, press seam flat and open. Trim seam allowance below fold line to half-width and finish the edge.
- Fold sleeve hem to wrong side along fold line markings and baste close to fold. Form the cuff by folding sleeve to right side along turn back line and baste through all thickness along fold to hold in place. Secure the hem edge with appropriate hemming stitch.

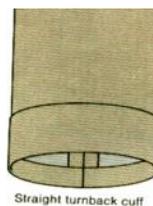


Fig.6-21: Straight turn-back cuff application

Closing techniques:

Pockets:

Pockets make sewing fun. Besides being functional, they add style and interest to all types of fashions. Pockets can be both useful and ornamental. Pockets are generally classified onto patch pockets and inside pockets. Patch pockets appear on the outside of the garment. They can be lined or underlined and attached by machine. They can be square, rectangular, pointed or curved and may be decorated with topstitching, lace or braid trims or construction details such as tucks. Inside pockets are usually made from a lining fabric. They are kept on the inside of the garment and the opening to the pocket can either invisible or decorative. There are three types of inside pockets – the inseam pocket, which is sewed to an opening in a seam; the front-hip or frontier pocket, which is attached to the garment at the waist and side seams and the slashed pocket, which is identified by a slit in the garment, finished with pocket itself or a welt or a flap or a combination of both the welt and the flap. Placement of the pocket on the garment depends on whether the pocket is functional or decorative. In leather garments, all types of pockets mentioned above are suitable but the novelty inseam pocket for a regular or leather lapped seam is particularly attractive. It can be used vertically in a side seam or horizontally in a yoke seam.

Inseam pocket application (Fig.6-22):

- Cut pocket sack from lining fabric. Right sides together, join the pocket sack to the yoke or garment back with a 10 mm. seam. Stabilize the pocket opening on the front section with a piece of seam tape. With garment wrong side up, center the stabilizer over the seam line and attach with glue.
- Right side up, fold the seam allowance under and topstitch the pocket opening so that it will match the topstitch of the lapped seam. Right sides up, baste the garment sections together. Then stitch the seams on either side of the opening, securing the threads with back stitching at each end. Topstitch through all layers to outline the pocket.



Fig: 6-22: Inseam pocket application

Self-welt pocket application (Fig.6-23):

- Cut pocket from lining fabric and fold fabric in half horizontally and press in a crease at the fold. With right sides together, stitch the pocket section to the garment. Turn garment to wrong side and stitch around the pocket, forming rectangle. Cut through pocket at centre of rectangle and at four corners 12 mm. before ends.
- Push pocket through slash to the wrong side and press triangular ends and pocket seam allowances away from the opening. Form a pleat to cover the pocket opening by folding lower pocket section up and stitch folded edge to top of opening. Turn garment right side up and flip up bottom portion of garment to expose lower seam allowances of opening. Stitch through seam allowances and pocket.
- Turn garment back to wrong side and fold upper portion of the pocket down over bottom section. Right sides of pocket should be together and edges even and press open the seam allowances at the top. Turn garment right side up again and stitch around the pocket. Press flat seam-finish edges of pocket.



Fig.6-23: Self-welt pocket application

Belts:

A belt can alter the appearance of a dress. It can make the difference between an ordinary dress and one that is really eye-catching. The width and shapes of the belt are a matter of personal taste and should be guided by size and figure. A larger waist looks better with a narrow belt. A matching belt made of the same dress material will look much better. Different techniques are used in constructing the belts. They are – belt without stiffening, tie belt, belt with interfacing, belt with backing, etc. Belt loops or carriers can be made of thread or fabric. Thread carriers, made from a thread chain, are nearly invisible and are used in side seams of dresses and coats. Fabric carriers may be very wide or narrow, depending on the style of the garment. They can be easily added to a garment either during construction or afterwards. They should be placed around the waistline at strategic points such as side seams and 5 cm. to 7.5 cm. on either side of the center front and back. The carriers must be large enough that the belt can slide through easily.

Sewing a shaped belt (Fig.6-24):

- Cut top and bottom designed fabric straps, using a pattern for the belt and interface them with fusible web. Attach top and bottom facing of the belt with adhesive. Cut piping for the length of the belt and attach the piping at the edges of the belt with adhesive and topstitch the edges close to the piping using a zipper foot. Make loops for the belt, using the same designed fabric. Make a buckle hole at the centre of the belt, using a buckle hole punch. Insert a belt buckle with its prong out through the punched hole. Insert a loop close to the buckle and fold the end of the belt and stitch. Leave 15 cm. from the other end and make 5 to 6 holes, using a hole punch. Insert loops into the belt.



Fig.6-24 sewing a belt

Zippers:

Zippers provide closings on a variety of fashion features. Basically zippers are of three types – conventional, separating and invisible. Conventional zippers are most often used. They are closed at one end and sewn into a seam. Separating zippers are open at both ends and are sewed into a seam that will open completely. The invisible zipper is constructed to disappear into a seam. Like conventional zipper, it has one closed end. All zippers have either chain of metal or plastic teeth or a synthetic coil joined to fabric tapes.

Basic applications for zippers are: i. Cantered – used at centre front or back of garment and at edges of the sleeves, ii. Lapped – used at the left side seam of pants, skirts and dresses, iii. Fly-front – used on women’s pants and skirts, iv. Invisible – used in garments where no visible stitching lines appearing on the right side of the garment and v. Separating - used in jackets, vests or skirts. In leather garments, invisible, slot, lapped and decorative zippers work well. For slot and lapped applications, the seam allowances are glued before inserting the zipper. Drafting tape is used to baste the zipper to the placket. Exposed zippers are particularly easy since leather does not fray. The zipper is glued or taped in place and topstitched.

Separating zipper application:

Finish and press the raw edge. Fold the edges with adhesive and baste the seam allowances. Position and attach the zipper, keeping the pull-tab turned up and the teeth centered over the seam. Topstitch close to the basting on the right side using a zipper foot. Begin at the top and stitch down one side of the zipper. Stitch the other side in the same direction. After stitching, remove the basting.

Cantered zipper application (Fig.6-25):

- Press the finished seam and machine bastes the seam allowances together along the fold lines. Mark the end of the opening. Attach zipper with glue in position with teeth cantered over the seam. Topstitch close to the basting on the right side using zipper foot. Begin at the top and stitch down one side. Turn the garment and stitch across the bottom and up the other side. Remove the basting and finish the ends of the zipper tape.

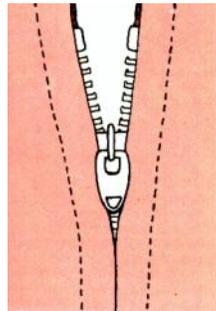


Fig.6-25: Centered application

Lapped zipper application (Fig.6-26):

- Finish and press seam. Working from other side, attach the zipper with glue under the seam opening and baste close to the teeth of the zipper. Lap the opposite seam allowance over the zipper teeth, making sure that they are completely covered. Baste the flap in position 1 cm. from the fold. Topstitch close to the basting across the bottom of the zipper and up along the side, turning at the corner. Remove the basting and finish edges of the zipper tape.

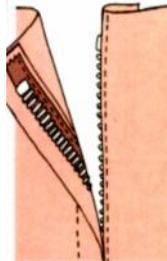


Fig.6-26: Lapped zipper application

Invisible zipper application (Fig.6-27):

- Finish the raw edges of the garment and mark the seam lines with basting. Open the zipper and attach the tapes with glue carefully so that the coils stand away from the tape. This will ensure that the zipper will feed smoothly through the foot.
- Place the open zipper face down on the right side of one garment piece. Position one coil on the seam line with the zipper tape over the seam allowance and stitch as far as the tab of the zipper, using zipper foot.
- Place the unstitched tape face down to the right side of the garment, centering the coil on the marked seam line and stitch, using zipper foot. Replace the special zipper foot with ordinary zipper foot and topstitch the seam.



Fig.6-27: Invisible zipper application

Care of zippers:

- Close zippers before washing or dry-cleaning a garment
- Open zipper all the way when putting on or removing the garment
- Keep zipper closed in garments not in use to help retain the shape of the garment
- Use bees wax or lubricant if zipper becomes stiff
- Set iron at synthetic setting when using coil zipper

Hooks and eyes:

Hooks and eyes are small but comparatively strong fasteners. There are several types of hooks and eyes, each designed to serve a particular purpose. The size of hooks and eyes ranges from fine (0) to heavy (3), which are finished in black or nickel. Special waistband hooks are stronger and heavier and can withstand more strain than those of general-purpose type. Hooks and eyes are used in waistlines and necklines where there might be strain placed on the zipper or button closure.

Hooks and eyes application:

Lapped application:

- Position and stitch the hook close to the edge of the garment. Close the garment and mark where the hook touches the under lapped garment edge. Position the straight eye over the mark and stitch over the holes.

Waistband application (Fig.6-28):

- Position the hook and eye so that the top of the zipper of a pant or skirt does not pull when the garment is worn. Position and stitch the waistband hook and eye as described for the lapped application. Stitch through all the holes of the hook to make it secured.

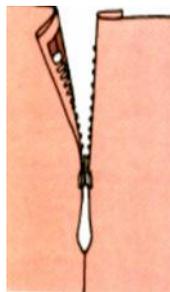


Fig.6-27: Invisible zipper application

Care of zippers:

- Close zippers before washing or dry-cleaning a garment
- Open zipper all the way when putting on or removing the garment
- Keep zipper closed in garments not in use to help retain the shape of the garment
- Use bees wax or lubricant if zipper becomes stiff
- Set iron at synthetic setting when using coil zipper

Hooks and eyes:

Hooks and eyes are small but comparatively strong fasteners. There are several types of hooks and eyes, each designed to serve a particular purpose. The size of hooks and eyes ranges from fine (0) to heavy (3), which are finished in black or nickel. Special waistband hooks are stronger and heavier and can withstand more strain than those of general-purpose type. Hooks and eyes are used in waistlines and necklines where there might be strain placed on the zipper or button closure.

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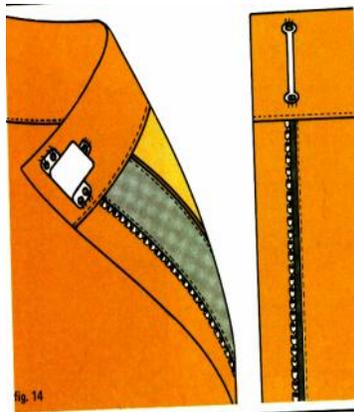


Fig.6-28: Hooks and eyes

Buttonholes:

Buttonholes, required on many garments, can be design features as well as functional. They can be worked by machine or bound. Machine buttonholes can be used on all types of garments. In leather garments, regular bound buttonhole techniques cannot be done because marking can cause damage to the face. Sometimes the markings would not show.

The net result is the bound buttonholes in these materials often do not look like regular bound buttonholes. To make buttonholes in leather, silver-marking pencil is used and the buttonholes are cut with cutting knife using metal ruler as a guide.

Buttonholes should be identical in length and in width. They all should be located the same distance from the edge of the garment. They are usually evenly spaced, however, the spacing may vary on designs. Generally, machine-stitched buttonholes are stitched on an almost complete garment, but they can be stitched at an earlier stage. Automatic buttonholer makes perfect machine buttonholes and this attachment will fit most machines and automatically makes buttonholes of the same width and length.

