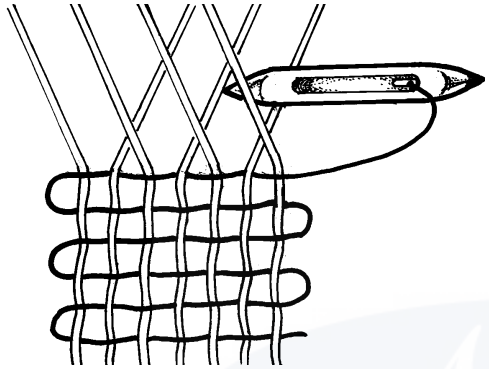
Fabric construction

Objectives: At the end of this lesson you shall be able to
- **explain fabric construction.**

Construction of fabric: Woven fabric is constructed by two groups of yarns known as lengthwise and widthwise yarns.

Weaving is inter-leaving of 2 sets of yarns, warp and weft, at right angles. The **warp yarn** is tied to the loom in length direction. The **weft or filling yarns** are inserted at right angles to the warp. (Fig 1)

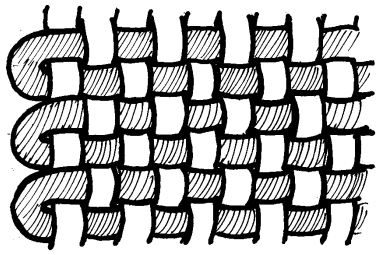
Fig 1



CT11011E

The simplest type of fabric construction is the **plain weave** in which each weft yarn goes alternately over and under each warp yarn. On the sides of the woven fabric, the **selvedge** runs lengthwise as a ribbon like or fringed edge. (Fig 2)

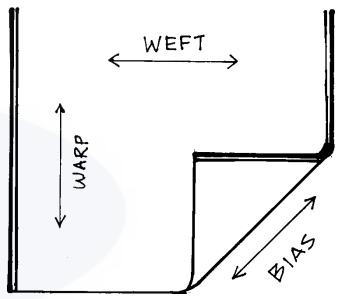
Fig 2



CT11011F

Grain of fabric gives the direction of yarns. The warp running parallel to the selvedge forms lengthwise grain. Crosswise (widthwise) grains are formed by weft yarns running perpendicular to the selvedge. The direction oblique to selvedge is called bias. True bias is at 45 degree. (Fig 3).

Fig 3



CT11011G

Sources and features of fibres

Objectives: At the end of this lesson you shall be able to
- **name the source of different fibres**
- **list the features of fibres.**

For a successful sewing knowledge of fabrics is important. Fabrics are available in a variety of weaves, textures, colours and designs. It is essential to know whether the fabric is suitable for use, whether it is worth your expenditure of time and money. Here are some fabric facts that will help you to select the fabric best suited for your requirements.

Fabrics are made up of **fibres**, either natural or man made. These fibres are spun into yarns and woven together on various types of looms.

Each fibre has its own characteristics which can be changed partly by spinning, weaving and finishing, but even then, the original characterstics are still evident.

The fibre, its main characteristics, and the care of these fabrics can be seen in the table given at the end of the lesson.

Man made fibres are mainly synthetic fibres not found in nature, but gained from a chemical solution. Natural fibres are cotton, linen, silk and wool; except the silk yarn the natural fibres are of short length, called **staples**. These staples are twisted (spun) to a long **yarn**. (Fig 1)

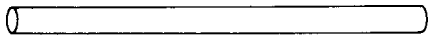
Fig 1

CT111011

Longer staples make high quality yarn, more expensive but also more durable. Fabrics made from these high quality yarns are called “combed” in case of cotton material and “worsted” in case of wool. The number of twists affects appearance and durability. A yarn with many twists is stronger and will produce smooth-surfaced fabrics.

A filament yarn is a strand of several meter length either extruded from a chemical solution of which man made fibres derive or it is unreeled from a silk worms cocoon. Filament yarns are smooth, fine and slippery. (Fig 2)

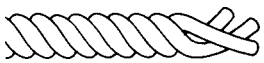
Fig 2



CT111012

Yarns can be used alone or two or more yarns may be twisted before weave (ply yarn). (Fig 3)

Fig 3



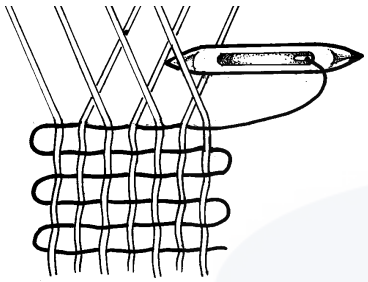
CT111013

Basic types of weave

Objectives: At the end of this lesson you shall be able to
- **explain and sketch the features of the basic types of weave.**

