IVC Course Code : 410

FASHION & GARMENT MAKING (F.G.M)

First Year

(w.e.f. 2018-19)

Intermediate Vocational Course

Paper I : Fundamentals of Garment Construction

Paper II : Fundamentals of Textiles

Paper III : Fashion & Apparel Designing

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ANNUAL SCHEME OF INSTRUCTIONS AND EXAMINATIONS FOR I YEAR

FASHION GARMENT MAKINGCOURSE

1st YEAR

Part-A		Theory		Practicals			Total	
		Periods	Marks		Periods	Marks	Periods	Marks
1	General Foundation Course	150	50				150	50
2	English	150	50				150	50
Part-B								
3	**Paper-1** Fundamentals of Garment Construction	135	50	Paper-1 Fundamentals of Garment Construction	135	50	270	100
4	**Paper-II** Fundamentals of Textiles	135	50	Paper-II Fundamentals of Textiles	135	50	270	100
5	**Paper-III** Fashion & Apparel Designing	135	50	Paper-III Fashion & Apparel Designing	135	50	270	100
6	OJT				363	100	363	100
	Total						1473	500

EVALUATION OF ON THE JOB TRAINING:

The "On the Job Training" shall carry 100 marks for each year and pass marks is 50. During on the job training the candidate shall put in a minimum of 90 % of attendance.

The evaluation shall be done in the last week of January.

Marks allotted for evaluation:

S.No	Name of the activity	Max. Marks allotted for each activity
1	Attendance and punctuality	30
2	Familiarity with technical terms	05
3	Familiarity with tools and material	05
4	Manual skills	05
5	Application of knowledge	10
6	Problem solving skills	10
7	Comprehension and observation	10
8	Human relations	05
9	Ability to communicate	10
10	Maintenance of dairy	10
	Total	100

NOTE: The On the Job Training mentioned is tentative. The spirit of On the Job training is to be maintained. The colleges are at liberty to conduct on the job training according to their local feasibility of institutions & industries. They may conduct the entire on the job training periods of I year and (450) II year either by conducting classes in morning session and send the students for OJT in afternoon session or two days in week or weekly or monthly or by any mode which is feasible for both the college and the institution. However, the total assigned periods for on the job training should be completed. The institutions are at liberty to conduct On the Job training during summer also, however there will not be any financial commitment to the department.

FASHION & GARMENT MAKING

Paper - I

FUNDAMENTALS OF GARMENT CONSTRUCTION

INDEX

UNIT-1

Sewing Equipment and Tools

Structure

1.0 Introduction
1.1 Sewing Tools
1.2 Measuring Tools
1.3 Marking Tools
1.4 Cutting Tools
1.5 Pressing Tools
1.6 General Tools

Learning Objectives:To know

- The uses of each sewing tool.
- Distinguish between various sewing tools.
- Identify the best tools used in construction of various parts of the garments.

Unit preview:

Sewing equipment and tools will visualize the use of different tools used in clothing construction.A good knowledge of sewing tools help in using the appropriate tools for overall quality of the product prepared besides, making the task of sewing easy for the beginner.

1.0 Introduction

Sewing tools are needed for sewing which aid in construction of garments of good quality and appearance. The equipment are classified into measuring, marking, cutting general tools and pressing tools.

1.1 Sewing Tools

1.1.1 Hand Sewing Needles:

They are found in sizes from the very fine 9 to the heavy 18. The best quality needles are made of hand ground steel. For hand sewing medium length needles with a short oval eye is selected. Crewel needles designed for embroidery work have a long oval eye.

Fig – 1.1 Hand sewing needles

1.1.2 Sewing Machine Needles:

They are found in sizes from the fine 9 to the heavy 18. The needles are made to fit the specific make and model of each sewing machine. The needle sizes should conform to the weight, thickness and kind of fabric.

1.1.3 Sewing Threads:

With ever-increasing range of fabrics available in the markets, it is important to know the right sewing thread for the various types of fabrics. The right kind of thread is important in sewing as both the thread and the garment should share the same characteristics, as they have to be laundered and ironed together, they should shrink and stretch together.

1.1.4 Pins:

These come in different sizes for use in different fabrics. The right choice of pins is most essential for good workmanship, speed and convenience in sewing. Use silk or stainless-steel pins. The ball point pins are useful for fine knits. The other types of pins are dressmaker pins (a pin of medium diameter but quite suitable for most sewing needs), and silk (a very slender pin with a needle point to be used on delicate fabrics).

1.1.5 Thimbles:

These are necessary for efficient and accurate hand sewing. A metal thimble should fit snugly on the middle, holding hand. There are two types of thimbles: an open-ended thimble, preferred by tailors and the more common closed-ended thimble called the dressmaker thimble.

Fig 1.2

1.1.6 Embroidery Frame:

This is used for keeping the fabric stretched while the work is being carried out.

1.1.7 Embroidery Threads:

These are available in a variety of colors in six stranded skeins. One can use two or three strands at a time.

1.1.8 Stiletto:

This is sharp pointed instrument for punching holes in materials. It is used for forming holes in material. It is used for forming eyelets in belts and for embroidery works.

Fig 1.3

1.1.9 Bodkins:

This is a flat needle with a blunt end and a large eye for threading elastic.

Fig1.4

1.2 Measuring tools

1.2.1 Measuring Tape:

It has a smooth surface that is clearly marked with inches and centimeters on both sides. It is usually about ½ inch to ¼ inch wide and 60 inches long and has 1/8 divisions. At one end of the tape is attached a brass strip about 3 inches long and at the other end a small brass covering.

Fig 1.5

1.2.2 Rulers:

They are used in sample room which are either clear plastic or metal. It is useful to have 2 rulers: one is 1 inch wide and 6 inches long, and the second is 2 inches wide and 18 inches long.

Fig 1.6

1.2.3 Yard stick or metal scale:

It is available in 36 inches or 45 inches in length in wood or metal. They are useful for checking grain lines when fixing pattern pieces on material and for drawing long seam lines on fabric or paper.

Fig 1.7

1.2.4 L- Square

It is a L - shaped metal ruler; the long arm measures 24 inches, the short arm 14 inches. This has a perfect right angle corner and is used to draw lines at right angles at the time of drafting. It is helpful during the process of "straightening fabric" to check whether the corners of the fabric have got the right-angled structure.

Fig 1.8

1.2.5 Skirt Marker:

They mark hem length accurately. Markers are adjustable and are available for the use with chalk powder or pins. A six-inch gauge can be made of cardboard or bought from a shop. It is useful as a measuring guide for marking width of hems, pleats, seam allowances etc., accurately. Notches are provided at regular intervals along the gauge, one edge of the notch is at right angles to the straight while measuring or marking. Use the straight edge of the notch as a guide.

Fig 1.9

1.3 Marking Tools:

1.3.1 Tracing Wheel:

It is used to transfer the pattern markings including seams, darts and pocket placements to the wrong side of the fabric with the aid of tracing paper. The small serrated edge tracing wheel, is appropriate for the most fabrics. A smooth edge tracing wheel is used on fine or knit fabric to avoid snagging the yarns.

Fig 1.10

1.3.2 Tracing Paper:

It is a wax - coated paper used with the tracing wheel to transfer pattern markings to the wrong side of the fabric.

1.3.3 Tailors chalk:

It is made of wax or stone chalk that is used to transfer markings to the fabrics when white carbon is not visible. Stone chalk is also available in pencil form. This is available in assorted colors and in rectangular or triangular shapes.

1.4 Cutting Tools

The following types of shears and scissors are made for both right handed and left handed cutting. All cutting tools must be kept sharp, clean and grease-free for accurate cuts.

1.4.1 Bent-handle shears:

They are 8 to 10 inches Fig 1.11. They are used for cutting all types of fabrics. Shears differ from scissors in that they have one small ring handle for the thumb and a large ring handle for the second, third and fourth fingers.

Fig 1.11

1.4.2 Scissors

They are 5 to 6 inches long. They are used for light cutting, trimming, clipping corners and cutting curves. These have round handles for both the blades. They

are designed for snipping threads and trimming seams. They should be held so that the wider blade is above the narrower blade.

Fig 1.12

1.4.3 Pinking shears:

They are 9 to 10 inches long fig 1.13. They produce a notched cutting line (zig-zag) which gives a neat appearance to the inner side of garments.

Fig 1.13

1.4.4 Button hole scissors:

These can be adjusted so as to cut button holes in any size required (fig 1.14). They are useful if one needs to make many button holes.

Fig 1.14

1.4.5 Electric scissors:

These are used in most sample rooms. They are ideal for cutting silk, nylon and soft and hard to cut fabric (fig – 1.15).

Fig 1.15

1.5 Pressing tools

The pressing equipment are used to give the perfect shape to the fabrics and iron different garments parts in construction, also helpful to give the neat appearances to the finished garments.

1.5.1 Iron:

An automatic iron is useful for pressing fabric before cutting, during construction and after the garment is completed.

Fig 1.16

1.5.2 Steam Iron:

It has an adjustable temperature control and is equipped with a thumb press for automatic steam. Distilled water is heated and the resulting steam can be released with thumb press while pressing.

Fig 1.17

1.5.3 Ironing board:

It is used for hand pressing which is padded and of convenient height. One may use an ordinary table covered with sheet and blanket for this purpose.

Fig 1.18

1.5.4 Sleeve Board:

This is a well-padded miniature of a full-sized board and is used to press sleeves and other small details of the garments. It has a tapered end one side and a round end on the other side.

Fig 1.19

1.5.5 Press cloth:

Fabric used for press cloth should be color fast and should be washed or boiled to remove all sizing.

1.6 General Tools

1.6.1 Awl:

It is a small, sharp pointed tool used to punch small round holes for markings on paper or leathers.

Fig- 1.20

1.6.2 Seam rippers:

It is used to remove basting stitches and to rip out unnecessary stitches.

Fig-1.21

1.6.3 Loop Turner:

It is long with a latch hook, used for turning bias strips to make spaghetti straps and narrow belts.

1.6.4 Dress form:

This is a padded form of body and may be made of wood, cardboard, plaster of Paris, reinforced plastic. This is a necessity in all sample rooms for designing and fittings.

Fig -1.22

1.6.5 Paper:

It is for pattern making purposes and fabric cutting. This soft paper comes in rolls of plain paper or paper with blue dots or other markings at set intervals.