Buttonhole application (Fig.6-29):

- Interface the buttonhole area and draw a window the exact size at each buttonhole location. Cut the window using a sharp cutting knife. Make the buttonhole welts and right side up, center the welts under the buttonhole. Attach the welts using adhesive and join the facing to the garment.
- Right side up, edge stitch the window to secure the welts and facing.

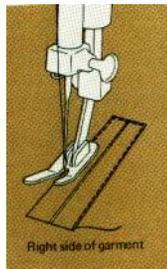


Fig.6-29: Buttonhole application

Buttons:

Buttons help hold garments together adding style or design. The right button can turn an ordinary garment graceful while wrong button can make a garment look plain. Buttons are available in a wide selection of sizes, colors and shapes. Two types of buttons – shank buttons and shankless buttons are used in garments. In leather garments, leather covered buttons are used to match the garments. A zigzag sewing machine can be used to sew the buttons. Reinforcing buttons are useful at points of great strain and on heavy garments.

Applying buttons:

- Mark button locations, using pattern and position the button on the garment. Take enough stitches through the shank to secure the button to the garment.

Finishing techniques:

Seam:

A seam is the basic element in all garments. Perfect seams are the most obvious sign of a well-made garment. Puckered, crooked or uneven seams spoil the fit as well as the look. In addition to holding a garment together, seams can be used as a design element. Most plain seams require a seam finish to prevent ravelling. A seam finish is a way of treating

or enclosing the raw edges of seam allowances so they are more durable and do not ravel. A variety of seams are used in the garment construction. In leather garments making, most commonly used seams are plain, topstitched and lapped seams.

Trimming seams:

Notching:

Where the seam allowance lies on the inside of a curve, a small 'v' shaped cut is made at regular intervals up to the line of stitching. This is called notching and it allows the garment to fit into the curve, giving a smooth finish.

Clipping:

Where the seam allowance lies on the outside of a curve, a 'v' shaped cut is made at frequent intervals almost up to the line of stitching. This is called clipping and it allows the garment to spread out around the curve so that it does not pucker.

Grading:

Grading is used on seam allowances where bulk needs to be eliminated. This often happens where several thickness of layers are used such as on collars and cuffs. The interfacing is trimmed close to the line of stitching.

Plain seams (Fig.6-30):

Plain seams create the shape of a garment and should be almost invisible when pressed. It is suitable for all types of garments. Plain seams are the most versatile and most widely used.

- Cut seam allowances 10 mm to 12 mm. wide and right sides together, stitch on the seam line. Open the seam and press with a lightweight mallet. Apply rubber adhesive to the wrong side of the seam allowances and press the seam allowances with mallet again.

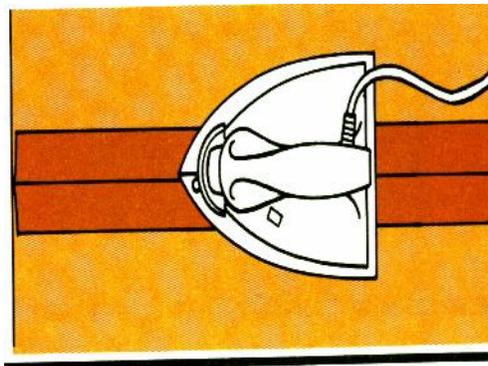


Fig.6-30: Plain seam

Topstitched seams (Fig.6-31):

Topstitched seams are the most versatile, popular and easy decorative seams. By changing the size, colour, kind of thread, number, position and stitch length of the topstitched rows, an endless variety of decorative seams can be created.

- Press plain seam open and topstitch through all the layers from the right side of the garment about 6 mm. from the seam line.

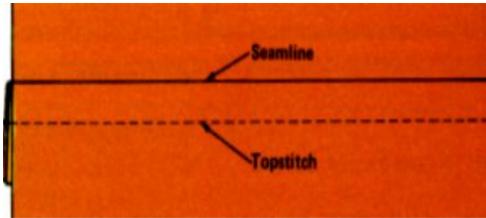


Fig.6-31: Topstitched seam

Lapped seams (Fig.6-32):

For medium and lightweight leathers, lapped seams are the best choice. Generally, seams lap top over bottom, front over back, center over side, bodice armscyes over sleeves, bands lap the adjoining sections, collars lap bodices, bands lap skirts and cuffs lap sleeves. Garment centers lap right over left at the front and left over right at the back.

- Cut no allowance on the overlap but cut 10 mm. to 15 mm. seam allowance on the under lap. Mark seam line on the under lap with a marking pencil. Matching the seam lines, lap the seams and attach with rubber adhesive. Topstitch 3 mm. from the garment edge. On sporty design or outerwear, topstitch again 10 mm. from the edge.

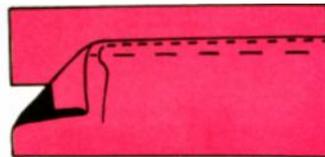


Fig.6-32: Lapped seam

Hems:

A hem is a finish for any bottom edge of a garment and adds final touch to the garment. They should never show on the right side unless a decorative type hem is being used. There are three basic forms – turned-up edge (the most common), faced edge and enclosed edge. Selection of hemming method depends largely on garment style and leather. Whatever be the choice, the following criteria should always be met: 1) the garment should hang evenly and gracefully, 2) there should be no lumpiness in the hem allowance and 3) unless meant to be decorative, finished hems should be totally inconspicuous. In leather garments, hem allowances can vary from 15 mm to 50 mm depending on the garment design and leather weight. If the garment will be lined, machine stitch is done 6 mm from the raw edge of the hem so that the lining will be easier to sew to the leather. The hem is folded in place and pounded to set the hemline. Hems are glued or topstitched. On lined garments, gluing or stitching the hem allowance is done close to the folding line so that the hem edge remains free, allowing to machine stitch the lining. To make a flat and smooth hem on curved edges, triangular notches are cut out. When interfacing the hem, the bias strip can be glue-basted to the wrong side of the leather or machine stitched just inside the hem allowance. For heavy leathers, a

traditional hem is replaced with a cut-edge facing or the hem allowance is trimmed and topstitched through a single layer the desired distance from the hemline.

Hemming leathers (Fig.6-33):

- Mark hemline and trim hem allowance to 5 cm. Apply rubber adhesive over the wrong side of the hem and garment area hem will cover, also under seam allowances. Turn hem up and press. If hem is curved, snip small wedges from the full areas of the hem and bring their cut edges together. Gently hammer the glued portion of the hem with a mallet and top stitch from the right side of the garment. If necessary, stitch with another row of topstitching.

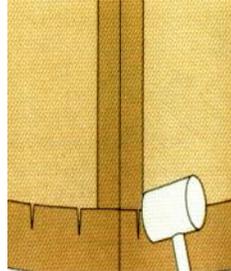


Fig.6-33: Hemming application

Hem width chart:

Skirt	Straight	6.3 cm – 7.5 cm
	A-line	38 mm - 5 cm
	Full	13 mm – 25 mm
Pants		38 mm – 5 cm
Shirts and tops	Tuck-in	6mm – 13 mm
	Pull over	25 mm – 38 mm
Sleeves		25 mm – 38 mm
Jackets and coats	Lightweight	38 mm – 5 cm
	Heavyweight	5 cm – 7.5 cm

Table 6-1: Hem width chart

Stitching techniques:

The most important process in garments making is stitching. The stitching should be done accurately otherwise the results could be disappointing. A variety of sewing techniques are applied for different functions. Some of the important techniques are detailed below:

Backstitching:

Backstitching is used to secure the beginning and end of a row of machine stitching. Backstitching eliminates the need to tie thread ends but it should not be used to secure stitching in such areas as the tapered end of a dart because reversing the stitching direction can distort the garment. It is done by using the reverse stitching mechanism. Position these stitches on top of or just inside those that form the seam. Backstitching must be avoided beyond the cut edge. This will prevent the components being pulled into the hole of the throat plate.

Basting:

Machine basting is a long straight stitch used to hold the layers together during fitting or permanent machine stitching. The longer basting stitches can sometimes be used as a marking line. Basting stitches are produced by setting straight stitch at the longest available stitch length. Machine basting or markings should not be done on fabrics as it may cause damages to it by piercing of the needle.

Blind hemming stitching:

It is a zigzag stitch pattern, which is used for blind hemming by machine. It can also be used to stitch seam finish and to produce the effect of hand-prick-stitching in a machine zipper application. This stitch may either be built into the machine or produced through the insertion of a stitch pattern cam.

Buttonhole stitching:

Buttonholes stitching require zigzag stitching. All machine buttonholes have two straight sides with bar tacks at ends.

Chain stitching:

A series of interlocking stitches made from a single thread (needle thread), the chain stitch can be used for seaming and also as a thread chain for belt carriers and French tacks. When used to stitch on the fabric, it looks like ordinary straight stitching from the top side and a series of interlocking loops on the underside. Unless secured, the stitches can easily be removed by pulling on the thread end. Because of this characteristic, the chain stitch can also be used as a temporary seaming stitch.

Ease stitching:

It is a stitching technique used to control ease around a sleeve ca, at shoulder back and elbows or waistlines.

Featherstitching:

It is a decorative and functional stretch stitch that can be used for fagoting, embroidery or quilting. Most often, it is the featherstitch, set at a 0 stitch width that is used for the straight stitch.

Hemstitching:

Decorative hemming process characterized by threads drawn out above hem allowance. It is done most often with the blind stitch, which may be built in or produced by means of a separate stitch pattern cam.

Overcast stitching:

Zigzag and other over edging stitches that will form stitches over the edge of the garment can be used as overcast stitches. These may be built into the machine or produced by means of stitch-pattern scam. The most basic applications are formation of narrow seams and finishing of seams.

Padding stitching:

Padding stitches are used to hold interfacing to stitch garment parts as under collar and lapel of a tailored garment. Machine stitches show on outside of sections they are applied to. Padding stitches are either plain straight stitch or multi-stitch zigzag stitch.

Running stitching:

It is used for gathering and tucking and for seams, which do not require strength. The running stitches are very short.

Slipstitching:

A nearly invisible hand stitch used to hold two folded edges together or one folded edge to a flat layer of garment.

Stay stitching:

Stay stitching is used to support garment edges and prevent distortion during construction.

Stitch-in-ditch:

It is the technique of stitching in the seam well on the right side of the garment.

Tack stitching:

A **decorative arrowed** triangular tack is used to reinforce small areas of strain. **Bar tack** is a straight tack used for reinforcement at such small areas of strain as the ends of a pocket. This type of tack can be made with a wide zigzag stitch set at a very fine stitch length. **French tack** is free swinging tack used to hold together two separate garment sections while allowing each to move somewhat independently of the other. **Tailor's tacks** are the stitches used to transfer pattern markings to garment sections.

Topstitching:

Topstitching is done from the right side of the garment for decorative or functional purposes. It is a plain straight stitch set at a longer than usual stitch length.

Under stitching:

A line of straight stitching applied along certain seam lines such as neckline facing seams, to keep facing and seam allowances lying flat in a particular direction. This technique of straight stitch is done from the right side, close to the seam line and through all layers and seam allowances. The seam allowances are first trimmed, graded and clipped or notched, then pressed to the side where the under stitching will be placed.

Whip stitching:

Whipstitches are used to join two edges together from the right side. Whipstitches can also hold a raw edge against a flat surface. Space between stitches can be short or long depending upon the jobs.