The rectangular interlacing of yarns is called **weaving**. **Warp yarns** are tied to the loom and filled by crosswise or **weft yarns**. (Fig 1)

Fig 1

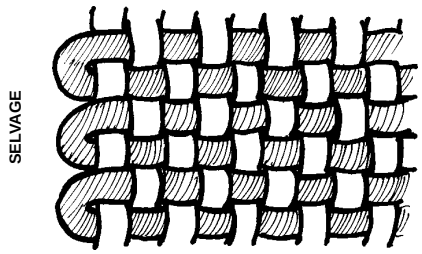


CT111021

The final weave structure will depend on the way in which the warp and weft yarns are interlaced. There are three basic types of weaves. Most of the other types are variations.

Plain weave is the simplest and most common type of weaves. The horizontal threads (weft or fillers) pass alternately over and under successive vertical threads (warp yarns). Muslin or Taffeta are examples for this type of weave. (Fig 2)

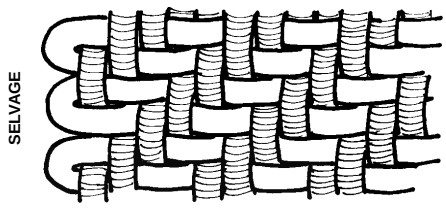
Fig 2



CT111022

Twill weave is woven more closely than the plain weave. The warp and weft threads are interlaced to form a ridge or rube on the face of the fabric. On each successive line the weft moves one step to right or left. Examples are Denim and Gabardine (Fig 3)

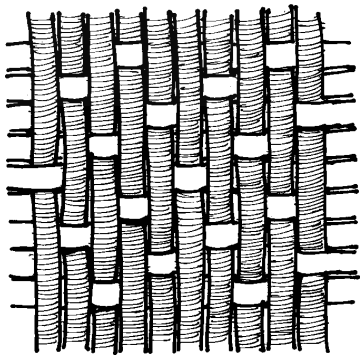
Fig 3



CT111023

In **satin weave**, one set of threads is floating over the other set of threads. The warp yarn passes over four or eight weft yarns to produce the effect. But it is also possible to create a weft satin weave. Then the weft yarns are predominant on the face of the fabric. Examples (for the more common warp satin weave) are satin, damast, chiffon (Fig 4)

Fig 4



CT111024

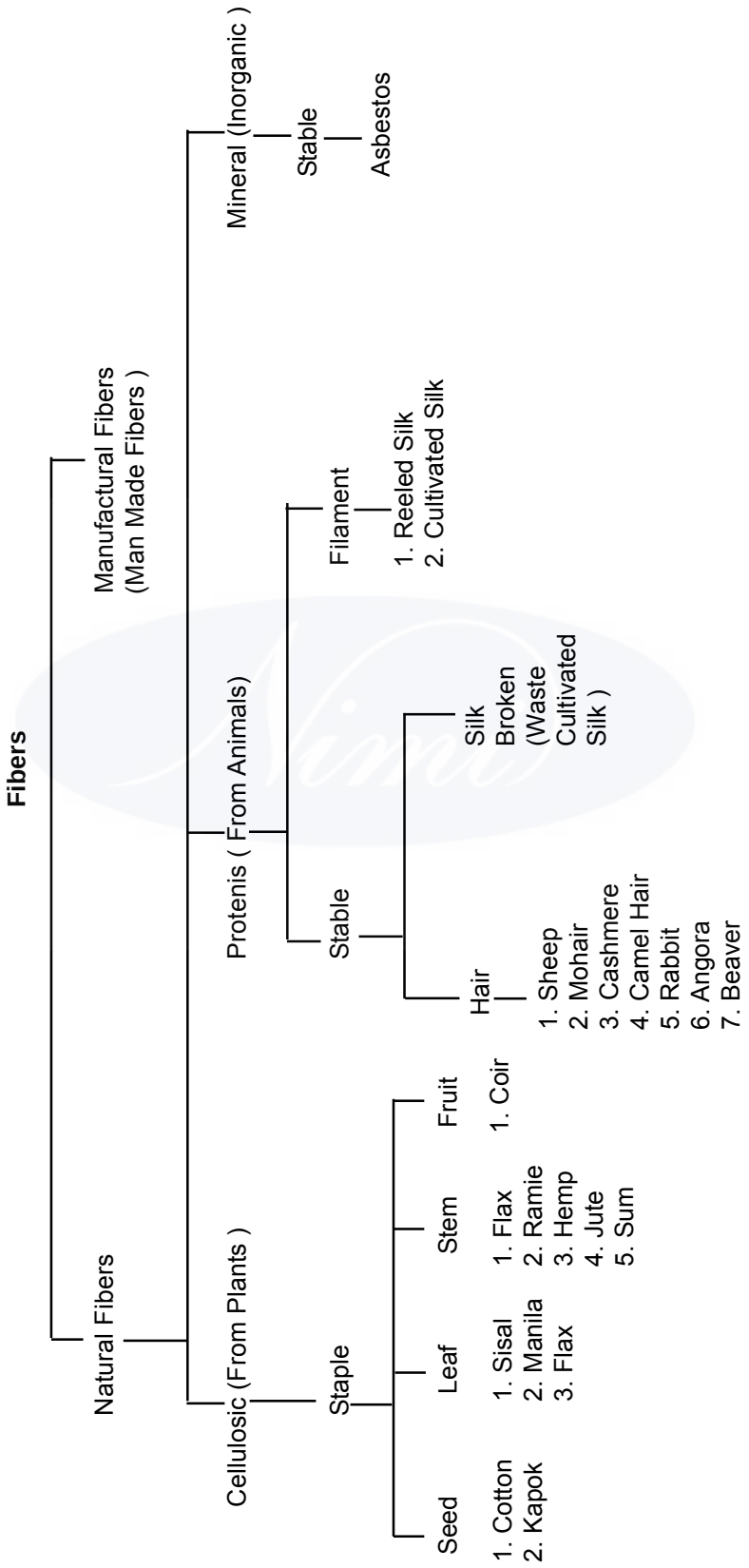
Non-woven fabrics have no grain. They are made by pressing fibres together, eg. felt, plastic film and vilene interfacing.