1.6.6 Mirror:

It is used for model fittings.

Fig 1.23

1.6.7 Orange Sticks:

This is a long tool with a point that can be inserted into the corners of collars, seams etc so as to give a neat pointed appearance.

Fig -1.24

1.6.8 Cutting Board or Table:

A table of 5 feet by 3 feet and height of 2 feet 6 inches is of convenient height and size for cutting and construction of garments.

1.6.9 Pin Cushion:

A small stuffed cushion made of wool or felt, fitted with wool or hair to hold the pins while working near the table is more useful. Pin cushions made with an elastic strap that can fastened to the wrist makes work faster.

Summary

A variety of tools and equipment are used for performing various functions such as sewing, cutting, measuring, pressing etc. A knowledge about these tools will help us to choose the right tool to complete a particular task in the process of garment construction.

Short Questions:

1.What is a thimble?
2.Write about stiletto.
3.What is a measuring tape?
4. What is tracing wheel?
5.List out the types of cutting tools.
6.What is a sleeve board?
7.What is the function of seam ripper?

Long Question

1. Write in detail about Measuring tools.
2. Discuss about General tools.
3.Answer any three of the following.
(a) Marking tools
(b) Pressing tools
(c) Dress-form
(d) Stiletto

UNIT- 2

Sewing machine

Structure

2.0 Introduction

2.1 Types of Sewing Machines

2.2 Parts of Sewing Machine

2.3 Threading the machine

2.4 Machine Adjustments

2.5 Common problems and repair

2.6 Care of machine

Learning Objectives:

- To get acquainted with the parts and working of sewing machine.
- Use of correct size of needle and correct thread to maintain the smooth running of the machine

Unit Review:

Sewing is a creative and interesting skill. This chapter gives the knowledge of sewing machine and its functions and how to overcome some of the difficulties in using the machine.

2.0 Introduction:

In the art of dress-making, sewing machine plays a major role and has acquired foremost place in stitching. Sewing machine is the essential tool in stitching. Sewing machines of various models such as domestic model, tailor model, industrial model, portable and cabinet models are available in market. These may be operated by hand, treadle or electric motor. Automatic sewing machines that make the zig-zag stitch in addition to the usual straight stitch are also being manufactured and sold now. The type and the amount of sewing you do, the space you have for a machine (and of course your budget) should be considered while selecting a machine.

2.1 Types of sewing machines

Sewing machines of various models such as domestic model, tailor model, industrial model, portable and cabinet models are available in market. These may be operated by hand, treadle or electric motor.

2.1.1 Hand operated sewing machine:

This is the simplest form of sewing machine which is operated by hand. Detachable handle provided to the fly wheel, is used to operate the machine. This machine is generally suitable for domestic purpose and is portable and space saving.

2.1.2 Treadle sewing machine:

This machine is exactly like the hand sewing machine but it is operated by feet using an additional stand. In this type the balance wheel is operated by belt with the help of lower stand which is operated by feet. This machine operates faster than hand machine. This machine is suitable where there is no power supply. When handling this machine both the hands are free to handle the fabric, speeding up the work. Even some of the heavy-duty machines are operated by this method.

2.1.3 Electric sewing machine:

This is the fastest sewing machine and one needs, practice to handle it. In an electric machine the balance wheel comes to the motion by a belt, which is attached to an electric motor.

2.2 Parts of sewing machine

a. Head:
The whole of the machine without box or stand

b. Bed:
The flat portion of the machine on which lower thread mechanism is mounted.

c. Arm:
It is the curved part of the head containing the mechanism for driving the needle and handling the upper thread.

d. Balance wheel:

It is the wheel at the right side of the head and is driven by a belt or handle.

e. Tension regulator:

This is fitted with the face plate for controlling the tension of the stitches. The thread is passed through the two discs; one is concave and the other is convex. There is a spring for adjustments of tension.

f. Thread take-up bar:

It is lever which moves up and down from the front axis. It is situated above the tension regulator on the outer end of the lever. There is a small hole through which the thread passes. It tightens up the loop and feeds the thread to the needle.

g. Needle bar:

The needle is attached at the lower end of the bar. It also moves up and down.

h. Presser bar lifter:

It can move up and down with the help of a lever. It should always be lifted while taking out the materials.

i. Presser foot:

It holds the material in place while working. It is removed when other attachments like the ones for hemming, binding or tacking are used.

j. Throat plate:

It is a semi-circular disc which has a hole to allow the needle to pass through it. This covers the various parts of lower threading unit.

k. Feed dog:

It has teeth like projections which carry the material backwards, as it gets stitched.

l. Bobbin winder:

It is situated near the balance wheel. It helps to wind the thread on the bobbin.

m. Stop motion screw:

It is situated in the center of the balance wheel. The machine would not work when it is released.

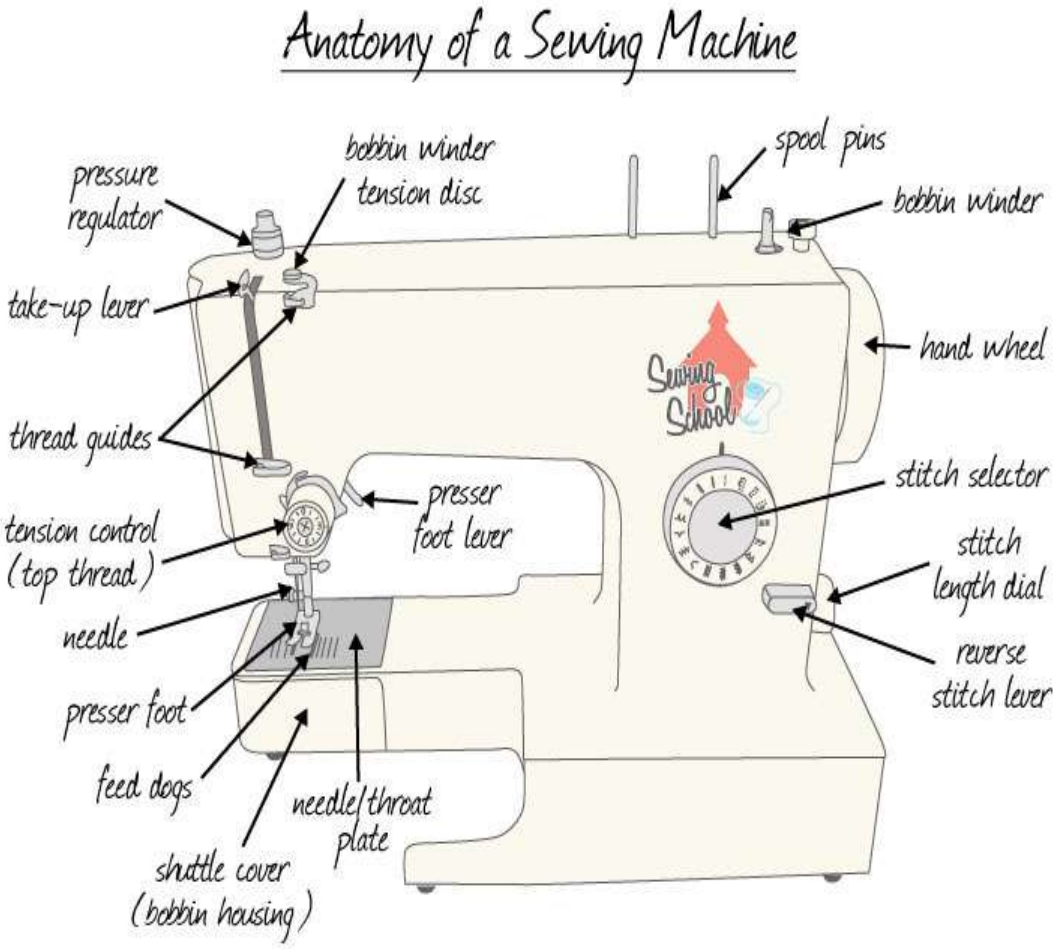


Fig – 2.1

n. Bobbin case:

It holds the bobbin.

o. Spool pin:

For holding the thread reel. It is fitted on the arm as well as on the bed of the machine.

p. Stitch regulator:

This helps to control the length of stitches. This can be operated with the help of a lever and screw for adjusting the length of stitches, lever can be pushed up for reverse stitching.

q. Bobbin winding tension angle:

It is a mechanism to wind the bobbin evenly. It is situated near the bobbin winder.

r. The Treadle:

The foot rest at the base of machine in a treadle machine.

s. Handle driver:

It is attached to the handle attachment of hand driven machine.

t. Special attachments:

These attachments are available with sophisticated models and are used for processes like hemming. pleating, sewing lace, zigzag gathering.

2.3 Threading the machine

2.3.1 Threading

Raise the presser foot with the help of presser foot lifter. Move the balance wheel until thread- take up lever is at the highest point. Place thread reel on the spool pin and pass through thread guide, upper tension regulator and thread take up lever put the thread through the needle, thread guide and eye leave 3" – 4" thread extra.

2.3.2 Winding the bobbin:

Loosen the stop motion screw on the balance wheel, place empty bobbin on the winder spindle and thread reel on the spool pin. The thread passes through the tension discs to the bobbins. The thread should be wound evenly and smoothly. It should never be wound fully. The correctly wound bobbin helps in smooth running of the thread from bobbin case, steady speed helps for even winding. It is positioned in the bobbin case and few inches of the thread is extended.

2.3.3 Tension:

Do not alter the tension once it is set correctly, except when gathering or applying decorative top stitching, uneven stitches of "looping" and puckering are caused by the incorrect tension. If the loops are underneath the fabric, the top tension is wrong. If the loops are on the top, the bottom tension is wrong. Try to make all adjustments both up and down, with the upper tension-adjusting screw which is above the needle on most machines. Adjust the lower tension only as a last resort. Most tension problems are caused by:

1. incorrect thread for the fabric
2. wrongly inserted or damaged (bent or blunt) needle
3. tension mark wrongly set
4. bobbin tension wrong

If adjustment is unavoidable, consult the machine handbook since different machines have different method of a adjusting thread tension.

2.4 Machine stitching

Place fabric under the raised presser foot, lining up the needle on the seam line. Take long ends of bobbin and needle threads to the back of the needle plate. Lower the presser foot and turn the wheel by hand to insert needle in the fabric. This takes the load off the motor for the first stitch and reduces the risk of breaking the thread.