Chapter 7

Introduction to leather garments manufacturing

In garments manufacturing, advanced techniques are used to change a flat piece into a three dimensional garment with structure and shape. Tailored jackets and coats are molded to body contours with interfacings to create permanent shape in the collar and lapels. In this chapter, only outlines of constructing methods for making a jacket and skirt are given to give an idea how they are made, using techniques of assembling. Sequences for making a leather jacket are given below and in each process, strict quality control is observed (Fig.7-1).

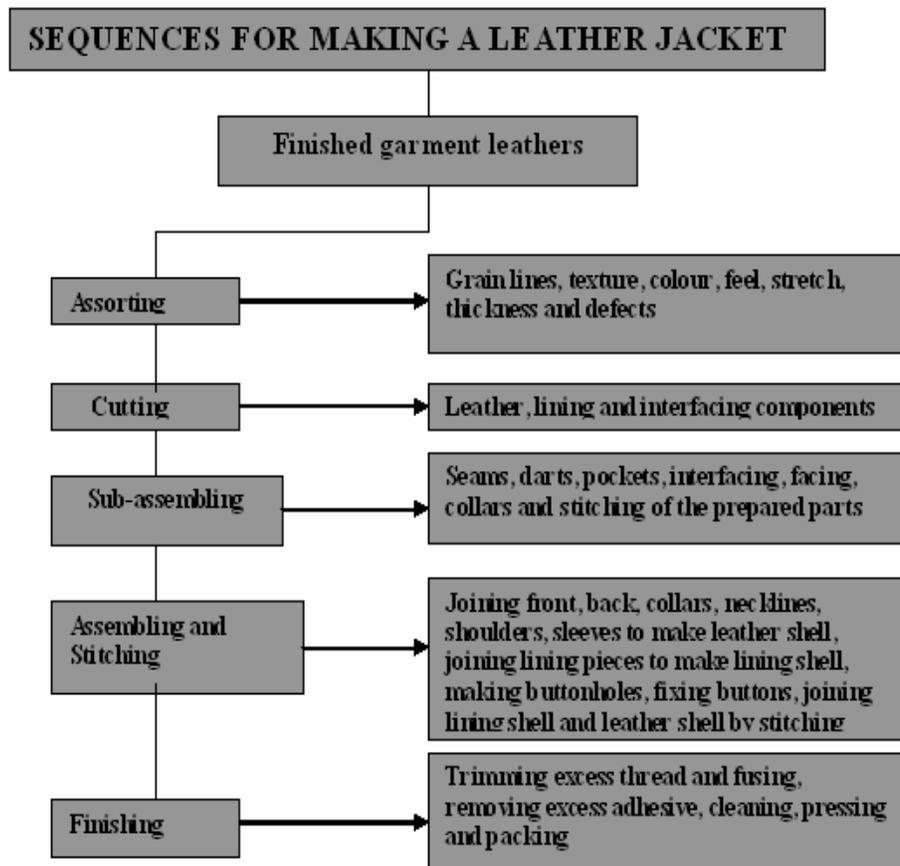


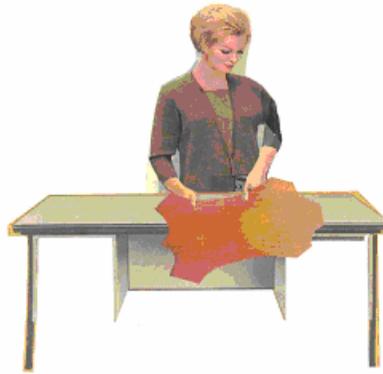
Fig.7-1: Sequences for making a leather jacket

Manufacturing processes:

Leather garments manufacturing processes involve assorting, marking, sub-assembling, assembling and finishing. Once the patterns with constructional details and leathers are received, they are sent for assorting and marking.

Assorting:

Assorting of leathers is done by highly skilled technicians who have sound knowledge about garment leathers and its properties. Leathers are assorted on a wooden table under bright lights and carefully examined for imperfections, holes, scratches and thin spots. Any noticeable defects are marked with a silver marking pencil, which can be easily erased by a piece of soft cloth. Leathers are selected which are most alike in feel, thickness, colour/shade, texture, stretch, grain pattern, etc. After selecting leathers, they are sent with patterns having fabricating details to the next process of cutting.



Cutting:

Cutting of leathers and linings are done by highly skilled cutters. It is a vital process and should not be done in haste. Cutting is done on an inclined table fitted with soft zinc metal sheet or Teflon sheet, which makes the cutting easier and more accurate. It also prevents leathers and linings from sliding and pulling out of shape. Cutting is done by a sharp high-speed hacksaw blade. Accurate cutting is essential for the garment to be assembled correctly and to fit well. The leathers are laid out flat and patterns are arranged to make maximum use of leather by butting up straight edges and putting the pieces very close together. Several arrangements may be tried before deciding which is most practical. Patterns may be arranged in any direction but patterns should be laid with the grain. The pattern pieces are arranged in such a way that the finished garment will fit the way the skin did the animal it came from. Leather does not have a true grain line. Since it has the least stretch and greatest strength in the length from neck to tail, the lengthwise grain is considered to be parallel to the backbone. Generally, the center or back of the animal is most attractive while the legs and belly may be weak and thin. For this reason, center front and center back should be placed along the grain. Smaller pattern pieces can fit in along the edges as needed and can be turned slightly off grain to make the best use of the skin. For rough suede and splits, which have no nap, colour and thickness must be considered when laying out the patterns. In case of suede, the nap direction must be carefully examined. The nap runs generally from head to the tail and from the backbone to the legs. A firm placing of hand on the pattern while cutting gives adequate control. Cutting is done with a sharp high-speed hacksaw blade fitted with handle. Cutting is also

done with sharp shears. Always work with the finished side of the skin facing up. Masking tape is used to attach pattern pieces to the skin for cutting components but the tape should not be left on the skin for too long as it may cause damage to the finish. Cutting pieces in accordance with the grain will promote even graceful draping in garments the most noticeable sections – the fronts, collars and lapels are first cut from the skins. The largest and most important pieces must be cut in the center where the leather is thickest while small pieces must be cut near the edges. Notches are marked on plain seams with small clips. Linings and interfacings are also cut using appropriate patterns. In big garment industries, linings are cut with lining cutting machine. After cutting, the leather, lining and interfacing components are bundled with the constructional details marked at the back of the components and sent for the next unit operation of sub-assembling (**Figs.7-2 and 7-3**).

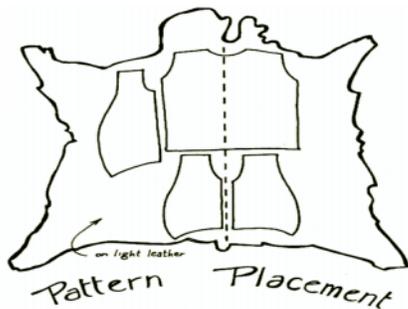


Fig.7-2: Patterns placement

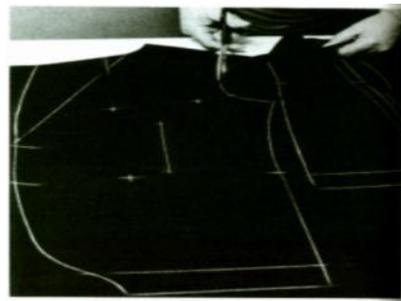


Fig.7-3: Cutting

Sub-assembling processes:

Sub-assembling processes involve pressing, preparing different parts of the garments, fixing closures and stitching before they are sent for main assembling. Shaping of the parts is formed by seams, darts and tucks, pleats and gathers.

Pressing:

Good pressing techniques are just as important to the look of the finished garment as being able to sew a straight seam. Seams should be pressed as they are sewn and body shape should be built into the garment by use of proper pressing equipments. Using the right pressing equipment with correct pressing techniques is essential to shaping tailored garment to fit to body contours smoothly. Pressing is as important as stitching. A press cloth of smooth fabric is buffer between the iron and the garment fabric to prevent overheating, scorching and surface shine. The press cloth is used to retain more moisture for pressing heavy fabric. A cushioned pressing pad prevents flattening raised details, such as bound button holes, pockets and flaps. The iron soleplate is covered with a perforated iron guard for pressing on the right side of fabric without a press cloth. The iron guard is removed and the soleplate is cleaned frequently to prevent corrosion from lint build-up and moisture. Careful step-by-step pressing, connected with trimming, clipping and grading eliminates excess fabric thickness and creates a crisp custom finish. Pressing is to achieve seams, darts, edges and corners that are smooth, flat and thin. They

cannot be achieved if all pressing is left until last or correct trimming, clipping and gathering methods are not used. Pressing is an essential operation throughout the making of the garment if it is to have a fresh and smart appearance.



Fig.7-4: Pressing

Pressing is done by unskilled workers for a variety of functions such as fusing, pressing prepared parts, pressing seams, pressing linings, pressing finished garments, etc.

Seams and darts:

Before starting construction, all internal seams within the main garment sections and all darts are completed. To eliminate bulk from each dart, the dart is slashed through its centre to within 1.2 cm. to 2.5 cm. of its point and pressed (Fig.7-5).

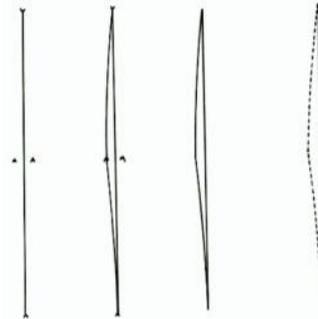


Fig.7-5: Darts

Pockets:

All types of pockets such as patch, welt, flap, slot and inseam are suitable for leather garments. The novelty inseam pocket for leather lapped seams is particularly attractive. It can be used vertically or horizontally and requires one pocket sack to form the underlay.

Sewing inseam pocket:

- Cut one pocket piece from lining fabric and join the pocket piece right sides together to the garment back with a 10 mm. seam and press.
- Stabilize the pocket opening on the front section with a piece of seam tape. With the garment wrong side up, centre the stabilizer over the seam line and stick it with rubber adhesive.
- Right side up, fold the seam allowance under and top stitch the pocket opening so that it will match the top stitching of the lapped seam. Right sides up, baste the

garment sections together and stitch seam on either side of the opening. Topstitch through all layers to outline the pocket.

Sewing welt pocket (Fig.7-6):

A welt pocket is a rectangular piece, cut separately or as a part of the pocket that fits over the pocket opening and is sewed into the lower edge of the slash. Placement of the pocket on the garment depends on whether the pocket is functional or decorative. A pocket to be used should be located in a level that is comfortable for the hand to reach. If a pocket is only for decorative, as pockets above the waist usually are, it should be placed where it will be most flattering.

- Cut one pocket from garment lining on the lengthwise grain and pocket length should be twice the desired depth of the finished pocket plus twice the desired depth of the welt. Pocket width should be equal to that of pocket opening plus 2.5 cm. for side seam allowances. Fold pocket in half horizontally and press in a crease at the fold. With right sides together glue pocket section to the garment, crease at the fold. With right sides together glue pocket section to the garment, aligning crease with marked lower stitching line.
- Turn garment to the wrong side and stitch around pocket forming a perfect rectangular. Carefully cut pocket at centre of the rectangle and stop 1.2 cm. before ends and cut diagonally into the four corners, forming a triangle at each end of the opening.
- Gently push pocket through slash to wrong side and pull on triangles at each ends to square the corners of the opening. Press triangular ends and pocket opening seam allowances away from the opening.
- Form a pleat to cover the pocket opening by folding lower pocket section up and stitch through the fold and folded edge to top of the opening (pleat becomes welt). Turn garment right side up and flip up bottom portion of garment to expose lower seam allowances of opening. Stitch through seam allowances and pocket.
- Turn garment back to wrong side and fold upper portion of pocket down over bottom section. Right sides of pocket should be together and even. Glue around pocket and press open the seam allowance at the top.
- Turn garment right side up again and flip it out to expose the pocket. Stitch around the pocket. Back stitch at beginning and end. Press flat. Seam finish outer raw edges of the pocket.