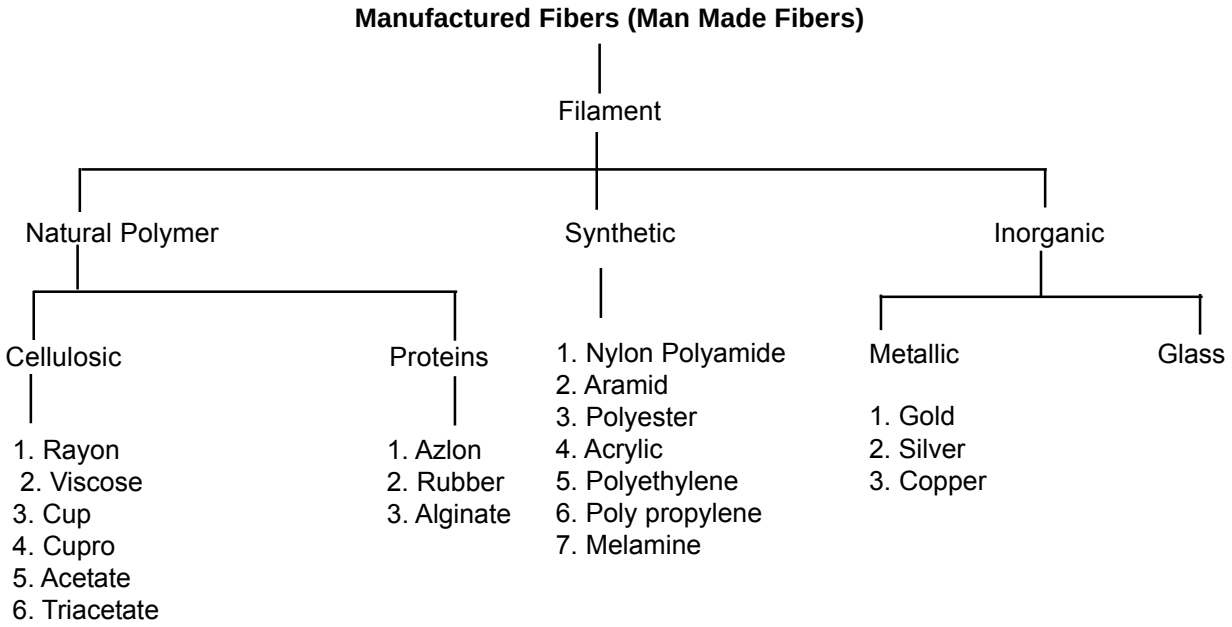
Many fabrics are given a finish after they are woven to increase their body, to prevent shrinkage (sanforized) or wrinkling (crease-resistant), to impart crispness to the surface or to make them drip-dry, water repellent, stain resistant or mothproof. There are also other finishes such as dull, shiny, stretch, rough, soft, smooth, fine, coarse, lustrous, hard and laminated. The fabrics are labelled with the respective finish.