Stitch for 15mm (1/2 inch) then reverse stitch to lock ends. Go forward again to follow the seam line. Guide the fabric evenly. Without pulling or pushing hold it lightly at the side and towards the back with the fingers of the other hand. Do not watch the needle but look at the presser foot for the guide to stitching along the marked line. Leave at least 5cm(2inch) of thread on the machine before cutting off. So that the thread is available for the next line of stitching.

Beginners should practice several rows of stitching including turning right angled corners. Do not do this in one continuous movement but stop machine at corner leaving needle in fabric. Raise presser foot, turn the fabric to the new sewing line. Lower presser foot and start stitching. Practice with different types of fabrics and different stitch lengths and tensions. Draw curves, squares and circles on fabric and practice sewing along the outlines.

Practice turning sharp corners. This is done in two moves instead of the one needed at a right-angled corner. Stop at the corner as before, but only half turn the fabric, on the thin material put one stitch across the corner (two or three stitches on thicker material), then turn again to the new seam line turn through, to the right side, pushing the corner out carefully with the point of a knitting needle.

Points and curves are always stitched before the actual shape is cut out. If cut outs are stitched first, the shape can distort during machining. Scallops are also stitched across the points between scallops. Move the fabric gently while stitching so that the curved line is followed exactly. Notch the outward curve by cutting a tiny V- shaped, a fraction from the stitching line to leave less bulk in the seam and let the curve lie smoothly. Similarly, if the curve is to lie inwards when finished the allowance is snipped not notched, so that it can spread out without puckering the seam (remember that notches close up and snips open out).

Selection of thread and needles for fabric

Fabric	Fiber	Thread	Needle	Stitching length
Finely woven	Synthetic cotton blend	Synthetic 60 Mercerised 50	9-11	10-15
Light weight woven	Synthetic cotton blend	Synthetic 60 Mercerised 50	11-14	12-15
Medium weight woven	Synthetic cotton blend	Synthetic 60 Mercerised 50	11-14	12-15
Heavy weight woven	Synthetic cotton blend	Synthetic 60 Mercerised 50	16-18 14	10-12

2.5 Table: Defects, causes and adjustments of a sewing machine

Defects	Causes	Adjustments
1. Upper thread tension	• Wrong threading of the upper thread	• The thread is passed through all the different parts of the upper thread mechanism
	• More tension on the discs of the tension regulator	• The tension is loosened by moving the screw in outward direction of tension regulator
	• Incorrect setting of the needle	• Properly set the flat end of the needle
2. Lower thread tension	• Bobbin is wound fully or unevenly	• Turning small screw of the bobbin case to loosen it .
3. Breaking of the needle	• Flat side of the needle does not set properly in the needle bar	• Set the needle properly
	• Thumb screw of the needle bar is not tightened up properly	• Tighten the thumb screw of needle bar with a screw driver
	• When needle is too long	• Too long needle should be exchanged with correct needle
	• Incorrect setting of presser foot and throat plate	• Set the presser foot and throat plate properly
	• Needle is not inserted fully in needle bar	• Insert the needle correctly
	• Heavy material is stitched with a fine needle	• Replace needle with the one with lower number
	• Too long needle strikes against the	• Exchange the needle with another of short length

	bobbin case and break • Needle strikes against fastener, pins	• Slightly raise the needle bar
4. Upper thread breaking	• Upper tension of thread is tight • Thread being too thin or of bad quality • Needle is not set properly • The thread reel is not moving properly on spool pin • Hand wheel moved in the opposite direction	• Loosens the upper tension spring slightly • Use good quality thread only • Set the needle correctly • Open the reel tube with a pencil or thick wire • Avoid this habit
5. Stitch missing	• Needle is blunt or incorrectly set • Presser foot is loosely attached • Shuttle is damaged	• The needle and pressure foot should be set properly in the needle bar • Tighten it with a screw driver • Replace with a new one
6. Looping	• Loose tension of upper or lower or both the threads • Incorrect upper and lower threading • Bobbin is unevenly wound • Thread take -up-lever is not functioning • Improper setting of the needle	• Tighten the upper and lower thread mechanism • Check both the threading and correct the same • Rewind the bobbin evenly • Clean the bobbin case and feed dog • Correct the same

	• Bobbin case and feed dog are not clean	• Occasionally clean the two with a brush soaked in petrol
7. Material Puckering	• Needle is blunt or bent • Tension of thread is too tight • Incorrect upper and lower threading • Too much or little pressure on presser foot • The upper tension discs and bobbin case are dirty • • Right size of needle is not used	• Correctly set a new needle • Correct the tension • Correct upper and lower threading • Correct the same • Clean the bobbin case and upper tension discs • Right size of the needle should be used
8. Irregular stitching	• Upper and lower thread tension is too tight or loose • Needle being blunt or bent • Thin thread is used for heavy materials	• Loosen or tighten the thread mechanism accordingly • Replace with a new needle • Use proper and thick thread
9. Machine working heavily	• Feed dog and shuttle are clogged with fibers, lint, dust etc. • Insufficient oiling of different parts • Thread caught in the shuttle • Belt of the treadle machine is being too	• Clean the shuttle, feed dog and other parts with brush soaked in petrol • Oil the different parts sewing machine regularly • Open the shuttle, remove the thread

	tight • Bobbin winder interferes with the working of balance wheel • When machine is not used for too long	• Loosen the belt • Correctly set the rubber of the bobbin winder • Clean the machine and oil all the specific parts

2.6 Care of Machine

2.6.1 Cleaning:

A sewing machine needs care for smooth running. It should be cleaned and oiled regularly to ensure satisfactory service and long life. When not in use, machine should be covered to prevent dust accumulation. Use a small dry brush or old tooth brush and soft cloth to remove dust and lint. Lint deposits should always be removed. Dust and thread bits must also be removed before oiling any part of the machines. Use a pointed instrument like a needle to pick out the thread and lint, that cannot be brushed out.

2.6.2 Oiling:

It is necessary to oil and lubricate the machine periodically. If the machine is used every day, oil it once in a week. After oiling wipe off the surplus oil and place a piece of folded fabric under the presser foot to absorb any excess oil. To oil thoroughly, remove the upper thread, needle plate, side plate, face plate, bobbin case, needle and presser foot. Oil the holes on the underside first after cleaning and then proceed to the upper side. Use only few drops of oil in each hole. Never use coconut oil. Machine oil of different brands may be used for different models of sewing machines. But should be used as recommended in the instruction book.

If the machine becomes gummed with oil, put a drop of kerosene in each oil hole and joints and run it rapidly for several minutes. Wipe off and reoil it with machine oil. The motor of electric sewing machine should be greased periodically.

Summary

The knowledge of the various parts of a sewing machine and their functions helps one to understand the working of a sewing machine. Common machine problems help us to understand and rectify the problem. Care and oiling of sewing machine is important for a long service of the machine

Short question

1. What is a feed dog?
2. List out the types of sewing machines.
3. What are the common sizes of needles used for sewing?
4. What is the use of stitch regulator?
5. What is tension disc?

Long question

1. Explain the types of sewing machines.
2. What are the parts of sewing machine? Explain
3. How do you clean and oil the sewing machine? Explain

UNIT- 3

Hand Sewing Techniques

Structure

3.0 Introduction
3.1 Temporary stitches
3.2 Permanent stitches

Learning Objectives:

- To get acquainted with the different types of hand stitches.
- To know about the difference between temporary and permanent stitches.
- The type of permanent hand stitches suitable for stitching different garments.

Unit Preview:

This unit aims at understanding the basic idea of garment construction i.e. attaching two pieces of fabrics or giving shape to a piece of the fabrics by means of stitches.

3.0 Introduction:

While going to learn about the art of tailoring or dress- making, it is necessary to have knowledge about basic stitches. The fundamentals in garment making help to gain good understanding of the art of stitching. It gives an insight to learn garment construction accurately. There are number of stitches which are used during the stitching which are done by hand. These are the stitches which may be used for temporary purpose or for permanent purpose. Basic stitches are divided into constructive and decorative stitches. Constructive stitches are further divided into temporary and permanent stitches.

3.1 Temporary stitches:

Temporary stitches are mainly used for holding the fabric without fraying or sagging during stitching. They are used to hold the garment pieces together before permanent stitches are made. These are termed as tacking or basting stitch. They are often used to hold two or more layers of material together before the permanent stitches are made. Usually this stitch is horizontal and is worked from right to left with a knot. For tacking it is better to use a contrast colour thread. There are several types of basting stitches.

3.1.1 Even basting:

This is used for tacking seams and other details, which must be held securely. The stitches are of equal length about ¼ inch on the both sides of the material. In fig 3.1

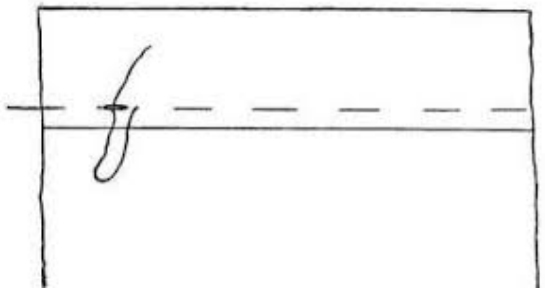


Fig 3.1 Even basting

3.1.2 Uneven basting:

The stitches on the upper side of the fabric is at least twice than that on the underside. The size of the stitches is usually ½ inch. Use this type of basting as guide line where there is a little or no strain. In fig 3.2

Fig 3.2 Uneven basting

3.2 Permanent stitches:

These are the stitches which become the part of the garments after construction. Two or three stitches at the beginning of a row, especially on the flat seams will be helpful in sewing the stitches. The different types of permanent stitches are as follows.

3.2.1 Running stitches:

This is simplest form of hand stitch which is used for permanent sewing, hand seams such as tucks, gathering, shirring, quilting and mending. It is similar to even basting, but the stitches are much smaller. The stitches should be straight, fine and evenly spaced and about 1/16 to 1/8 inch in length. Pass the needle through several times before pulling through.