Fig.7-6: Sewing welt pocket

Interfacing front:

Leather stretches and needs interfacing at most edges. Hair canvas, woven and non-woven sew-in-interfacings are used. Interfacing the garment front builds shape into the coat and contributes to the long lasting good looks of the garment. Front interfacing helps the garment front to drape smoothly over the body, garment edges hang straight and pockets are supported. The shoulder reinforcement ensures a smooth line from shoulder to bust line. The completed lapel should roll back smoothly and curve slightly inward at the lapel points. The lapel roll line is taped with stay tape by machine so that the lapel lies close to the body without gaping (**Fig.7-7**).

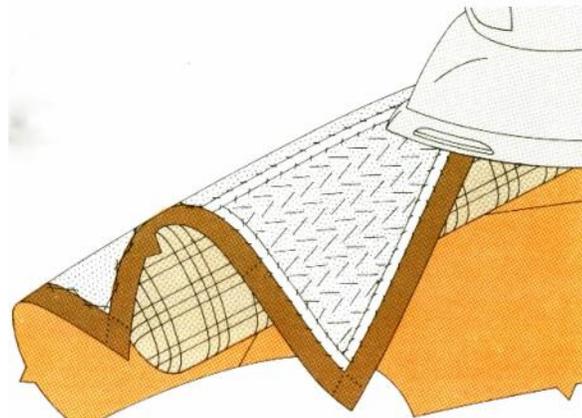


Fig.7-7: Interfacing front

Applying back interfacing:

The back interfacing provides the necessary support for the upper back and underarm of the stitched garment (**Fig.7-8**).

- Construct all darts on the front interfacing. Position the interfacing on the wrong side of the garment, matching all the markings.
- Secure the interfacing to the garment, using long parallel pad stitches. Trim away all the interfacing seam allowances along the neck, shoulder, armhole and side seam edges. Stitch the cut edges to the garment seam allowances.



Fig.7-8: Back interfacing

Facing:

The facing plays a prominent roll in the finished jacket. It must be carefully cut and shaped and laid gracefully over the lapel, with enough ease to allow the lapel to roll freely. If there is no ease, there will be either ripples or strain on the front of the jacket. Generally, leather facings are used on coats or jackets. To reduce bulk and conserve leather, the facings are cut on other garments narrower. Since leather does not fray, some facings can be replaced with a narrow hem. The seam allowance is folded to the wrong side, glued and topstitched to secure. On curved edges, the seam allowance is clipped or notched to lie flat.

The right side of the facing is placed to the right side of the jacket front, allowing 1.2 cm. facing to extend beyond the jacket at the top of the lapel and down the front of the jacket. Beginning at the tip of the lapel, basting is done through the centre of the tape, attaching the facing to the jacket. Just below the bottom of the roll line, about 6 mm. ease is placed to accommodate the roll of the lapel. Machine stitching is done from the collar notch to the bottom of the jacket, using the tape as a guideline. Stitching is done about 1.5 mm. beyond the tape in the seam allowance. The facing and the tip of the lapel are pressed flat (**Fig.7-9**).

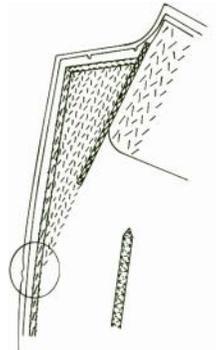


Fig.7-9: Facing

Assembling and stitching processes:

Assembling and stitching processes involve making of garment by joining front and back of the garment, attaching of the collars, shoulder seams, attaching sleeves, joining front, back and side lining pieces, attaching lining shell to garment shell, completion of garment, making buttonholes and buttons fixing.



Assembling the body of the jacket:

- Stitch the jacket backs together at the centre back and then open out the centre back seam allowance. Topstitch 3 mm. from each side of the seam. Stitch the sides back to the jacket back. Press the side back seam allowance towards the centre back and topstitch 3 mm. from the seam.
- Stitch together the jacket fronts and jacket back at the side and shoulder seam lines.

Shaping under collar (Fig.7-10):

- Fuse interfacing to under collar and stitch centre back seam. Trim to 6mm. and press open. Fuse interfacing strip to stand.
- Fold the under collar on roll line and pin it to tailor's ham. Steam to set the shape and do not press a crease at roll line. Dry under collar.



Fig.7-10: Shaping under collar

Attaching under collar to garment (Fig.7-11):

- With right sides together, match and stick under collar to garment along neck seam line. Stitch with the garment side up, securing stitches at both ends of seam line crossing. Press seam flat. Make sure that the distance from the tip of the lapel to the beginning of the collar is identical on each lapel. Trim stitched seam allowances and press the seam over a tailor's ham.

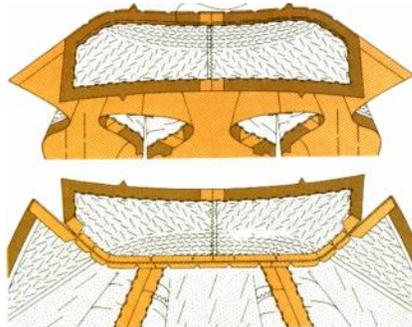


Fig.7-11: Attaching under collar to garment

Applying upper collar facing (Fig.7-12):

- With right sides together, match and attach upper collar to facing along neck seam line and clip facing seam allowance if necessary to collar smoothly. Baste and stitch with facing side up, securing stitches at both ends of seam line crossing. Press the seam flat.
- Trim stitched seam allowances and diagonally trim cross seam allowances. Finger-press seam open, clip facing seam allowance and notch upper collar seam allowance until they both lie flat. Press the seam open over a tailor's ham.

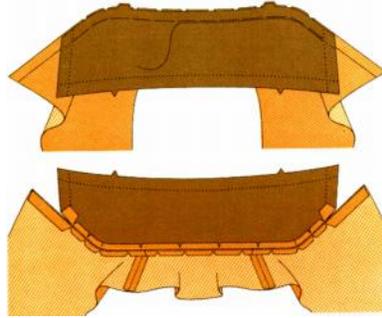


Fig.7-13: Applying upper collar facing

Attaching upper collar unit to under collar and garment (Fig.7-14):

- With right sides together, match accurately upper collar to under collar. Baste in place at the seam line junction of collar and lapel, turn down neckline seam allowances on upper and under collars so that they are not caught in the stitching.
- Starting at centre of collar, stitch around collar by reinforcing stitches at corners. Secure stitches at junction of collar and lapel. Press the seam flat.
- Match, attach and baste front facing to garment along upper lapel edge and front opening. At junction of collar and lapel, lift up neckline seam allowances on garment and facing so that they are not caught in the stitching. Start stitching at upper edges and secure beginning stitches and reinforcement stitches at corner. Press seam open.
- Trim all seam allowances and cut excess at junction of collar and lapel. Clip curves of collar and at the ends of lapel roll line. Taper all corners and press all seams are open. Press collar seams towards under collar, above lapel and below facing.
- Roll slightly seam line along collar and lapel edges towards under collar and garment. Roll the seam lines along front opening edges towards facing and baste them together diagonally.
- Stitch from under collar and garment sides along collar and lapel edges and from facing side along front opening edges.



Fig.7-14: Upper collar attaching

Completion of collar and lapel (Fig.7-15):

- Stitch side seams and with right sides together, match, attach and baste front to back along side seams. Stitch, press seams flat and opens.
- Baste along the roll lines of collar and lapels. Lift up back neck facing and stitch facing and garment neck seam lines together.



Fig.7-16: Completion of collar and lapel

Shoulder seams:

Before stitching the shoulder seams, the front shoulder should be reinforced with a strip of lining. Baste the lining strip to the wrong side of the garment. Baste the front and back of the jacket together at the shoulder seams. Machine stitch the shoulder seam, remove the basting and press the seam open.

Inserting shoulder pads (Fig.7-17):

Shoulder pads are needed to help maintain the shoulder line. They are also useful to distinguish figure faults like rounded shoulders and uneven shoulder heights.

- Insert pad and adjust its position with top edge extending 10 mm. from armhole seam line. Keeping pad in place along shoulder line, turn the garment wrong side out. Stitch edge of pad to armhole seam allowance with a running stitch.
- Flip up facing and tack shoulder end of pad to shoulder seam allowances. Complete shoulder pad application by bringing facing down and catch stitch the upper portion of the front facing to the top layer of the shoulder pad.

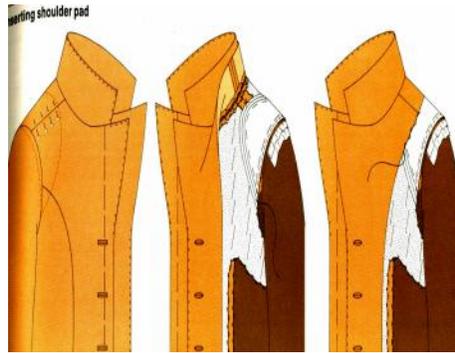


Fig.7-17: Shoulder pad attaching

After inserting shoulder pad, the leather shell is ready for attaching lining shell.

Attaching sleeves to garment (Fig.7-18):

Set-in sleeves in the stitched garment are usually shaped according to one of three basic types –1) standard one piece sleeve with an underarm seam, 2) two-piece sleeve with seams along the front and back of the arm and 3) a variation on the one piece sleeve in which the seam is at the back of the arm. Most tailored sleeves are of the second or third type because their seam positions give a better fit.

- Complete the darts or place a row of ease stitching within the designated markings on the seam line and also sleeve vents.
- Right sides together, complete sleeve seam and press, flat and open. Ease stitch two rows within seam allowance of cap between front and back notches.
- Stitch sleeve into armhole and finish seam allowance with a second row of stitching. Trim close to second stitching line.

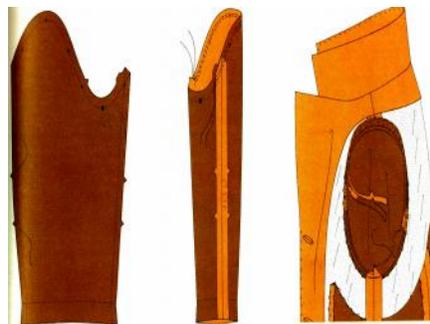


Fig.7-18: Sleeves attaching

Lining:

Lining is the last fabric layer to be added to the stitched garment. The purpose of lining is to hide all the threads and seams and layers of interfacing, which have gone into the construction. It should fit smoothly within the garment, providing a neat, clean inside finish and also help in sliding the jacket on and off without difficulty. The lining is constructed from a smooth fabric that complements the outer leather layer. To ensure sufficient ease for body movement without strain lining seams, there is usually vertical

pleat down the back of the lining and a fold at the bottom of the sleeve and at the garment hem. The lining should be cut slightly larger than the jacket, in both length and width, even though it is placed inside. The constant pulling and friction will cause tears in the lining fabric, if there is not sufficient ease.