Napped fabrics have hairlike fibres lying in one direction. This effect is achieved by a special weaving and finishing process, eg. flannel, velvet, face cloth and wool broad cloth. These fabrics are called one-way fabrics.

Fabrics give variety in feel, e.g. ranging from rough to smooth. This effect is caused by the texture of the fabric. Texture refers to the surface appearance of the fabric and its characteristic body or hang. Texture is created by yarn, weave and finish of the fabric.

Classification of Fibers





Identification of fabrics: For identification of right and wrong side of fabric the following criteria will be helpful. Place both sides of fabric beside each other.

On right side of fabric

– the design is more bright and clear

– the selvedge is darker

– the piles are visible

If you want to buy a certain fabric like cotton for example you will normally find the information about the type of the fibre written on the selvedge of the material itself.

But some of the fabrics are not labeled. In that case different types of test help to determine the fibre. Two tests which are not difficult to perform are explained below.

Burning test: With the help of tweezers some yarns or a small piece of cloth will be burnt horizontally in a flame. The way of burning down, the smell and the residue inform about the type of fibre.

Dry tearing test: A piece of fabric is slashed and formed by hand. The length of the fibre ends at the torn edges informs about the type of the fibre. This test helps to distinguish amongst cotton and linen (while the burning test gives same features for these fabrics).

	Burning	Smell/residue	Dry tear testing
Cotton	Burns quickly and bright	Like burning paper/leaves a grey ash powder	Short fibre appear at the torn edges
Linen	Burns quickly and bright	Burns like paper/grey powder ashes left	The torn edges are much longer than that of cotton
Wool	Burns slow	Like burning horn or hair/ black ash is left	
Silk	Burns slow	Smell like burning horn or hair/leaves a black crystalline ash	
Polyster	Melts and shrinks from	No smell/leaves a brownish mass the flame hard and uncrushable	
Nylon	Shrinks and melts away from flame	No smell/leaves a hard residue, with fibre uncrushable forming drops	

Characteristic features of fibres

Fibre and source	Characteristics	Typical fabrics and uses	Care
Natural fibres			
Cotton From seed pod of cotton plant	Strong even when wet absorbent. Draws heat from body. Tends to crease Good affinity for dyes. Shrinks unless treated. Weakened by sunlight.	Used for summer wear, season-spanning garments, work clothes Examples: Corduroy, denim, poplin, terry, organdy, seer-sucker care instructions	Most cottons can be laundered Colourfast ones in hot water, others in cold water. Tumble-dry at hot setting. Chlorine bleach can be used . Iron while damp.
Linen From flax plant	Strong. Absorbent. Creases unless treated. Poor affinity for dyes. Some tendency to shrink and stretch. Deteriorated by mildew.	Fabrics usually have coarse texture and natural luster Draws heat from body Weave weights vary light to heavy. Used for spring and summer wear; also many household items	Usually dry-cleaned to retain the crisp finish. Can be washed if softness is preferred. Usually shrinks when washed.
Silk from cocoons of silkworms moths.	Strong. Absorbent. Holds in body heat. Crease resistant. Good affinity for dyes, but may bleed. Resists mildew, Weakened by sunlight and perspiration	Luxurious, lustrous fabrics in many weights. Used for dresses, suits, blouses and linings Examples: Brocade, chiffon, crepe, satin, tweed, jersey	Usually dry-cleaned, if washable, usually done by hand in mild suds. Avoid chlorine bleach. Iron at low temperature setting
Wool From fleece of sheep	Relatively weak. Exceptionally absorbent. Holds in body heat Creases fall out. Good affinity for dye. Needs mothproofing. Shrinks unless treated	Fabrics of many weights, textures, constructions. Used for sweaters, dresses, suits and coats Examples: Crepe, flannel, fleece, gabardine, melton, tweed, jersey	Usually dry-cleaned. Many sweaters can be washed in tepid water and mild suds; do not wring. Do not use chlorine bleach. Some wools can be machine-washed; follow instructions
Man-made fibres (selection)			
Nylon	Strong. Low absorbency. Holds in body heat. Resists wrinkling, soil, mildew and moths. Tends to pill. Accumulates static electricity.	Wide range of fabric textures and weights. Often blended with other fibres. Used for lingerie, linings, swimsuits, blouses & dresses Examples: Fake fur, satin, jersey ture.	Can be washed by hand or machine in warm water. Use gentle machine cycle. Use fabric softener to reduce static electricity. Tumble-dry or drip-dry. Iron at low tempera-
Polyester	Strong. Low absorbency. Holds in body heat. Resists wrinkling, stretching, shrinking, moths and mildew. Retains heat-set pleats electricity Examples: Crepe, double knit.	Wide variety of fabrics in many weights and constructions. Used for dresses, Accumulates static suits, sports-wear, lingerie, linings, curtains, thread, filling for cushions setting for touch-ups.	Most polyesters are washable in warm water by hand or machine Tumble-dry or drip-dry. Use fabric softener to reduce static electricity. May need little or no ironing; Use moderate heat.