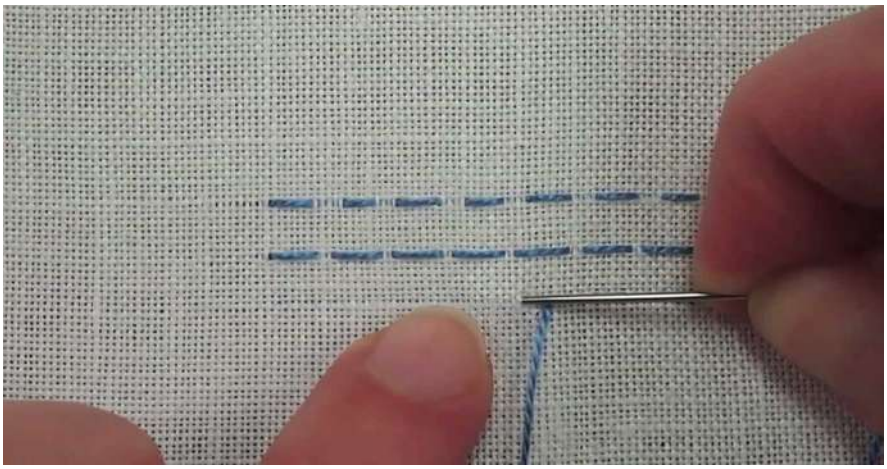


Fig 3.3

3.2.2 Back stitch:

The back stitch is strong and is sometimes substituted for machine stitching. Stitches should be about 1/16 to 1/8-inch-long on the top side. To make the back stitch, push needle up through the material at a point, on the stitching line about 1/8 inch from its right end. Take a stitch inserting the needle 1/8 inch back of the thread at the beginning of the stitching line and bringing it out an equal distance in front of the thread. Repeat this way, keeping stitches uniform in size and fairly firm. Fig 3.4

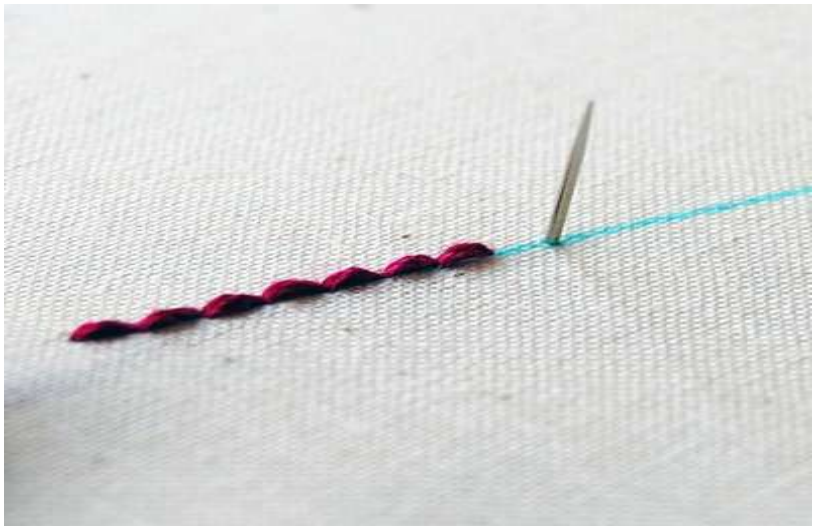


Fig 3.4 Back stitching

3.2.3 Run and back stitching

In this a back stitch and three or four running stitches are combined and can be used for working plain seams done by hand. This stitch is faster than the back stitch and stronger than the running stitch.

Fig 3.5

3.2.4 Hemming:

This is used to secure down a folded edge of material. It is most common in use, for hems. Hemming appears as small slanting stitches on the wrong side and the right side. The stitches should be fine and spaced close enough to hold the hem securely in place, yet far enough apart to be inconspicuous from the right side of the garment. Before starting the hem, fasten the thread with several tiny stitches on the top of each other. Finish off the hemming also with several stitches to fasten it securely. There are two types of hems – slip hemming and knot hemming.

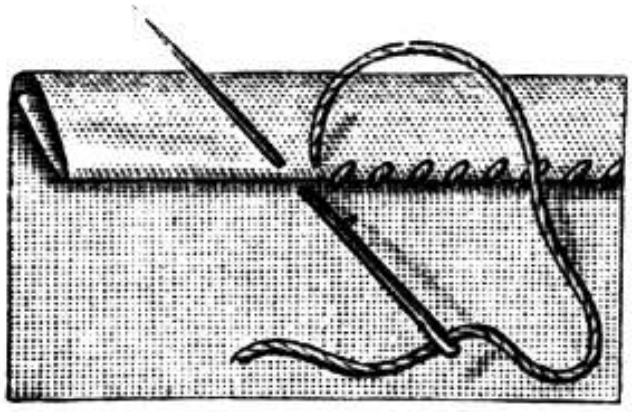


Fig 3.6

3.2.5 Slip hemming:

This is used for hems facing or folds where invisibility is more important than strength. Fasten the thread beneath the hem, bringing the needle out through the edge of the fold. Take a tiny stitch in the garment directly beneath the point where the thread leaves the fold. Now insert the needle in the hem slip it along inside the fold and bring it out again about ½ inch away. Repeat the stitch. Fig 3.7

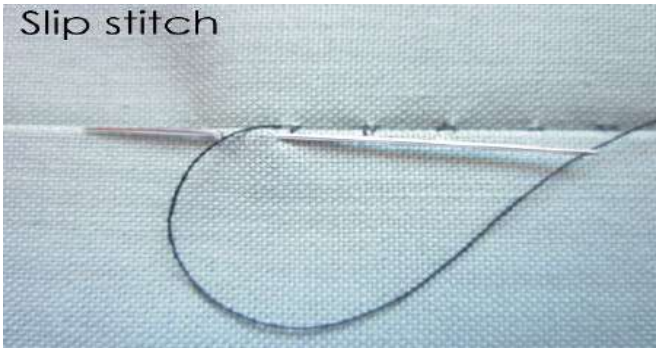


Fig 3.7

3.2.6 Knotted hemming:

This is worked from right to left. A small vertical hem stitch is made such that the thread passes around the tip of the needle that, on pulling the needle out forms a knot around the stitch made. Thus, each stitch is fixed securely by means of a knot and therefore is very strong. Fig 3.8

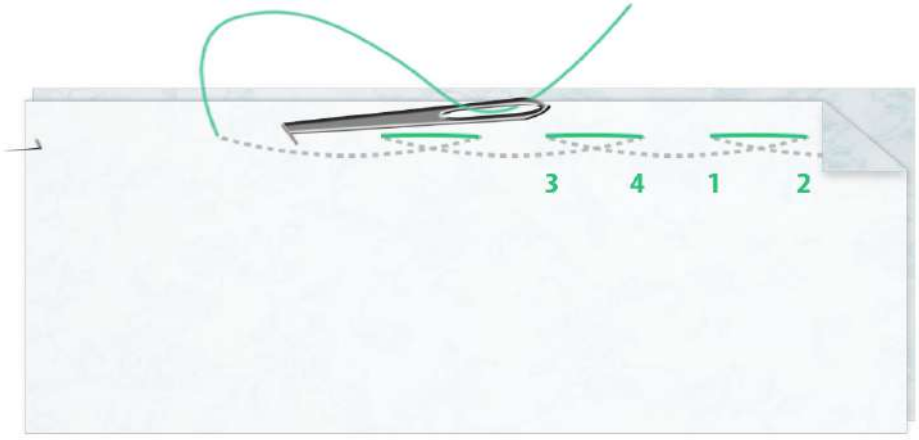


Fig-3.8

Summary

Hand sewing techniques will help in garment construction with or without use of sewing machine. Both temporary and permanent stitches are useful. Temporary stitches are more useful to the beginners in garment construction as they work as guiding lines to permanent hand or machine stitches.

Short Questions:

1. What is even basting?
2. What is uneven basting?
3. What is hemming?
4. What is slip hemming?

Long Answer Question:

1. Write in detail about temporary stitches with illustrations.
2. Explain in detail about permanent stitches diagrammatically.

UNIT-4

Seams and Seam Finishes

Structure:

4.0 Introduction
4.1 Types of Seams
4.2 Seam Finishes

Learning Objective:

- To learn different types of seams and seams finishes
- Creating design and line in the garments by application of various seams.

Unit preview:

This unit gives the idea of attaching of fabrics by using seam. The primary purpose is to know the different seams and using them for stitching different fabrics.

4.0 Introduction:

A seam is a method of joining two or more pieces of materials together by a row of stitching. The purpose of most of these seams is purely functional and can be called as constructional seams. Seams should be as flat as possible and unseen except those that are used for decorative purposes for garments, for garment design and line.

4.1 Types of seams

Seams can be classified into flat seams and ridge seams. Plain seam and flat fell seam are examples of flat seams. Ridge seams includes French seam. Seams may also be divided into conspicuous and inconspicuous seams. In conspicuous seams when finished will not have stitches seen on the right side of the garment. Examples are plain, corded and French. Conspicuous seams are those that have stitches seen on the right side of the garments like run and fell seam, lapped seam.

1. Plain seam

This is most widely used seam because it is easy to make. Requires less time and is pliable and inconspicuous.

Fabrics:

It is used on all types of fabrics except on very transparent kinds and is especially suitable for firm fabrics those do not ravel and will not be subjected to hard and frequent laundering.

Uses:

Plain seam is used especially for side seams, underarm seams and armhole seams. It is used on skirts, coats, petticoats, blouses etc.

Construction:

- To make this seam, place the two pieces of fabrics to be joined together right sides facing, matching the seam lines.
- Insert pins at right angles to the seams line and work a line of stitches following the seam line.
- Remove tacking and press the seam open.
- If the fabric is fine, both the seam allowances can be pressed to one side

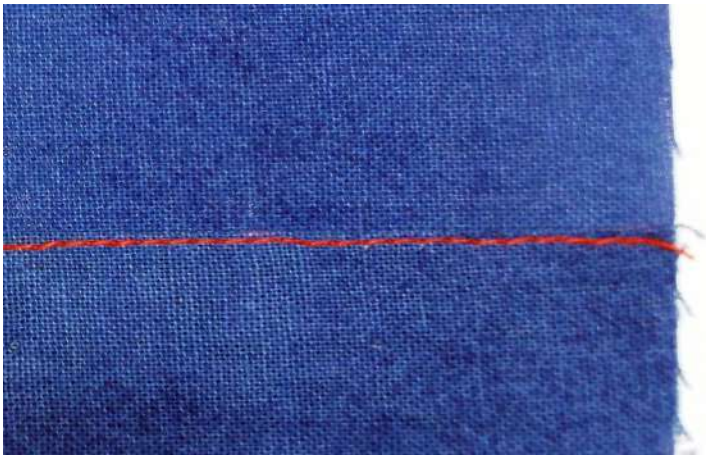


Fig-4.1 Plain seam

2. Flat fell seam:

Fabrics:

Denim, cotton, polycot, silk etc.