Joining main lining pieces (Fig.7-19):

- Stitch darts and baste up the back pleat. Press to one side and tack through all layers with cross-stitches below neckline and at waistline.
- Sew the front, back and side lining pieces together, using the same amount of seam allowance as in the jacket. Leave the shoulder seam open. Press seams, flat and open. Clip and notch the seam allowances.
- The seam allowances on all the stitched raw edges except for the armhole edges should be turned and pressed to the wrong side. Clip and notch the seam allowances so that they lie flat. Baste the turned edges in place.

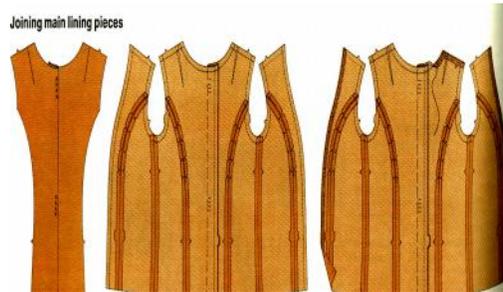


Fig.7-19: Joining lining pieces

After joining lining pieces, lining shell is ready for attaching to leather shell for completion of the garment.

Attaching lining to garment (Fig.7-20):

- With the wrong side of lining facing the wrong side of the garment, match the side seams of the two pieces. Keeping seam lines aligned sew the corresponding side seam allowances of the garment and the lining together with sufficient room around the shoulder and armhole for the sleeve to be set.
- Lap the front shoulder edge of lining over the shoulder seam line to the shoulder pad. Matching armhole of lining and garment together, seam lines are aligned. Baste shoulder edge.
- Attach the back neck edge of the lining over facing, lapping the back shoulder edge of lining over its front shoulder edge and slipstitch. Baste armhole edges and trim lining edge so that it is even with the garment armhole edge.

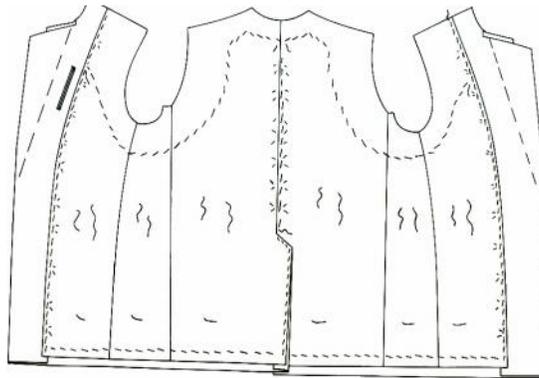


Fig.7-20: Lining attaching

Attaching sleeve lining (Fig.7-21):

- With right sides facing, complete sleeve seam and press open. Stitch two rows of ease stitching within seam allowance of cap between front and back notches. Staystitch sleeve underarm between same two notches.
- Turn both garment and sleeve lining wrong side out. Match sleeves of lining and garment together along seam allowances. Hold the seam allowances together with a long running stitch, stopping from bottom edge of garment sleeve.
- Slip arm all the way through the sleeve lining and grasp the bottom of the garment sleeve. Pull the lining back over the garment sleeve. Pull sleeve lining up over entire garment sleeve. Draw up the ease stitching threads so that cap of sleeve lining fits around the armhole. Turn under seam allowance of sleeve lining, clipping the underarm curve.
- Lap sleeve lining over the basted armhole line and slipstitch sleeve lining.

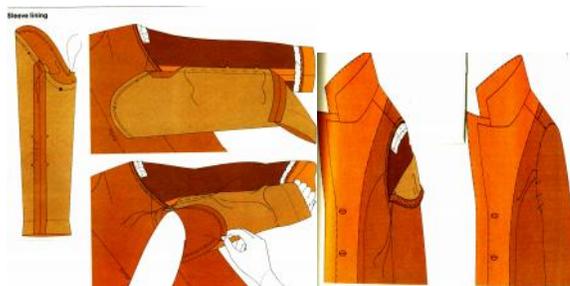


Fig.7-21: Sleeve lining attaching

Making buttonholes (Fig.7-22):

The top buttonhole on a jacket, which has a lapel, should be placed about 1.5 cm. below the bottom of the lapel roll line. The buttonhole begins in from the edge of the finished jacket a distance equal to one half the diameters of the button plus 6 mm. The size of the jacket buttonhole is equal to the diameter of the button plus 6 mm. On the sleeve, the buttonholes begin 3.2 cm. above the hem fold and 1.2 cm. away from the fold edge of the

top vent. The size of the buttonhole is equal to one half the diameters of the button plus 3 mm.

- Cut two strips for each buttonhole for the required width and fold strips in half lengthwise. Apply rubber adhesive to wrong side and fold after drying. Mark the ends of the buttonhole position and mark additional lines above and below the centreline. Draw additional lines 1.2 cm. from each end.
- Cut along the centre of the buttonhole to within 1.2 cm. of the ends. Cut diagonally into each of the four corners. With right side up, fold the garment back to expose the end of the buttonhole. Turn out the little triangle so that it is on the top of the strips and stitch at the base of the triangle on both sides.
- Fold the garment down to expose one side of the buttonhole and stitch exactly on the marked line of the base of the seam allowance. Repeat on the other side of the buttonhole.
- Apply interfacing, trimming it out of buttonhole. Sew facing to garment and trim away the facing inside the stitching lines to open the buttonhole.

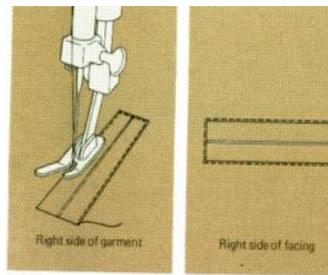


Fig.7-22: Buttonholes stitching

Buttoning:

More than any other closure, buttons allow individualizing garment. Buttons can be decorative as well as functional. Buttons are attached to the garment by attaching a foot and special plate to cover feed or drop feed in the sewing machine. Buttons are positioned and stitched with close zigzag stitching by regulating stitch width and tension.

To mark the button placement on a single breasted jacket, place the two fronts of the jacket together with right sides touching. A pin is placed through the keyhole of the buttonhole to mark the button placement on the left side of the jacket. After final pressing of the jacket, the buttons are sewn to the jacket (Fig.7-23).



Fig.7-23: Buttons stitching

Hemming:

In garment making, hemming is usually a final step. It is a finish for any bottom edge of a garment. There are three basic hems – turned up, faced and enclosed hems. Selection of hems depends upon the garment style and leather. Whatever are the types of hems, it should always be met – i. the garment should hang evenly and gracefully, ii. there should be no lumpiness in the hem allowance and iii. unless meant to be decorative, finished hems should be totally inconspicuous. Attaching the lining to the garment hem, creating a fold for a greater wearing ease, can complete the lining hem.

Turning up the hem edge is very common in leather garments making. In turning up hem, the hem allowance is folded inside the garment and then secured by machine. It is important to check this allowance before cutting out the garment, should a change be desirable. The hem's shape, straight or curved, determines how much should be turned up. As a rule, the straighter the edge, the deeper the hem allowance and the more it curves, the shallower the allowance.

Topstitched hem for bottom finish:

- Mark the hemline and trim the hem allowance. Turn hem to wrong side along marked hemline and hold hem in place with adhesive tape. From right side of the garment, topstitch (6-8 stitches per inch) 1.2 cm. from folded edge. Use the sewing machine gauge for accurate guidance. If needed, stitch another row of topstitching 3 mm. below the first row. With a press cloth below the iron, press the hem with the iron set at low temperature.

Glued hem for bottom finish:

- Mark hemline and trim hem allowance to 5 cm or less. Apply rubber adhesive on the wrong side of hem and garment area hem and also under seam allowances. Turn hem up and fold from centre towards side seams. If hem is curved, snip small wedges from the full areas of the hem and bring their cut edges together.
- When entire hem is complete, gently hammer the glued portion of the hem from the inside with a mallet. After drying, topstitch the folded edge (**Fig.7-24**).

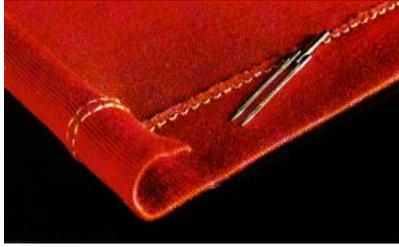


Fig.7-24: Hemming

The finishing of sleeve edge usually depends on the design of the garment. A simple self-hemmed edge is a simple sleeve finish in which a facing can also be used. For a successful completion of any sleeve – I) mark hem line to a length becoming to the wearer, sleeve length helps to determine the total garment silhouette and can easily add or detract from it, ii) practice good pressing techniques through out the finishing process and iii) reduce bulk wherever possible.

Self-hem for sleeves:

- Mark sleeve hemline and reduce bulk at seam line within hem width. Trim seam allowance below marked hemline to half width. Apply rubber adhesive on the wrong side of the hem and garment area hem and also under seam allowances. Turn hem to wrong side along marked hemline and gently hammer with a mallet. After drying, topstitch the folded edge.

After completing garments construction, they are sent for final finishing and quality checking.

Finishing processes:

In finishing, any excess thread found is removed by fusing. The garments are well cleaned and pressed by finishing equipments for enhancing its elegance. The thread trimming system removes loose threads. After finishing, the quality of the garments is checked before packing (Fig.7-25).



Fig.7-25: Finished jackets

Standards for well-stitched jacket or coat:

- Garment has straight, thin edges, sharp corners and smooth curves.
- Front edges as well as finished edges on vents, pocket flaps, lapels and collar points roll slightly inward towards the body.
- Seams and darts are smooth and straight with no obvious crooks or puckers.
- Shoulder seams should be straight and lie smoothly across the top of the shoulder.
- Facing and hem edges are attached so that they do not show from the right side of the finished garment.
- Sleeves hang straight without diagonal in the sleeve cap. It should fit smoothly, comfortably and lie across the end of the shoulder point. The centre sleeve dart should fall at the tip of the elbow.
- The widest part of the waistline dart should fall at the natural waistline.
- Lining has enough wearing ease and so movement does not cause strain on the garment.
- Buttons fit through buttonholes easily and are lifted away from the garment by shanks to prevent strain and wear on the buttonholes.
- Pockets lie flat and fit the curve of the body.
- Skirt hook and eye.

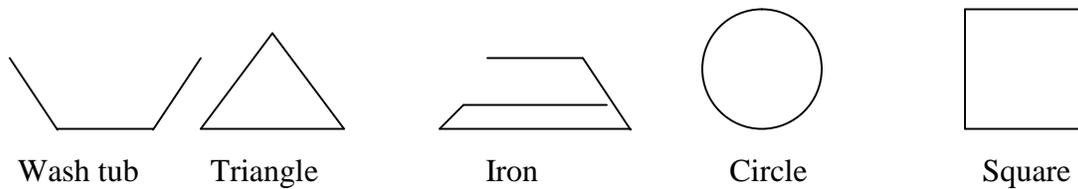
Leather garment care:

- Store leather garments on a well shaped wooden, plastic or padded hangers. This will prevent the garments from wrinkling.
- To keep leather garments soft and supple, keep it in well-ventilated cool dry place.
- Do not use plastic bags or covers for storing garments as they can cause excessive drying.
- Wrinkles and creases in garments generally will hang out. Surface soil and dust can be cleaned with a damp soft cloth or sponge. Mild liquid detergent or saddle soap and water may be used to remove more serious dirt or soil.
- Protect leathers by spraying non-silicone base, as silicone base will break down oils that keep leather soft.
- Use high quality leather lotion on a soft cloth to clean and moisturize finished leathers.
- Allow damp jacket to air-dry naturally away from any source of heat. Apply leather conditioners when leather is nearly dry to restore flexibility.
- To prevent mildew, protect leathers from excessive humidity. In a dry environment, condition leathers to prevent from drying out and cracking.
- Wet fur coat may be hair-dried set at lowest temperature.
- Gently blot up lipid stain. For spot cleaning, use a leather protective and cleaning lotion, which can clean soiled areas and prevent staining. This is applied to all leathers except suede and nubuck leathers.