The textile labelling regulations in different countries aim at providing information on the fibre types which have been used to make a fabric. In dresses, the fibre content information is written on sewn-in labels ffixed at collar or in the side seams. In fabrics, it is wirtten on the selvedge. If the product is sold in a package (e.g. socks) the information is given on the packaging.

100% silk	Materials which are made 100% from only one raw material may be described as "pure" or "all"; an allowance of 7% for visible decoration material is given. Interlinings used for shaping need not be identified.
80% Nylon 20% of elastine	With blended products, the percentages by weight of the constituent fibres must be given. The fibres must be listed in decreasing order.
Minimum 85% silk	For textiles which are made from several fibres, one of which is at least 85% it is sufficient to say "85% minimum content".
60% silk with wool and viscose	If no one fibre in a blend is as much as 85%, then it is sufficient to give the percentage share of the dominant fibre with the other components listed in decreasing order .
85% cotton 15% other fibres	If one or more components are present in an amount of less than 10%, then they may be designated as "other fibres"
Outer fabric: 100% new wool Lining: 100% silk	With lined clothing, the fibre content of the main lining material must be given.

Types of hand stitches and their use

Objectives: At the end of this lesson you shall be able to
- **name and classify hand stitches**
- **describe their use.**

Basic stitches are divided into constructive and decorative stitches which are used in embroidery. Constructive stitches are further divided into temporary and permanent stitches.

Temporary stitches: Basting or tacking is a temporary stitch used for holding two or more layers of materials together before the permanent stitches are made. Usually this stitch is horizontal and is worked from right to left. This is the only stitch, which is started with a knot. For basting use a contrasting colour thread so that it can be easily seen and removed. The length of the stitch will vary depending on the weight of the fabric and how securely the pieces are to be held together. To end basting make two stitches, one on the top of another. There are several types of basting stitches.

Even basting is used for short length of seams and folds.

Uneven basting is used for long length of seams and folds.

Diagonal basting is used when several layers of fabric are to be held securely.

Padding stitch is used in coats to hold the lining and inner lining.

Tailor's tacks – Thread marks are basically uneven basting stitches. They are used to transfer marks on a lower layer of fabric.

Permanent stitches: In permanent stitches avoid using knots, while starting and ending the stitches. Begin with a small back stitch if it can be concealed under the permanent stitches or leave a short length of thread (about 2 to 3cm) extending on the wrong side which can be caught and held under the first few permanent stitches. To end the stitch take the thread to the wrong side and secure with loops.

Running stitch is the simplest of all the hand stitches, used for sewing hand made seams, tucks, gathering, quilting and mending.

Back stitch is strong and sometimes substituted for machine stitching.

Pick Stitch (Half back stitch) is used on fine materials.

Overcasting is used on raw edges, either single or double to prevent them from fraying.

Hemming is used to secure a folded edge of material. Its most common use is for hems. Hemming appears as small, slanting stitches on the wrong side and sometimes on right side. These stitches should be fine and spaced close enough to hold the hem securely in place. Before starting the hem, fasten the thread with several tiny stitches on top of each other. Finish the hemming with several stitches to fasten it securely. Don't use too long thread for stitching. The maximum length should not exceed 70 cm to avoid knots in thread, it also helps to avoid accident with the needle while pulling the thread.

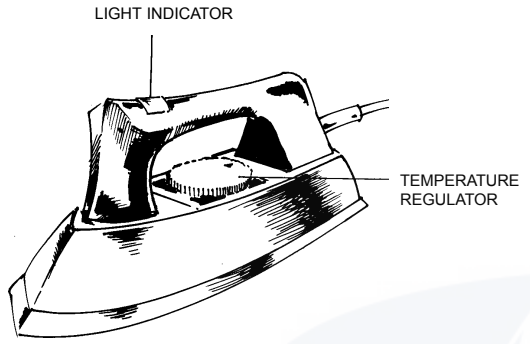
Pressing equipment

Objectives: At the end of this lesson you shall be able to
- **name the pressing equipment and its application**
- **explain the importance of pressing.**