Uses:

This is flat durable seam used in men's sport shirts, work clothes, children's clothes and pajamas. However, it is time consuming and difficult to make on curved edges and bulky fabrics. It is functional as well as constructive seam.

Construction:

- Place the pieces to be joined wrong sides facing and stitch on the seam line.
- Press both seam allowances together in the same direction and trim the under-seam allowances to 1/8 inch and the upper one to 3/8 inch as shown in the fig 4.2

Fig- 4.2

- Turn under the raw edge of the side seam allowance so as to make a smooth fold ¼ inch wide.
- Keeping this fold in position with one hand tack the fold down flat to the garment.
- Machine stitch close to the folded edge on the right side of the garment.
- The right side of the seam will show two rows of stitching and wrong side will show only one row of stitching.

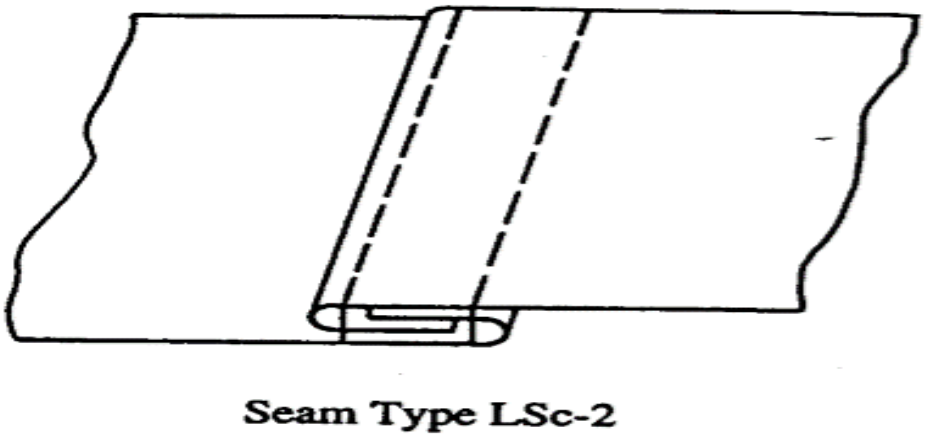


Fig 4.3 Flat fell seam

3. Lapped seam:

This is a conspicuous seam.

Fabric:

It is suitable for medium to heavy weight fabrics like cotton, linen, viscose, etc.

Uses:

This seam is commonly used for joining a gathered section to a straight edge as in a yoke.

Construction:

- Take a part of the garment which is to be laid on top and turn its seam allowance on wrong side.
- Place this piece on top of the second piece, right sides facing and making the fold to the seam line accurately.
- Tack in position and machine close to the folded edge.

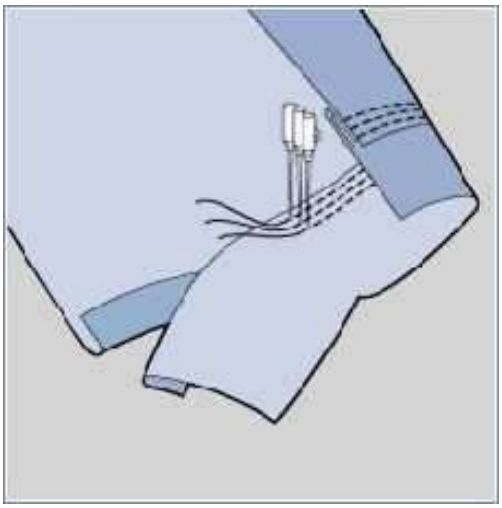


Fig 4.4 lapped seam

4.French seam:

Fabric:

This is a ridged seam and is used on transparent and light weight fabrics. It is suitable for sheer fabrics such as voile, silk etc.

Uses:

It is especially used on baby's clothes and delicate blouses. It is neat and durable finish as the raw edges are completely enclosed. However, it is time consuming and too bulky when used on thick materials. Do not use the seam on curves such as armholes and yokes.

Construction:

- The two pieces of materials to be joined are placed together with wrong side facing.
- Work a row of stitching 1/8 inch outside the seam line towards the raw edges.
- After stitching, trim the seam allowance to less than 1/8 inch.
- Press the seam and turn the work so that the right sides are together.
- Crease the first row of stitching so that it is directly on the edge.
- Pin or tack and stitch along the seam line about 1/8 inch from the fold.
- In this seam care should be taken to see that there are no ravels visible on the right side.

Fig 4.5

5. Bound seam:

This seam is formed by folding separate binding strip over one or more pieces of material and seaming the strip with one or more rows of stitches. They are frequently used as an edge finish at necklines, hems

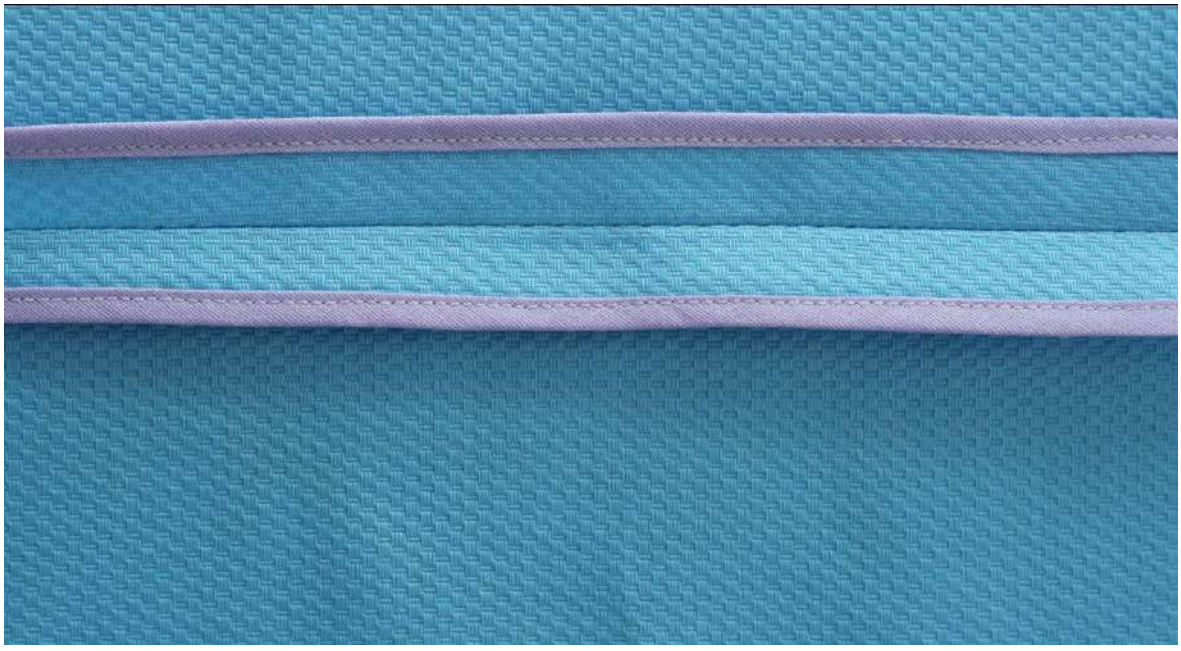


Fig-4.6 bound seam

Uses of bound seam:

- It adds decorative effects to the garment by adding on, other piece to the garments.
- It is decorative and functional seam.

6.Counter seam:

This is also a durable flat seam used for very thick materials, Men's wear and reversible garments. Turn down a little on wrong side of one piece of fabric and iron them firmly. Keep wrong side on the first piece of fabrics of fabric on the right side of the second piece along the edges. Maintain the seam allowances and tack it in position. Machine stitch along the folded edges. This is also called three layered counter seam.

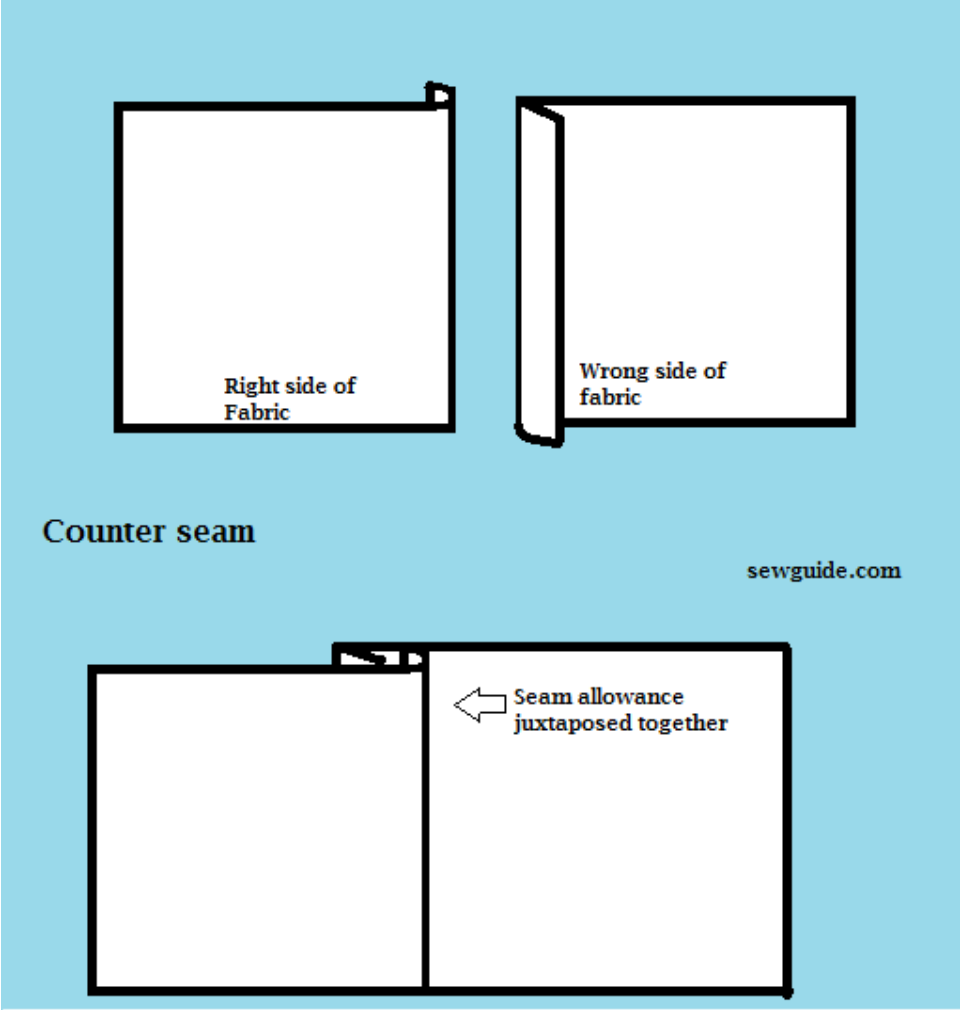


Fig 4.7 counter seam

4.2 Seam finishes

Seam finishes are made to prevent fraying of the raw edges and thus make the seams more durable. A seam finish is any technique applied to make the seam edge look neat and keep it from fraying. They also provide a neat appearance to the inside of the garment. Choose a seam finish that is quick and will not add too much bulk to the garments. There are several types of seam finishes in use.