- To maintain suede and nubuck garments, use a suede brush or fine sand paper to lift up the nap and brush away dirt and spots. In addition, use a terry towel to pick up surface soil and restore suede's luxurious feeling and texture.
- For deeper soils or water-based stains, a water-based product, which cleans without solvents or harsh chemicals, is preferred. Approach professional cleaners for serious stains and problems.

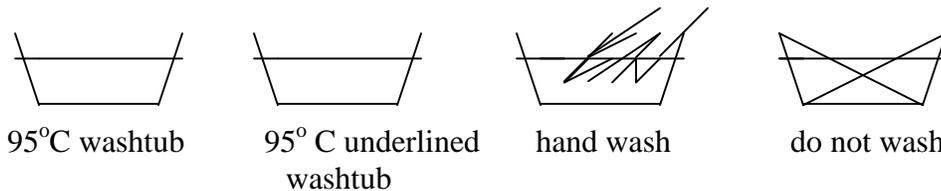
Care labelling code:

The International care-labelling code (washing and caring instructions of a garment) is based on five symbols as given below: Crossing out of any symbol shows the cancellation of that particular process:



Washtub (for washing):

Figure shown in the washtub gives the maximum permissible temperature (in centigrade) used for washing. Sometimes washtub is underlined to indicate delicacy of the fabric. Hand in washtub indicates hand washing of the garment.

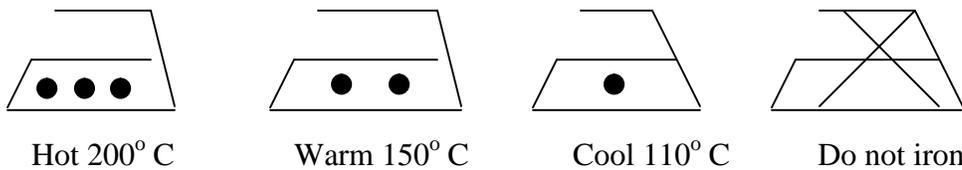


Triangle (for bleaching):

A triangle on the label indicates chlorine bleaching.

Iron (for ironing):

There are four variations of the ironing symbol. First three dots to indicate the maximum permissible sole plate temperature and the fourth show no need for ironing.

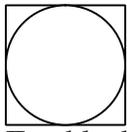


Circle for dry cleaning:

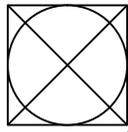
Letters A, P or F placed in circle indicate the type of solvent to be used for dry cleaning. When a circle is underlined, it shows special process.



Square (for drying): The square symbolizes the drying after washing process. There are five symbols of drying as given below:



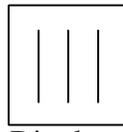
Tumble dry



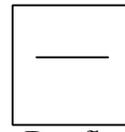
Do not tumble



Dry vertically



Dip dry



Dry flat

Chapter 8

Quality control aspects

Quality control:

Quality: Meet Specification, fitness for use, anything that can be improved, absence of variation, conformance to requirements and bad quality is a social loss.

Control: Preventing defects from happening.

The subjective definition of elements of quality relates to the design, style, colour and aesthetics. Objectively, quality is the ability to meet consistently the return and clearly stated specifications. These are aimed at producing a product suitable for end use and price.

Quality and excellence:

Quality must not be confused with excellence. One could, for instance, set out to produce a low quality product by legitimately using quality control to ensure that the product remains consistently at that quality level and did not drift into the quality higher or lower than that planned.

Quality and productivity:

The competition in the world market has become tough and if a country has to compete effectively in the world market, the products supplied must be of consistent in quality, colour, feel and prompt delivery. Achieving required quality and at an acceptable level of productivity are basic requirements for success. Quality of products can ensure prosperity to the producer by increasing returns, to the consumer with a better product at a price and to the nation with the additional foreign exchange. Quality of any product is determined by judicious application of various inputs such as fittings, embellishments, modern techniques of fabricating, sophisticated tools, equipments, machines and highly skilled artisans.

Parameters of quality:

Quality is an important factor which customer looks for in a product to give total satisfaction. Some of the important parameters of quality are:

Performance:

Product performance must satisfy a customer under normal working conditions by virtue of its ability to achieve the desired results or service.

Features:

Features of the product must be able to offer or give the expected performance easily and comfortably under normal operating conditions.

Reliability:

Reliability ensures optimum performance of product without frequent failures and without any constant attention, adjustment or maintenance.

Conformance:

Conformance ensures the dimension of quality adherence of a product to the stipulated specification or performance.

Durability:

Durability ensures the life span of the product over which it is enabled to offer the optimum performance.

Serviceability:

Serviceability offers an uninterrupted performance of the product by way of prompt and competent service.

Aesthetics:

Aesthetics contributes to the customers' satisfaction.

Perceived quality:

Perceived quality involves the image, advertisements, brand names etc, which influence expectations and confidence of the customer to go for a particular product.

Quality Control Aspects:

It is a system of integrating quality development, quality management and quality improvement. It aims at production of only quality products. For effective quality control, it is necessary to exercise control over the input of materials, process, employment of skilled labourers, management techniques and use of appropriate tools, equipments and machines. Quality control results in elimination of material wastes and ensures in quality product and full customer satisfaction.

Quality Control aspects at various stages:**Line quality control:**

Regular hourly inspections are carried out in the processing line starting from the first operation of selection and inspection of leathers to finished products. The faults, occurring in between the process, are recorded and remedial measures are taken to rectify the defects immediately. Stage quality control: Stages are created viz. first stage, second stage, third stage etc. for regular inspection at predetermined points of problem areas depending upon the need and importance. If defects are noticed in anyone of the stages, the process is stopped for corrective action.

Final quality Control:

The finished products are thoroughly checked for 100% perfection. If the product does not conform to the standards and specifications, the product is rejected.

Acceptable quality level:

Random checks or check as per sampling plan is carried out for acceptable quality level. If the samples do not satisfy the acceptable quality level, they are sent for necessary corrective action. If the samples are found to be good, they are sent for consignment inspection.

Monitoring and inspecting:

Monitoring is vital in providing the data, which shows how well the specifications, are being met. From this data, it is possible to decide the correct items to inspect which operations to check and how frequently this should be done to provide the desired precision of control. The final inspection of these to ensure an acceptable quality of work is by no means quality control. Quality control may, of course, include an element of final inspection and it is essential that this be properly organized and controlled.

The cost quality:

Quality and the cost of attaining it must be measured and evaluated objectively in the same way as other facets of the firm. All cost associated with quality and its control is very important. There are three categories of quality cost that are identifiable:

- Prevention and preparation
- Measurement and analysis
- Failures and rectification
-

After identifying the categorizing of the quality cost, a balance sheet of quality is drawn to establish how much is being spent as the starting point for any evaluation of benefits of the quality operation.

Quality management and specifications:

In quality management, the management must have a considered policy for quality and then make sure that all employees understand it. Supervisors play an important role in workers motivation and in quality control. Though supervisors do not usually spend much time in checking quality, they have a large influence on the level of quality. Leather goods or parts returned by examiners for repairs or replacements should always be routed through supervisors rather than directly to the workers concerned. This enables the supervisor to assess the accuracy of the quality team as well as being aware of shortcomings in the staff. If workers are motivated to increase output by payment by result schemes, this may be at the expense of quality if the incentive scheme is not designed or implemented properly.

Specifications:

Written specifications are essential to ensure that the buyer and seller both understand exactly what is to be manufactured. In many cases, “specifications” are informal. The term “commercially acceptable” is frequently encountered but unfortunately it does not tell the leather goods maker what standards his product should conform to or the leather

garments producer what the leather characteristics should be. Formal specification results in the company being control of the whole operation.

Stage specifications:

- Agree with the customer the specification of the leather garment he wants
- Translate this into the company's technical terminology
- Define specifications for raw materials and accessories
- Define specifications and tolerances for each stage of leather garment production
- Complete the quality manual entry form for the leather garment in question

Specifications must be agreed between the parties concerned, be the buyer and seller or cutting room and sewing room. Specifications, which are too tight, can make the product more expensive than it need be. If they are too loose, they are unlikely to fulfil their objectives. An important aspect of specification is that limits of acceptability are established. Tolerances must be established in such a manner that measures falling outside the tolerance are clearly unusable and must be rejected.

Key areas of quality control:

Quality Control of finished leathers:

Leather being a utility and fashion item, the customer expects the quality of the leather in terms of durability, aesthetic appearance and fashion appeal. The quality of leathers is measured in terms of properties by visual examination. This includes smoothness of grain, colour, uniformity of dyeing, crackiness of grain, softness, fullness and any other defects. The quality of leather is also measured in terms of physical properties such as tensile strength, tear strength, grain crack resistance, water vapour permeability, rub fastness, finish adhesion strength, light fastness, abrasion resistance etc.

Since finished leathers are the raw materials for fabricating leather products, it is necessary to test the quality of the leathers before fabricating. Some of the important tests for selecting good quality leathers are:

Feel:

The feel of leather is tested by feeling up in the palm at different places.

Adhesion to finish:

Scotch tape of 5" is stuck to about 4" on the grain side of the leather and then pressed well. The loose end of the tape is ripped off in one quick motion. The tape is checked to see if any finish is sticking to the tape from the stuck surface of the leather. Poor adhesion of finish can give rise to flaking and peeling of finish in use.

Cracking:

The leathers are double folded at least in 4 places to see whether there is a tendency of pigment or grain cracking.

Dry and wet rub:

The grain side is rubbed vigorously with a piece of white fabric and the cloth is examined for any transfer of finish after rubbing. The cloth is wet and then rubbed on the grain side at some place to find out any transfer of finish on the wet cloth. This involves the assessment of the change in shade of the leather after testing. The degree of change of colour is assessed by using grey scales.

Colour fastness to rubbing – dry 150 rubs – min. 3 grade for upper

- wet 50 rubs – min. 3 grade for upper leather
- dry 50 rubs – min.3 grade for suede leather
- wet 20 rubs – min. 3 grade for suede leather
- dry 50 rubs – min. 3 grade for napa leather
- wet 20 rubs – min. 3 grades for napa leather

Scuff resistance:

The resistance of leather to damage under impact is measured using scuff resistance test.

Strength:

A small cut is made on the butt region and the leather is torn with fingers by pulling strongly on either side. The effort is compared with that required reference of strength. (Min 35-40 kg/cm).

Fading:

In case of white or light coloured leather, the leather piece is kept in the sun for 3 hours and compared it with the original piece for fading (Yellow or change of colour). The performance of leather surface to resist fading to light is compared to a standard wool scale to give a performance rating. Pigment finished systems will usually perform better than aniline dye type finishes.

Water absorption:

A small piece of the leather is dipped in water for 5 minutes and **Bally Permeometer** measures the amount of water absorbed by it. The grain side of the piece is rubbed with a piece of fabric to see physical determinants. Water absorption test is carried out for both upper and garment leathers using **Penetrometer** and the standards prescribed for water absorption test are strictly followed.