Pressing equipment

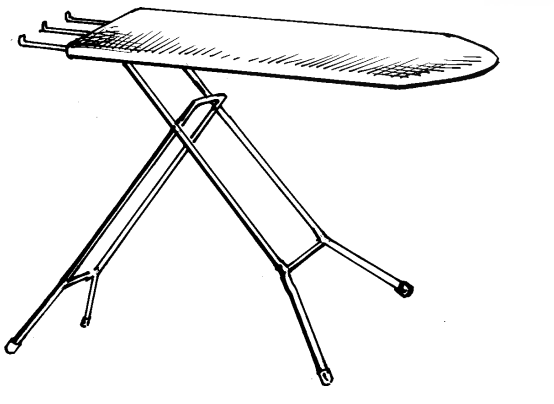
Electric iron: It is specially shaped with pointed nose and parallel sides. The bottom plate of the iron is heavy, hard and smoothly polished, so as to allow easy movement on the fabric to be pressed. It is provided with a non-conducting handle and a temperature regulator or a thermostat. (Fig 1)

Fig 1



Ironing board/pressing table (foldable)**:** It is a flat, hard board, made of either wood or metal. The board is stuffed with cotton and covered with cotton fabric and it is fixed on an adjustable stand to vary the height. (Fig 2)

Fig 2



Tailor's ham: It is a firmly packed cushion with rounded ends. It is used for pressing shaped areas such as bust darts and curved seams; it is also used for moulding the corner. (Fig 3)

Point presser: It is a sharp pointed wooden board and is used for pressing seams in collars and for helping to bring out the sharp points in collars, cuffs etc. (Fig 4)

Fig 3

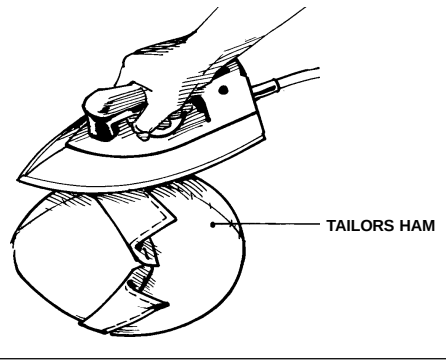
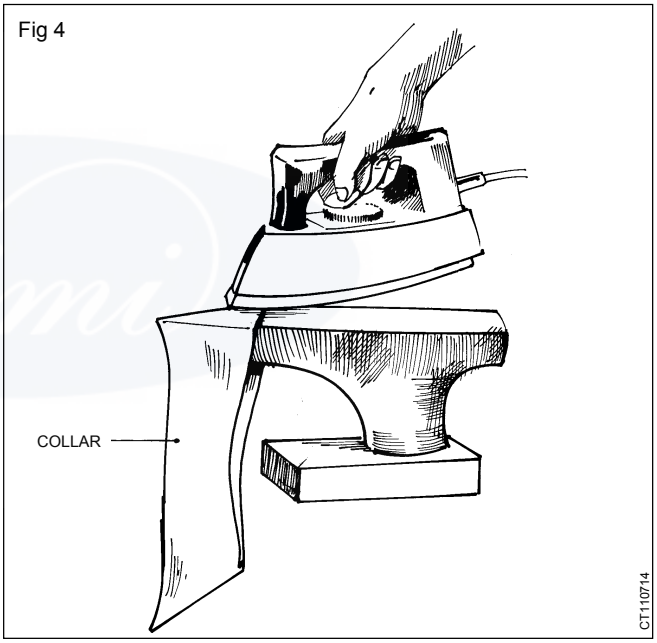
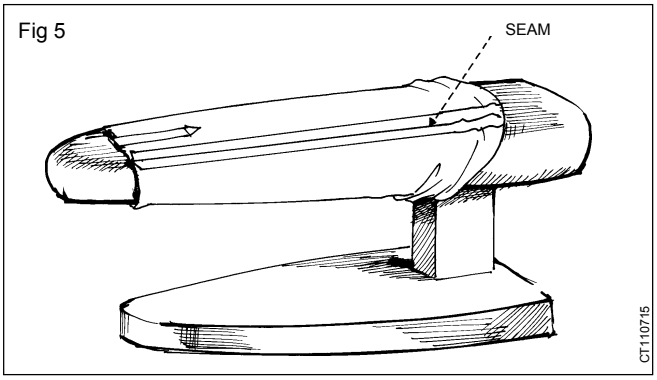