Pinked finish:

- This is a quick method and is not bulky but is not a suitable finish for fabrics that ravel badly.
- After stitching plain seam trim off about 1/8 inch of the seam allowances using pinking shears.
- Then press the seam open

Fig 4.8 pinked finish

Double stitch finish:

- After making a plain seam, work an extra line of stitching about ¼ inch from the raw edge.
- This can be done for a plain unfinished seam or pinked seam.
- This is not suitable for bulky fabrics.

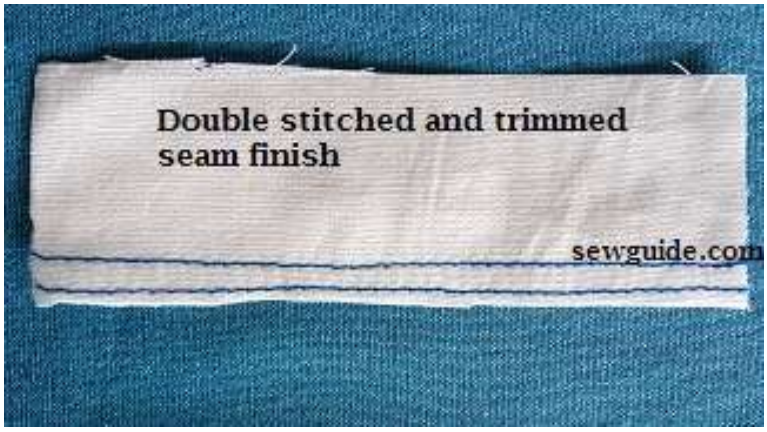


Fig -4.9 Durable stitch finish

Edge stitched finish:

- The seam is stitched and pressed open.
- Then turn under ¼ inch on each seam edge and top stitch close to the fold without catching the garments.
- This finish is used on unlined coats and jackets where a wide seam allowance is available.
- This is a bulky finish and is not suitable for deeply curved seams.

Fig 4.10 Edge stitched finish

Summary

This chapter deals with the different types of seams and seam finishes. Basically, seam is defined as joining of two pieces of garment. There are different types of seams which may be classified as conspicuous seams and inconspicuous seams or as flat seams and ridge seams. There are different types of seam finishes which are used to make the seam neat the edges of the seams like pinked seam, over casting seam etc.

Short questions:

1. What is a seam?
2. Classify seams.
3. In which fabrics flat fell seam is used?
4. Write about lapped seam.
5. What is bound seam?
6. What is pinked finish?
7. What is double stitch finish?

Long question:

1. Explain in details about plain seam.
2. Discuss about lapped seam.
3. Write in detail about seam finishes.

UNIT - 5

Creating Fullness in Garments

Structure

5.0 Introduction
5.1 Tucks
5.2 Pleats
5.3 Gathers
5.4 Shirring
5.5 Ruffles
5.6 Godets
5.7 Smocking

Learning objectives:

- To know how to introduce fullness in garments.
- The best methods of introducing fullness.
- Suitability of various fullness methods depending upon fashion, occasion, age etc.

Unit Preview:

In garment construction not only, sections are joined but also sections are shaped to fit the curves of the body to give fit and comfort. There are various ways in which garments are shaped depending on the amount of curve needed in the garments and the design of garment.

5.0 Introduction:

Fullness: It is a special feature introduced in garments to create variation in designing. It may be described as the concept used in garments to incorporate easy movement and comfort. Fullness helps to get proper fit and ease. Fullness controls the fabric drape.

Fullness is added into garments for making them comfortable and to add ease. Fullness in garments such as pleats and gathers are both functional and decorative.

Fullness bifurcates as follows: fullness controls and disposal of fullness. Fullness in a garment may be for holding of the fullness in a garment by the use of darts or may be used to release the fullness in the form of pleats, tucks etc.

Fullness is introduced into garments for various reasons such as:

- To give good shape and proper fit to the garment
- To allow freedom of movement and comfort to the wearer, and
- To make the garment look attractive.

5.1 Tucks:

A tuck is a fold of fabric stitched in place by running stitch or machine stitch in place on the right side of the garments as a means of shaping the garment to the body. For holding in fullness or add decorative effect at shoulders, waist lines, yoke, pockets or cuff of sleeves etc. the tucks that are partly stitched help in children's garments. These are also used in children's garments to hold the allowance for growth. Tucks add body to thin fabrics and textural interest to plain fabrics.

Tucks can be used in groups or clusters and in graduated width. When calculating the amount of materials that is needed, each tuck calls for an allowance equal to twice its finished width. So, for making a group of 4 tucks of 1/8 inch finished width extra 4*(1/8*2) = 1-inch extra material.

To stitch each tuck fold along middle so that stitching lines coincide. Then stitch along the markings cut the garment section only after completing the stitching of tucks.

Types of tucks:

Pin tucks

These are tiny dainty tucks used on baby's clothes and fine blouses. To stitch each tuck, fold along the middle of the markings. Tack or machine baste about 1/8-inch-wide from the fold. Fig 5.1

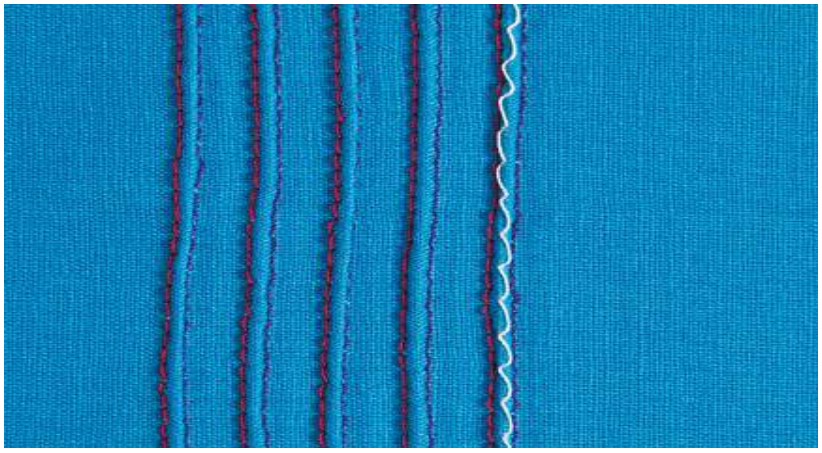


Fig- 5.1 pin tucks

Shell or scalloped tucks

This is a very decorative tuck made by hand or machine using small running stitches. As you come to each dot, take two over cast stitches through the dot and pull tight, before proceeding further with the running stitches. Fig 5.2

Fig 5.2 shell or scalloped tucks

Cross tucks

When rows of tucks are stitched along the fabric in both horizontal and vertical directions. The decoration is called cross tucking. First stitch the vertical tucks and press them to one side. Then stitch the horizontal tucks. Fig 5.3

Fig 5.3 cross tucks

5.2 Pleats

Pleats are introduced usually at the waistline of skirts and dresses to provide fullness evenly all around. One usually employs knife pleats, box pleats or inverted box pleats alone or in combination for eg a wide box pleat in the center front of the skirt with knife pleats on either side. Other types of pleats are kick pleats, cartridge pleats and pinch pleats. The preparation of pleats is similar to that of tucks, the main difference being that pleats are seldom stitched all the way down. Sometimes they are stitched part way down the garment for flatness. A point to remember is that to make each pleat you require two times the width of the pleat.
The different types of pleats are as follows:

Knife pleats
They are usually about ½ inch to 1 inch wide and are turned towards the same direction. The direction may be reversed at center back or center front of the garments. The figure shows two knife pleats tacked in position and marking for two more pleats.. Fig 5.4

Fig-5.4 Knife pleats

Box pleats

Two knife pleats turned away from each other (one to the left one to the right) form a box pleat. These are generally used on skirts of the school uniforms. Fig 5.5

Fig 5.5 Box pleat

Inverted box pleat

It is opposite of the box pleat. It is made up of two pleats turned towards each other so that the folds meet in the middle on the right side of the garments. Fig 5.6

Fig 5.6 Inverted box pleat

5.3 Gathers

Gathering is an effective and decorative way of distributing fullness over a given area. Gathers are graceful folds of fabrics that provide fullness, suggesting a soft look, which can be made using machine or hand stitches. These are formed by drawing the fabric together on a line of stitching and may be used to control the fullness around waist, yoke lines, waist lines, neck lines and upper and lower edge of sleeves. Gathering is done by different methods, such as:

Gathering by hand

Work two rows of running stitches ¼ inch a part 1/8 inch above and below the seam line. Draw the ends of threads until the section measures the desired length and secure the thread by winding round a pin as shown fig 5.7

Fig 5.7 Hand gathering

Gathering by machine

Make seam line on the right side of the fabric by adjusting the machine for long stitch and loosening the upper tension slightly. Now work two rows of machine stitches ¼ inch apart. Distribute the fullness evenly by pulling both bobbin threads together. Fig 5.8

Fig 5.8 Machine gathers

Gathering by using elastic

Gathers can be made by stretching a narrow strip of elastic and stitching the part of the garment which is to be together. Fig 5.9

Fig 5.9

5.4 Shirring or gauging

When several rows of gathering (3 or more) are used for a decorative finish these are termed as shirring. The rows should be evenly spaced. Shirring appears as a decorative feature at the shoulder, waistline, at the narrower parts of the garments also allowing a certain degree of stretching. Shirring can be done by these methods.