Bally Permeometer and Penetrometer for upper and garment leathers to water:

Penetration time - minimum 60 minutes for upper.

Water absorption percentage – maximum 80% for 60 minutes for upper

(The above test is not applicable to garment leathers)

Water repellent:

This test is mainly applicable to clothing leather and measures the shower proof. It is carried out by spraying water on a piece of leather under controlled conditions and comparing the effect with a standard.

Chemical resistance:

Some water is dropped on the grain side of a piece of leather and dried. Later natural rubber adhesive, synthetic neoprene rubber adhesive etc are applied and allowed to dry. The piece is then rubbed with a crepe rubber to see any damage to the finish.

Tensile strength:

It is one of the important properties to evaluate the quality of leather. Good quality of leather is expected to have a minimum tensile strength - min. 20N/mm.square. The value below, which indicates poor quality of leather fibre weave.

Stitch-tear strength:

Stitch tear strength is determined to assess the strength of the leather during stitching of leather components for making leather products. Stitch tear strength of the leather must be 100N/mm.

Abrasion resistance:

It is carried out by using carborandum-coated paper as abrading material and is done using abrasion testing machine.

Elongation at break:

It is the indication that leather can stretch or wear before it is broken. Elongation at break must be 45 – 85%

Water vapour permeability:

This property is important from comfort point of view and is measured for upper, garment lining leather etc by water vapour permeability apparatus Water Vapour permeability (Herfeld) min.300 for upper leathers and 350 for garment leathers. It is a test to determine the amount of water vapour that a material will transmit through its structure in a specified time. This is an important performance measurement for leathers as it will determine the category/type of the leathers and subsequently the performance standards it must need.

Quality control by mechanical operation:

Adhering to strict operational instruction and periodical maintenance of machines, the quality control by mechanical operation is assessed. The mechanical operations in various stages of leather garments manufacturing also influence the quality of leather garments to a great extent. These operations include clicking, splitting, skiving, strap cutting, ironing and a variety of machines used to impart certain desirable properties.

Cutting room:

Since the cost of finished leathers averaging 50% of the cost of the producing leather garments, savings in the finished leathers should always be sought. Quality in cutting room is a vital part of any quality control program and is potentially easier to control because of the smaller number of people involved. But the cost of poor quality control can be extremely serious, as many errors cannot really be rectified. The task of bundling can be an important step in controlling quality by avoiding mixing parts of different sizes and shades.

Quality control of assembling process: The quality of assembling process is assessed by conformity of the products to the standards and specifications.

Sewing room:

Sewing room costs can be reduced considerably through consistently accurate cutting which reduces the need for additional manipulation of incorrectly cut parts. The purpose of deploying inspectors in sewing room is:

- To locate the source of bad work
- To have defective work corrected
- To prevent the production of further defective work

Inspection:

Inspection points are selected according to the method of leather garments construction in use and after analysis of faulty work. Since inspection may not be practicable or necessary at every work place, it should take place frequently enough to keep the cost of repairs involved to minimum. To wait until final viewing can be more costly than a sample check at the right place in the production chain.

Quality control of stitching:

Quality control of stitching is assessed by using appropriate threads, colour matching, stitch appearance, stitch length, specifications (e.g.: stitch per inch) depending upon types of products.

Quality control of finishing:

Quality control of finishing is assessed by final inspection and testing as per laid down sampling procedures. By adopting strict quality control measures during different stages of processing, it is possible to achieve the desired requirements of the finished products as per standards and specifications.

Quality accreditation:

Quality assurance requires not only good quality control but also tangible evidence to show its effectiveness and to convince a potential customer that product quality is under control.

Monitoring quality:

To minimize error during manufacturing, it is essential to check for the required quality, which can be achieved by:

- Inspection during manufacturing
- Analysis of substandard garments
- Analysis of customer returns

Measure defect rate:

It should relate to the number of products involved in the inspection as this enables fault rate comparison at different stages of production.

Defect analysis:

Various inspection/monitoring activities form the basis for decision and action about correcting any faults found and seeking to prevent their recurrence.

Warehousing:

It is a vital area as sloppy packing and paper work or bad warehouse conditions can ruin all the good work done in earlier operations.

Returns to manufacturer:

It is vital to treat every product returned from the customer very seriously. The study reports of returns reveal that good companies dispatch about 5 to 10% of the faulty goods.

Good housekeeping:

Good housekeeping is essential to project the image of the company. Soiled or stained goods delivered due to bad housekeeping will affect the image of the company.

Chapter 9

Projects for making leather garments

Sewing a sky jacket:

Raw materials: Cow Napa, quilted nylon and polyester batting, interfacings, zippers, threads and adhesives.

Quilting the jacket:

- Quilt the jacket pieces by machine basting and fold the centre front and mark the design lines next to the fold and also on the side front seam line, using pattern. Mark the design lines on the side front, back and side back garment sections. Remove the pattern and connect the marks to draw the design lines. Topstitch along the marked lines.
- Fix together the front and side front jacket sections along the side front seam lines and stitch the neck edge to the pocket opening. Back stitch at the top of the pocket opening, bottom of the pocket opening and to the bottom of the jacket. Machine baste the pocket opening marks and clip the side back seam allowance 6 mm. above and below the pocket openings. Press the seam allowances towards the front of the jacket and press open the seam allowances in the pocket area between the clips.
- Turn the jacket wrong side down and topstitch on the jacket front 3 mm. from the side-front seam. Mark the top and bottom of the pocket opening and topstitch another row along the pocket opening on the side front of the jacket (**Fig. 9-1**).



Fig.9-1: Quilting the jacket

Attaching the pocket to the jacket:

- Lay the pocket back section wrong side down. Open the zipper and place it face up along the side seam edge of the pocket section. Align the bottom of one side of the zipper tape with the raw edge of the top pocket section and machine bastes the zipper tape. Turn the pocket front section wrong side down and align the other side of the zipper tape with the side seam edge. Align also the bottom of the tape with the raw edge at the top of the pocket section.

- Machine baste the zipper tape and fold the jacket front section wrong side out along the side front seam with the front piece on top. Align the bottom stop of the zipper and the zipper teeth with the seam. Stitch just inside the line of machine basting between the pocket opening marks.
- Close the zipper and flop the jacket front so that the side front is on top. Stitch between the pocket opening marks and move the pocket away from the zipper. Turn the jacket wrong side down and topstitch 3 mm. from each long pocket edge and across the pocket opening marks. Reinforce the pocket opening with a second row of stitching.
- Turn the jacket front wrong side up and turn both pocket pieces towards the front of the jacket. Trim the raw edges of the pocket sections and stitch the sections 15 mm. from the edge.

Attaching the body to the jacket:

- Stitch the jacket backs together at the centre back, matching the quilting lines. Open out the centre back seam allowance and topstitch 3 mm. from each side of the seam. Stitch the side backs to the jacket back, matching the design lines. Press the side back seam allowance towards the centre back and topstitch 3 mm. from the seam. Stitch together the jacket fronts and back at the side and the shoulder seam lines.

Attaching the under collar:

- Stitch around the neck edge of the jacket 1.2 cm. from the edge. Fix the neck edge of the under collar to the neck edge of the jacket with the wrong sides facing out and stitch. Stitch the centre front of both jacket fronts and on the under collar to hem. Stitch together the under-arm seam of the sleeves and attach the sleeves to the jacket (**Fig. 9-2**).



Fig.9-2: Attaching body and under collar to the jacket

Attaching the lining:

- Sew the lining pieces and stitch the upper collar to the neck edge of the lining. Press the seam allowances towards the jacket. Stitch the under-arm seam on the top sleeve lining. Stitch the sleeve lining to the rest of the lining. With the wrong sides facing, attach the jacket and the lining together around the collar and stitch. Trim the under collar and upper collar seam allowances. Attach the jacket and the lining together, stitch around the hem edges.

Inserting the jacket separating zipper:

- Turn the jacket to the outside and topstitch to the folded edge from the opening in the collar to the hem. Topstitch the lining next to the folded edge

- From the opening of the collar to the hem. Turn the jacket wrong side down, separate the zipper and insert the top end of the tape into the stitched portion of the collar.
- Align the top stop with the collar opening and the folded edges of the jacket and lining so that the folds just cover the teeth. Baste the zipper in place, topstitch the zip tapes on either side from the hem to the collar opening.

Finishing the jacket:

- Topstitch around the folded edges of the sleeves. Topstitch around the upper collar. Stitch the upper and under collars together along the neck seam between the shoulder seams. Topstitch around the hem with two rows of stitching.

Sewing a basic plain skirt: (Fig.9-3):

Rae materials: Cow napa/sheep napa/suede, zipper, hook and eye, threads and adhesive.



Fig. 9-3: Plain skirt

- Lay out the patterns and cut the front and back of the skirt and on the wrong side of the fabric, make markings for darts, bottom of the zipper, vent expansion from waist to bottom of the skirt, the top of the vent and the hem fold line.
- Cut the skirt lining 3 mm. larger than the skirt pattern at the waist and side seams. Prepare the front and back waistline darts and press darts towards the side seams. Baste the centre back seam from the waist to the bottom of the skirt. Machine stitch the centre back seam from the waist to the top of the vent. Machine stitch the centre back seam of the skirt lining in the same way as the skirt back. Press the centre back seam open and then to the left side of the skirt. Press back 1 cm. along the edge of the top layer of the vent, tapering to nothing just above the top of the vent. Stitch a diagonal from the top of the vent down, across the vent extension.
- The pockets are prepared and stitched to the skirt at the waist. Stitch the side seams of the skirt and lining separately and press the seams open. Place the opened zipper at the skirt back. The metal zipper stop should be placed just below the bottom of the seam opening. Only the zipper teeth should be visible along the edge of the fold. Close the zipper and place 3 mm. over the back fold at the waist. Baste the zip from the bottom of the skirt in place along the front zipper tape. Open the zipper and continue backstitching along the zipper tape up to the waistline.

- Add piping along the bottom edge of the skirt as a finish for the hem. Press the piping and press the hem up along the hem fold line. With wrong sides touching, fix the lining and the skirt together at the waistline, matching side seams and centre front and back. Baste the lining fold along the zipper tape.
- Baste the skirt back and the lining back together along the centre back seam, placing small ripples of ease in the lining from the waist to the top of the vent. Fold and baste the lining along the edge of the vent 3 mm. from the edge. Beginning about 2.5 cm. below the top of the vent, slash the top layer lining horizontally just passing the vent opening. Fold and baste the lining along the right side of the vent. Fold the top of the vent lining on the diagonal.
- The bottom edge of the skirt lining is now placed about 2.5 cm. below the hem fold line of the skirt and stitched. Turn back the piping and hemstitch and fold the excess lining down on top of the hem and press the fold. Stitch along the edge of the lining and slipstitch the hem at the vent edge.
- Construct the waistband and fix it to the skirt with right side touching and matching side seams and centre front and centre back. Baste the waistband to the skirt distributing the ease evenly. Using a ham, steam press the skirt waistline to eliminate any ripples or puckers of ease. Stitch along the garment waistband and press the seam allowance up towards the waistband. Attach a skirt hook and eye.

GLOSSARY

Align – To match raw edges, pattern or match points.

Allowance – Extra fabric outside the seam line or within the garment to accommodate gathers, tucks, shirring or bloused effects.

Appliqué – To apply designs to the surface of another fabric.

Appliqué scissors – scissors designed to trim close to a stitched line.