Fig 4



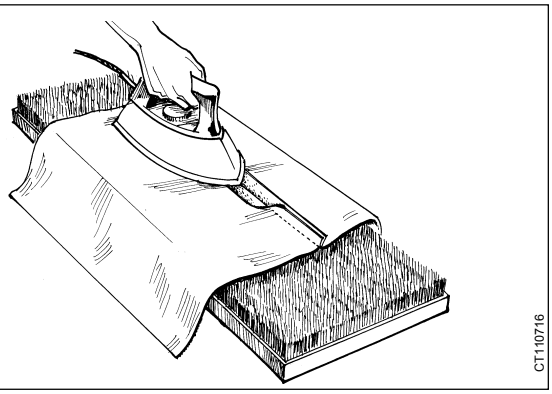
Sleeve board: It is a board with a narrow, long, flat surface on which the seams and details of the narrow sections of the garment, such as the sleeves and the legs of the trouser can be easily pressed. (Fig 5)

Fig 5



Needle board: It is a board with a collection of small needles fixed on a wooden board. It is used to press pile and nap fabric (e.g. corduroy, velvet) (Fig 6)

Fig 6



Pressing is as important process during and after stitching. Pressing will remove wrinkles, sharpen creases, flatten bulky layers and open seams. Pressing can shrink or stretch a fabric.

The main factors involved are heat, pressure and humidity. These factors have to be harmonized with the fabric which shall be pressed.

Pressing is done

- during the construction of a garment (press flat seams, darts, press components in shape etc.)
- for finishing of a garment after stitching.

Differences between **ironing & pressing**: Ironing is the process by which the iron is pushed along the fabric in lengthwise or crosswise direction. The ironing process is used for garments after they have been constructed.

Pressing is the process by which the iron is lifted up and set down on the fabric in a series of up and down motion, in the lengthwise and crosswise direction. Pressing is done for all garments during the process of constructing.

Safety precautions

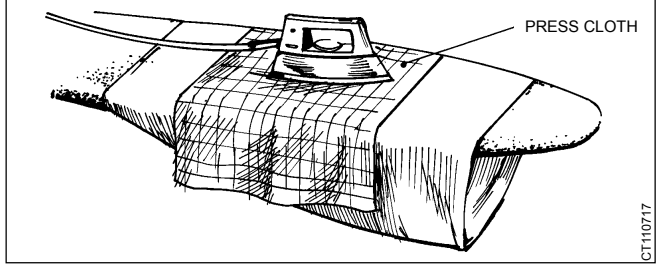
- Do not let iron cord drag over your work.
- Either use the iron stand or tilt the iron when not in use depending on the type of iron you have.
- Do not scorch the ironing board cover.
- If starch is stuck to the iron, let it cool and then scour with soap or non-scratching scouring powder or baking soda.
- Use distilled water for steam irons; empty the same when you have finished your work.
- Make sure that there is no leakage of electricity in any part of the iron, the wire and plug pins.
- Never leave the heating surface of iron on the ironing table or on the cloth when in rest, the iron must be kept in erect position.

Set the regulator or control on your iron correctly for the less heat resistant fibre in your fabric. Temperatures are not always clearly marked on the iron dial but should be graded from hot to cool in this order: linen - cotton - rayon - wool - silk - nylon (and other artificial fibres).

Wet pressing can easily be done with a steam iron. Otherwise sprinkle water directly on the fabric and leave it for a minute before ironing.

Another method of wet pressing can be done with the help of a damp cloth. It is used for linen or wool fabric. For some fabrics like spun rayons, embossed and glazed fabrics its better to press dry. (Fig 7)

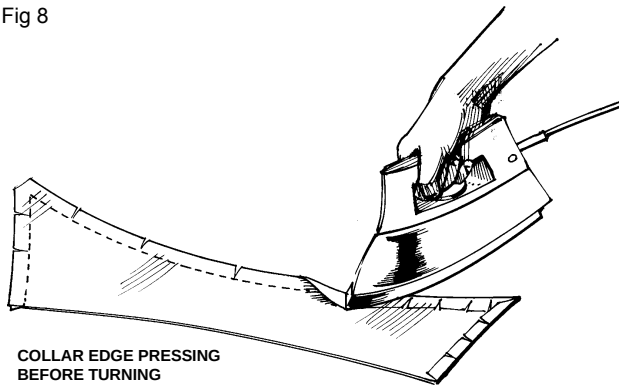
Fig 7



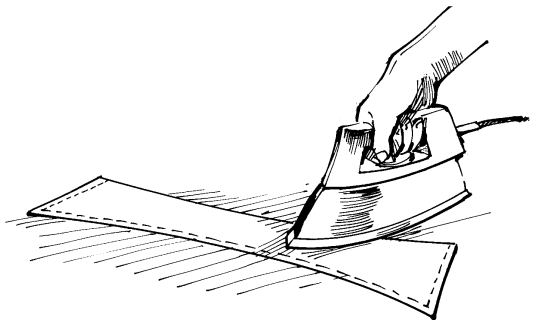
Techniques for pressing during construction