- Thread shirrs
- Elasticized shirrs

Fig 5.10 shirring

5.5 Frills or ruffles

These are used for the purpose of adding decoration to a garment. Sometimes they are used at the hems of skirts and dresses to add length to make frills, allow at least one and a half times the length of the piece to which the frill will be attached. The width of the frill is usually anything from one-inch o 3 inches. The longer side should be cut along the length wise grain of the material. The gathered edge of the frill can be concealed in a seam as shown in fig 5.11 with facing, binding or wide band.

Fig 5.11 Ruffle

Double ruffle

Gather the fabric to be ruffled through its center and stitch it to the garment through the center along the gathers. As an added trimming you can cover the gathers with a matching piping or narrow ribbon stitched in place on top of the gathers.

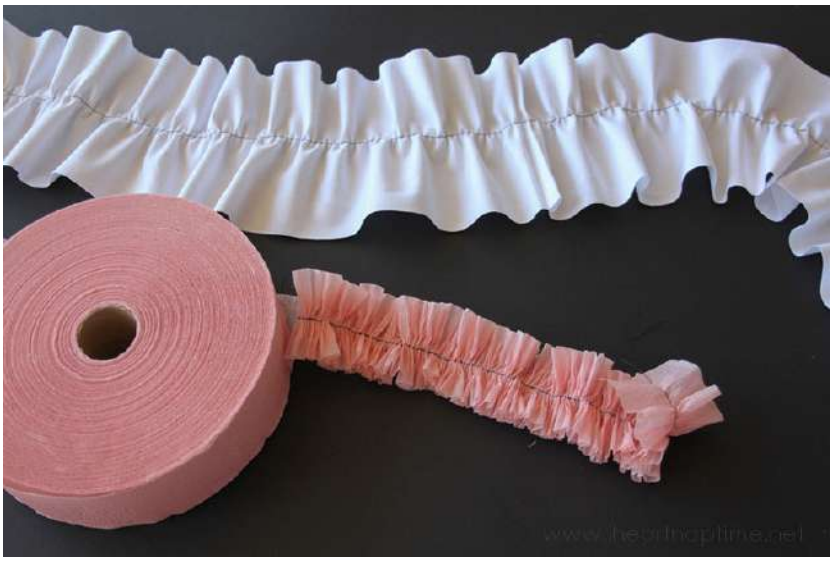


Fig 5.12 Double ruffle

Circular ruffles

A strip of fabric is cut in a circular shape so that the top edge measure equal to the part of the garment to which the ruffle is to be attached and the lower edge measure more. To apply circular ruffles, clip top edge, mark lines on which the ruffles are to be stitched, then tack and stitch.

Fig 5.13 Circular ruffle

5.6 Godets

These are wedge shaped pieces which are usually set into a skirt so that the wide side of the wedge becomes a part of the hem of the skirt. The godets may be set into a seam of the skirt or the skirt may be slashed so that the slashed edges form the seams that to which godet panels are joined.

5.14 godet

5.7 Smocking

It is a type of fabric enrichment, consisting of tiny embroidery stitches sewn over the folds of gathers at regularly spaced intervals on the right side of the fabric. It is used to hold fullness or to add textures and surface interest to a bodice, neckline or sleeves of children's or women's dresses. Best suited fabrics are soft and flat faced fabrics such as voiles, cambric and crepes. Use a medium weight and firmly twisted thread of cotton or silk for embroidery.

Gathering fabric:

Smocking on plain material requires marking with a series of dots on the wrong side. These dots should be evenly spaced around 0.3cm apart and the distance between the rows may be 0.5-1 cm. For heavy fabrics the distance between the rows may be 0.5 -1 cm. for heavy fabrics the distance can be more. Fabric with checks, plaids or dots do not require the transfer of the pattern. Using strong thread, pick up the dots along one row and make several running stitches, complete all the rows. The number of rows depends on the area to be covered. The width of the fabric should be three times more than the smocking area. Draw up the fabric on the thread and fasten the thread ends by tying them together, placed at one end to hold them securely. Fig 5.15

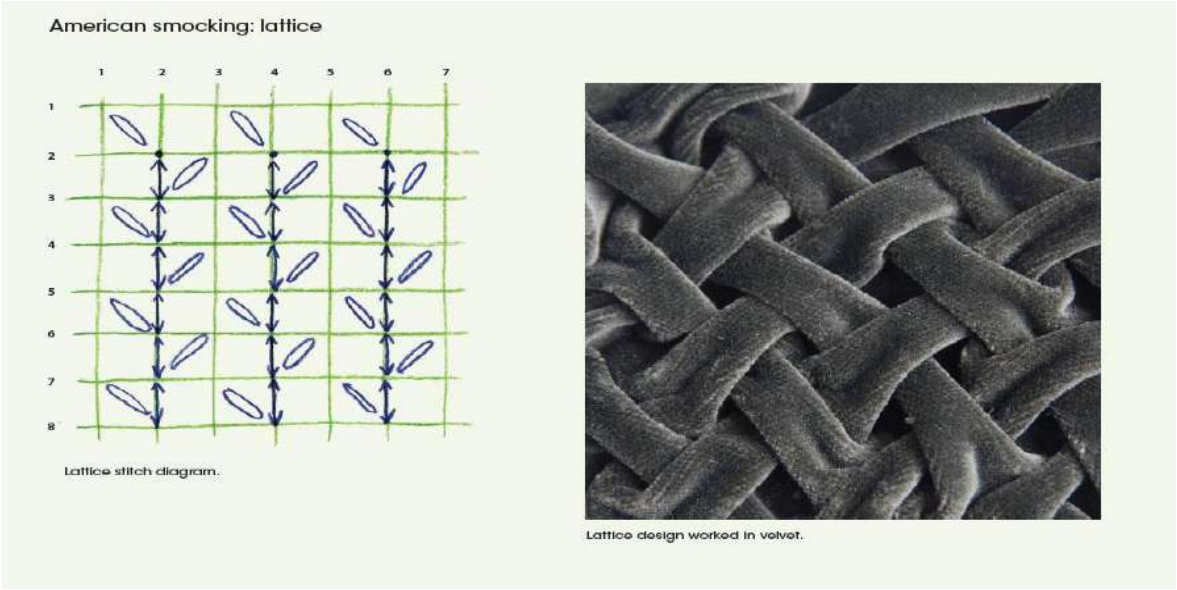


Fig 5.15

Stitches used for smocking:

All the stitches are worked from left to right. Good quality embroidery threads of suitable colour are used for smocking.

Outline stitch

This is like stem stitch used to make outlines. Work each row over the tubular fabric folds. Take out needle on the first fold on the extreme left by making small back stitch over the fold. While making the stitch, always keep the thread under the needle. Draw up each fold firmly, after each stitch is made. Fig5.16

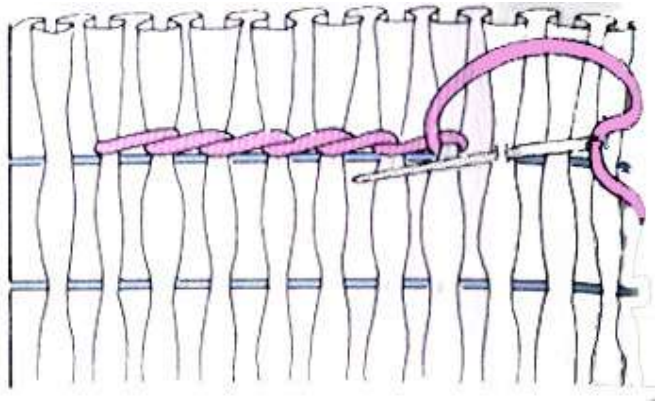


Fig 5.16

Cable stitch:

It is a variation of outline stitch done in two close rows. Start in the same way as for the outline stitch. While taking stitch, keep the thread above the needle for the first stitch and below the needle for the second, and repeat through the length of the row. Fig 5.17

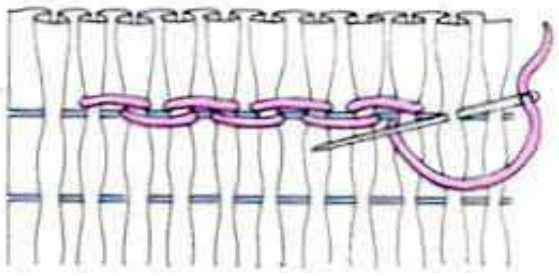


Fig 5.17 cable stitch

Wave stitch

To make wavy effect, make odd member (5,7,9) of outline stitches diagonally upward and then downward. For the upward row keep the thread below the needle and for the downward row keep the thread above the needle. Repeat the process to make rows of diamond shapes or rows of wavy design. Fig 5.18

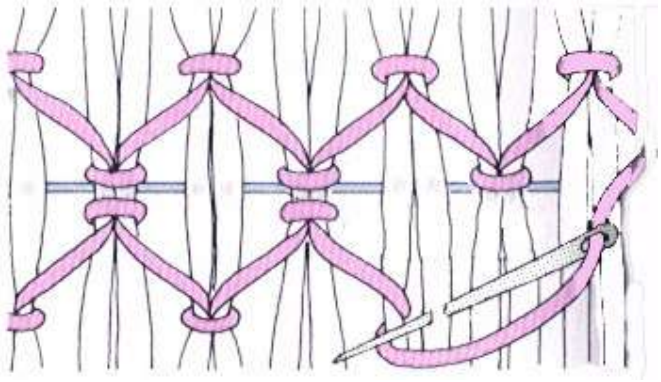


Fig 5.18

Honey comb smocking

To start with, bring the needle out in first pleat; take two tiny back stitches over fold to secure the thread. Pull the needle through the first fold about 0.5 cm below the first stitch, keeping the thread above the needle with thread below the needle, put the needle through the second fold at the same level. Draw the thread tightly together. Put the needle through the same fold at the same level as the first stitch with thread above the needle, put the needle through the third fold at the same level. Draw tightly together. Repeat till the end of the row. fig 5.19

Fig 5.19 Honey comb stitch

Summary

Fullness is most desired element of the garment. There are two types of fullness introduced in a garment by controlling the release of the material in the garment with the help of darts and by releasing the fullness with the help of different elements such as pleats tucks etc. The fullness is used to give a proper shape to the garment to which it is applied.