Armhole – Armhole

Arrow tack – A small triangular tack used on tailored garments as reinforcement stay at the ends of pleats, vents, pockets.

Backstitch – To secure the threads at the beginning and end of a seam.

Bands – Strips of fabric, ribbon or bias applied to edges or set into garments to finish or decorate. They may be cut on the bias or straight of grain.

Bar tack – To reinforce areas of stress by hand or machine (end of zipper, end of Buttonhole, pocket openings).

Basic pattern – A pattern printed on non-woven fabric or paper assembled and altered for correct garment fit. Used as a guide to compare with other patterns to make correct pattern alterations.

Baste – To hold fabric layers together temporarily.

Beading – A narrow open work insertion through which ribbon can be run. It is usually placed between fabric edges.

Bias – Any cut that is not on the lengthwise or cross grain. True bias is a line at
A 45-degree angle to the lengthwise grain.

Bishop sleeve – A long sleeve wide at the bottom and gathered into a band.

Blanket stitch – A decorative edge finish formed by looped interlocking stitches.

Blind stitch – A form of hemming made by catching only one thread of the outer fabric.

Bodkin – A blunt needle with an eye or a pin on the end used for threading tape, elastic or ribbon through beading or casing.

Boning – Stiff piece of bone, plastic or metal used within a seam or along a dart to give added support or fit in a bodice or hip area.

Bound pocket – Inserting pocket with two equal welts.

Box pleat – Two side pleats which turn away from each other.

Braid – A woven novelty trim finished on both edges and comes in cotton, wool, rayon and nylon in a variety of widths and weights and can be applied by hand or machine.

Bridle – A strip of pre-shrunk tape that is applied behind the break line of a lapel to prevent stretching.

Butt – To match the edges or folds so that they touch.

Catch stitches – Used to hem garments and to secure pleats and lapels. Also called cross-stitches

Casing – Hem or tuck through which elastic or ties are threaded

Chain stitch – To stitch one fabric or garment section to another without cutting the threads (continuous stitching).

Clapper – A wooden tool used in pressing.

Clean finish – A method for finishing the raw edges of hems and seams.

Clip – A short cut into the seam allowance of a garment, which allows a corner or a curved area to turn and lie flat.

Cording – Narrow corded piping inserted into a seam

Crease – A folded line pressed into the material.

Crimping – Technique for easing fabric into seam line. Sometimes called ease-plus, stay stitching plus.

Cross grain – The filling threads, which run from selvage to selvage

Custom finish – Professionally perfect in its fit and construction.

Dart – Stitched fabric fold, tapering at one or both ends. Used to shape the flat fabric to the contours of the figure.

Design ease – Amount of ease allowed by the pattern designer to make the garment loose enough and fashionable.

Diagonal basting – A temporary stitch used to hold two layers of fabric together without slipping.

Ditch-stitch – Technique of stitching inconspicuously from the right side in the well

Drape – Soft folds of fabric controlled by pleats or gathers.
or a seam or next to a seam line.

Ease – When one section of a seam is slightly fuller than the section to which it is joined, the fullness is distributed evenly without gathers or puckers and pressed so that the threads within the fabric are crowded closer together. This ease allows shaping for curved areas such as the bust in princess line, set-in sleeves, etc.

Ease basting – A temporary stitch used to ease excess fullness into a seam line.

Edge stitch – Topstitching 2 mm. from the edge or seam line.

Enclosed seam – Seam enclosed between two layers of fabric.

Facing – Piece of complementary, lining weight or self-fabric applied to finish the edge. Generally, it folds to the underside but it can fold to the right side.

Fagoting – A trim placed between seams. It is either handmade or commercially purchased as tape.

Fastenings – Hooks, eyes, snaps, buttons, zippers, etc. used to close the garments.

Featherstitch – Blanket stitches that are slanted to create a decorative pattern.

Fell stitches – Neat vertical stitches used to close seams from the right side,
to appliqué, to baste difficult-to-stitch seams and to finish bands
and bindings.

Fish Dart – A dart that tapers at both ends, generally used at waistline.

Flat-fell – Seam used on shirts, slacks and other tailored garments in which one seam is trimmed and the other stitched over it. Gives a flat finished seam on both sides of the garment.

Fly front – Closing that conceals buttons or zipper, usually associated with men's pants and top coats

Fly placket – Any placket which conceals the fasteners – zipper, hooks and eyes or buttons.

French seam – A double stitched seam that looks like a plain seam on the right side and a small neat tuck on the wrong side. Used on straight seams and as a finish for sheer fabrics or infant's clothes.

Fusible web – A web like material, which melts when applying heat and moisture.

Gathering – One or two rows of stitching either hand or machine that are drawn up to form even fullness.

Garment shell – Outermost layers of the main garment sections, excluding hems and facings.

Gather – To pull excess fullness into a seam line.

Gauge stitch – to stitch accurately, using a stitch gauge.

Glover's needle – Needle with a wedge point used for sewing leather and fur.

Glove stitch – Decorative topstitching made by taking the same size stitch on both sides of the work.

Gorge line – Diagonal seam line which joins the collar and lapel.

Grading – Reducing bulk of enclosed seams by trimming the individual seam allowances, different widths, clipping inward curves and corners, notching convex curves and trimming away excess fabric at outward corners.

Grain line - Generally refers to lengthwise grain.

Gusset – A small triangular or shaped piece of matching fabric set into a slash or seam to give added ease and shaping. Usually, placed at underarm.

Ham – A ham-shaped cushion used for pressing or molding shaped areas and curves.

Hem – An edge finishes formed by folding back the raw edge and stitching it by hand or machine. The depth of the hem and the method of stitching depend on the garment and type of fabric.

Hemline - The lower edge of the garment.

Honeycomb stitch – A basic smocking stitch worked alternatively on two rows at a time. Fits smoothly over curved areas since it tends to spread and close like an accordion.

Interfacing – Fabric placed between the garment and facing to add body, strength or shape.

Interlining – Fabric layer applied to the wrong side of the garment or lining for warmth.

Inverted pleat – Two side pleats, which turn towards each other.

Kick pleat – A short pleat at the lower edge of the skirt. It is formed by an extension cut on the center or side seam and is topstitched across the upper edge to hold it in place.

Kimono sleeve – Bodice and sleeve cut in one piece with or without a shoulder seam.

Knife pleats – Series of pleats that turn in the same direction are usually equal in width and are pressed straight to the hem.

Lapel – Turned-back facing at garment edge between the first button and neckline.

Lapped seam – A seam used for yokes and applied pieces such as gussets. One seam allowance is lapped over the other seam allowance and topstitched.

Layout – The way the pattern pieces are placed on the fabric for cutting. The pattern guide sheet has diagrams showing the easiest and the most economical way to place the pattern pieces on the fabric for each width of fabric, pattern size and pattern view.

Lining – fabric used on the inside of the garment to conceal the construction.

Lockstitch: Stitch used to secure thread at beginning and end of stitching, made by releasing presser foot and stitching in one place several times.

Loop – A fastening, which extends beyond the finished edge, used on closings with no lap. Can be made of thread, cording or fabric.

Machine basting – A long machine stitch used in place of hand basting. Can be pulled out easily.

Miter – To join two edges at an angle of 45 degree. A diagonal seam at a corner.

Nap – The short fibers on the surface of the fabric that have been drawn out from the yarns of the fabric and brushed in one direction.

Notches – Match points on the cutting lines of the paper pattern.

Notions – Sewing supplies and equipment needed to complete the garment.

Overcasting stitches – Used to finish the raw edges of seams and hems on fabrics.

Overcast or over edge foot – Special machine foot which holds the fabric flat during stitching.

Pad stitches – Use to shape tailored lapels and collars. Padding stitches are small diagonal stitches.

Picot – An edge finish made by cutting through a line of machine hem stitching.

Pin tucks – Tucks pressed on a thread of the goods and stitched close to the edge.

Pinking – A notched seam finish cut with pinking shears.

Piping – A fold of bias fabric, ribbon or braid inserted in a seam.

Pivot – To turn the fabric with the needle inserted into it.

Placket – Any finished opening in a garment.

Plain seam – The stitching together of two pieces of fabric placed right sides together.

Pleats – Folds of fabric used to control fullness in a garment.

Quilting – Stitching several layers of fabric together in an all-over design.

Ravel – To draw yarns out from along the edge of the fabric to form fringe.

Roller foot – Special machine foot that grips top fabric and reduces under layer creep.

Rotary cutter – A cutting tool with a round cutting blade.

Ruffle – Decorative fabric band, gathered or pleated at the edge or in the center before it is sewn into the garment.

Running stitches – Used for gathering and tucking and for seams, which do not require strength. Running stitches are very short.

Saddle stitch – A decorative topstitch made by taking longer stitches on top and shorter ones underneath.

Sag – The effect of strain on any part of the garment.

Satin stitch – Zigzag stitch of any width with a very short length.

Scallop – An edge finish made up of a series of semicircles.

Seam line – Stitching line.

Seam allowance – The fabric edge that extends beyond the stitching line. The normal seam allowance in all patterns is 15 mm. unless it is marked and printed otherwise on the pattern.

Seam finish – The finish applied to a raw edge to control fraying and raveling.

Seam roll – A long, firmly padded cylinder that is used for pressing seams.

Selvage – Finished edges on each side of a woven fabric, runs parallel to the lengthwise grain.

Shirring – Two or more rows of gathers.

Slash – An even cut in the fabric along a straight line. Slashes are usually finished with a seam or facing.

Sleeve board – A small, narrow, well padded board for pressing sleeves.

Sleeve heads – Narrow strips placed at the top of the sleeve cap to support the cap and make a smooth line.

Slip stitches – Slipstitches or ladder stitches are used to join two layers from the right side of the fabric.

Slot seam – A seam, which has an underlay of fabric and resembles an inverted pleat.

Smocking – A decorative way of gathering a piece of fabric into regular folds done before the garment is made up.

Stabilized seam – Seam stabilized with high-weight selvage or seam tape.

Stay – Strip of lightweight selvage, seam tape, twill tape or bias tape to hold the seam.

Stitch-in-ditch – See ditch-stitch.

Stay stitch – To straight stitch a single layer of fabric just inside the seam line.

Steam press – To press a garment using steam produced by moisture and a hot iron to remove creases raise nap in pile fabrics and shrink out fullness in woolsens.

Swatch – Small fabric piece.

Tack – Permanent stitches to hold fabric layers permanently.

Topstitch – To stitch on the right side of the garment.

True bias – A line midway between the wrap and filling threads. A 45-degree angle from both.

Tucks – Straight folds of fullness evenly stitched.

Twill tape – A woven cotton tape used as a stay drawstring or ties.

Under lap – A part of the garment that extends or laps under another part.

Underlay – An additional piece of fabric placed under a section for the purpose of joining as in a pleat or slot seam.

Underlining – Fabric layer applied to the wrong side of the garment fabric before the seams are sewn.

Under stitch – Technique of stitching by hand or machine through the facing and seam allowances.

Vent – A lapped finished opening on the hem edge of a sleeve, jacket or skirt.

Warp – Threads parallel to the selvage.

Well of the seam – The seam line on the right side of the fabric.

Welt – Visible part of a bound buttonhole, bound pocket or welt pocket.

Welt pocket – Inset pocket with one band on the outside of the pocket.

Whipstitching – Stitching two finished edges together securely with tiny slanting stitches.

Zipper foot – Special machine foot with one toe, which allows stitching close to or on top of a raised edge.

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