- Pressing over basting is frequently necessary along edges with enclosed seams, pleats or hems. After a first light dry pressing, clip the basting, remove and press again with dampness before the marks made are set on the fabric. Never press over pins.
- Press with the grains, also on bias components press along the grains.
- Have scissors handy at the pressboard to release any pull from points that are not sufficiently slashed. Corners or curves that are to be trimmed or slashed closely are less likely to fray if they are dampened and well pressed before cutting.
- After a piece of garment is pressed, keep it pinned up on a coat hanger or spread out carefully to dry so that you won't have to give it another pressing.
- Gathers are pressed by folding firmly at the stitching line in your left hand. For slow work reduce the heat.
- Hold the side of the iron closely parallel to the stitching line when fullness is to be shrunken out.
- Press-buttons, embroidery, lace, beading, braiding are to be pressed from the wrong side over a soft pad such as layers of turkish towel.
- Press collars, cuffs, belts and pockets first on the wrong side then finish them on the right side very lightly over a press cloth. Press first along the edges firmly, remove basting, press again. Work from the outer edges towards the inside. (Fig 8)

Fig 8



COLLAR EDGE PRESSING
BEFORE TURNING



COLLAR PRESSING
AFTER TURNING

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– Do not press lengthwise creases in sleeve if you want a professional appearance, instead use sleeve board.

Order of pressing work

– First press interior parts such as pockets, facings, seams, linings and shoulder pads.

– Then press sleeves.

– Press ruffles and gathers before the parts they trim.

– Press yokes and shoulder seams before the lower blouse.

– Press top parts of long garments before the lower parts (blouse before skirt); skirt top before lower part of skirt.

– The collar is usually pressed last, because its position next to the face is so important.

– Finally remove any creases accidentally produced. Do not put creases in sleeve or below dart or unpressed pleats.

Method of shrinking

Objectives: At the end of this lesson you shall be able to
- **explain the method of shrinking and it's use.**

Fabrics have a tendency to shrink when they are first dipped in water. Therefore, the fabric is made to shrink before stitching. Pre-shrunk material does not need shrinking treatment.

Shrinkage is not necessary in case of sanforized fabrics. Non-sanforized fabrics like cotton, silk, wool etc. have to be shrunk by different methods.

After shrinking the fabric should be pressed well to remove wrinkles.

There are several methods of shrinking. The fabric may be soaked in water for a few hours or the fabric may be steamed.

Shrinking treatment for different fabrics: White fabrics (Cotton, Linen) should be soaked in hot water for minimum of four hours. The position of the fabric should be changed once or twice to get uniformity in the shrinkage. Same treatment is applicable to coloured fabrics as well, except that these are to be soaked in luke warm water.

The shrinkage treatment for woollen fabric is given by steam, adopting any one of the two methods:

A wet turkish towel is placed in between two layers of the woollen fabric so that the right sides touch the wet towel. Spread press cloth on the top layer and press it with hot iron. The steam generated from the wet towel ensures shrinkage.

The other method is to spread a wet muslin cloth over the fabric and rolling the fabric together. Then the wet muslin is removed and the fabric is pressed with hot iron.

Precautions

– The container used for soaking and the wire ment for drying should be free from rust and dust

– Two different coloured fabrics should not be soaked together

– Drying should be done under the shade.

Sari fall

Objectives: At the end of this lesson you shall be able to
- **explain the varieties of sari fall fabrics and their application.**

The sari fall is a long piece of fabric with a narrow width, extending to half the length of the sari. It prevents the early wear and tear of the lower edge of the sari. It also gives a good fall and drape of the sari, especially for thin and light woven sari fabrics.

It is attached to the falling end of the sari or the bottom. The fabrics generally used are of three varieties: cotton, terrcossa and polyester. Cotton falls are used for cotton saris and polyester and terrcossa are used for polyester, silk and chiffon saris.

Select the sari fall, which nearly matches the sari, in colour and fabric. (ie. cotton with cotton and polyester with synthetic).

Since saris are not shrinked before a fall is attached, polyester falls should not be stitched on cotton saris and vice versa. It affects the appearance of the sari by puckering due to uneven shrinkage.

Use pre-shrunk saris and sari falls for attachment. Otherwise shrinkage treatment and pressing have to be given.

If the selection of the sari fall is of poor quality, it may get torn earlier than the sari. The colour of the fall may get faded causing damage to the sari.

Precautions

– Apply good quality falls

– Always shrink and press the cotton falls before stitching

– Fall should match with the sari as much as possible in colour and fabric

– While stitching the sari fall, don't stretch the sari or falls.