Short questions:

1. What is a tuck?

2.Mention the types of tucks.

3.List out the types of pleats.

4.What is a pleat?

5. What are gathers?

6. What is shirring?

7. What are ruffles?

8. What are godets?

9. Mention the stitches used in smocking.

10. Mention the types of gathers.

Long questions:

1. Discuss the types of tucks.

2. With the help of diagram explain about types of pleats.

3. Explain in detail about gathers.

4.Write in detail about smocking.

5. Describe ruffles with suitable diagrams.

UNIT- 6

Plackets

Structure

6.0 Introduction

6.1 Standards of good plackets

6.2Types of plackets

Learning objectives:

- To learn the requirements of good placket
- Types of plackets and finishing the placket opening

Unit preview:

Plackets are the finished openings made in the garments to put on or take off garment easily. This chapter helps us to understand the methods employed for finishing placket opening, so as to improve the quality of the finished garments.

6.0 Introduction

The finished placket openings in the garment are kept close with the aid of fasteners such as zips, buttons and button holes, press buttons, hooks and eyelets etc. They are used at waist lines, necklines, wrists and other snugly fitting parts of garments. A placket may be made in, an opening left in a seam or in a slash cut in garments. The former is stronger and gives a better finish when completed.

6.1 Standards of good placket

A good placket should meet the following standards.

6.1.1 Neatness and invisibility

A placket should be as inconspicuous and flat as possible, unless used as a decorative detail. It should not be bulky, puckered or stretched. Fastening should hold securely and should be no gaping edges.

6.1.2 Suitable length and convenience:

Placket opening should admit the body parts easily so plackets for neck should be 9 inches to 12 inches long. Skirts opening should be long enough (about 7 inches) to ensure that the garment can pass over the shoulders and hips without strain. Wrist opening can be about 4 inches long to enable the sleeves to pass over the hand. The position of the placket should be such that it is easily accessible and convenient to operate.

6.1.3 Strength

Openings are subjected to strain during wear and should be strengthened at the closed ends e.g., lower ends of plackets openings. The garments seam should be minimum 5/8 inch wide.

6.1.4 Correct Lapping:

All opening for the women's garments fasten right over left irrespective of where they are located for men's garments, opening should lap left over right when worn.

6.1.5 Suitability

The type placket used should be suitable to the kind of garments on which it is used, its position in the garment, textures of fabrics, age, sex of the wearer.

6.2 Types of placket

Plackets can be classified in two types
(a) Inconspicuous plackets
(b) Conspicuous plackets

6.2.1 Inconspicuous plackets

The continuous bound plackets, bound end faced plackets and zipper plackets are examples of inconspicuous plackets. Inconspicuous plackets are not visible when the garments are worn.

6.2.1.1 Continuous bound placket

This is also called one-piece placket and can be made in a seam or slash. It is suitable for children's dresses, undergarments like saree petticoat, and for sleeve openings, where a cuff or band is used. This placket should not be used on curved seams and on bulky fabrics.

Fig 6.1 continuous bound placket

This placket can be made in an opening made by slash or in a seam opening. To make a placket in a slash, cut a strip of fabric on the lengthwise grain, ¼ inch to ½ inch wide and one inch of fabric on the lengthwise grain of the opening. Tack the piece to garment openings and machine stitch keeping the opening flat till the center. Stop the machine keeping the needle inside the fabric and push all the material backward so as to avoid a pleat in the center of the fold, continue stitching till the end.

Press the seam edges towards the placket strip and fold under the free edges of the strip ¼ inch and crease. Then fold the strip over the opening edge and hem it along the stitching line.

Fold the strip under the overlap section and tack it at the seam. Tacking can be removed after the fasteners are fixed.

Plackets in a seam is done in almost similar way as placket in a slash. Prior to making a placket reinforce the seam edges (where the placket ends) with back stitches, clip the seam allowances leaving only ¼ inch allowances. Now the seam opening is ready to be finished as continuous bound plackets.

6.2.1.2 Bound -and- faced placket or two-piece placket.

This is used in the left seam of skirts or petticoats and back seam of dresses. The under-lap side of this plackets is finished with a binding and the overlap with a facing. For this, two separate strips of fabric are used. Wider strip of 2 inches used for under lap and narrow strip of 1 ½ inches is used for overlay.

Both the strips should be 1 inch longer than the placket opening so as to extend below the placket opening. The seam allowances of the placket should be same as the seam allowances on which it is made. To finish under lap, crease the string back over the seam, bringing its free edge to the wrong side of garment, turn under ¼ inch at the free edge and hem the fold to the stitching line. This forms the bound side of the placket and should have ½ inch to ¾ inch finished width.

6.2 Bound -and- faced placket or two-piece placket

Take a ¼ inch or wider stitch to the wrong side of the over laps free edge, turn the strip over to the wrong side of the garments (as for a facing) and slip hem the fold to the garment. Work a line of stitches at the base of the plackets,

catching the under lap and overlap together (fig 6.2). This can be done by hand from the wrong side in such a way that no stitches are visible on the right side.

6.2.1.3 Zipper placket

There are different methods of applying zippers. The choice depends on the position of the zipper in the garment and the type of garment. Zippers are usually concealed either with two overlapping fabrics edges or with one. The former shows two lines of stitching and is referred as slot seam zipper plackets (fig 6.3). The latter is called lapped seam zipper placket and only one line of stitching is visible on this.

Fig 6.3 slot seam zipper placket.

Close the placket opening temporarily by machine basting from A to B as in with the zip closed, place it face down over the pressed open on the wrong side of the garment as in fig. 6.3. the center of the zipper should face exactly on the machine basted seam line. Match bottom of the metal part of the zipper to bottom of machine basting at B. The top of the zipper should be ¼ inch below the finished placket line. Keeping the zip pulled taut and baste firmly along each side of the zipper. At the bottom baste across the zipper tape from B to C about ¼ inch below the metal part of the zipper. Do the final top stitching from the right side of the garment by machine.

6.2.2 Conspicuous openings and plackets:

Tailored plackets are conspicuous plackets commonly seen on men's shirt, sleeves and on neck opening on kurtas and children's dresses.

6.2.2.1 Kurta placket

This is a simple neck finish used for kalidar kurtas, women's kurtas, etc. to make this, slash the opening down from the neck at center front or center back and apply bias binding to the openings.

Fig 6.4 kurta placket

Take fabric strips of length 1 ¼ inch more than the placket opening. The under lap of the placket is finished with a facing of width 1 ¼ inch (includes seam allowance). Attach the strip from the right side of the kurta and turning over to the right side with an extension of ½ inch. The overlap is attached to the other opening of the placket with a fabric of width 1 ½ inches. Attach the placket strip from the wrong side of the kurta opening, fold and stitch on to the right side of the kurta with an extension as facing over the under lap. Neatly finish the edges of the overlap of the placket all around as in fig. 6.4

Summary

All the garments require opening which is added in the form of plackets. These are finished openings in the garments which make the wearing of the garments an easy task. The placket needs to be as flat as possible and should be durable. The attachment of the plackets varies for both men and women's garments, for instance plackets should lap right over left for women's garments and left over right for the men's garments.

Short questions

1. What is a placket?
2. Mention the types of the plackets.
3.List out the garments where zipper placket is used.
4. What is kurta placket?

Long questions:

1.Describe the standards of a good placket.
2.Write in detail about continuous bound placket.
3. Write in detail about zipper placket.
4. With the help of diagram explain about kurta placket.

UNIT -7
Neckline Finishes

Structure

7.0 Introduction

7.1 Bias and its uses

7.2 Bias facing

7.3 Bias Binding

Learning objectives:

- To learn the importance of bias
- To learn the finishing of the necklines using bias facing and binding.

Unit preview:

This unit explains the various methods of finishing necklines edges.

7.0 Introduction:

Neckline is an outline of bodice around the neck. It can be shaped in different ways and styles to get a decorative effect, particularly for lady's garments. Round, square, V-neck, U-neck line are the most commonly used basic shapes of necklines.

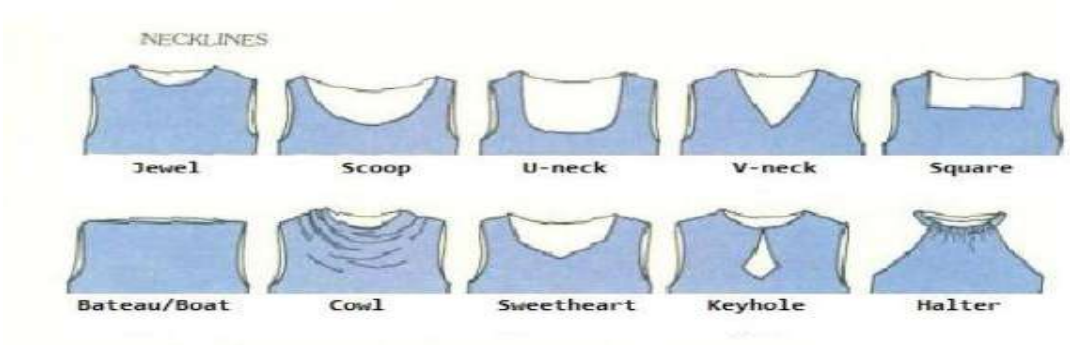


Fig 7.1 Different shapes of neck lines

Different methods of finishing necklines:

A neckline may be finished with a lace or binding or a collar. The type of finishes chosen will depend on the design of garments, the fabric and in some cases even personal preference. Necklines are generally curved and hence tend to stretch during handling. It is therefore important to note that before garment construction, a row of stay stitching is done at distance of 0.5cm from the edge of the neckline, so that it will not stretch during the stitching process.

A straight piece of material attached to a curve will look bulky and untidy. The elasticity of bias permits it to stretch and take the shape of any curved edge giving it a flat smooth finish. Bias strips can be applied as facings and bindings.

7.1 Bias and its uses:

True bias falls on a diagonal line at 45 degrees to the length wise and cross wise grains. It has maximum elasticity or in other words it stretches more than any other direction on cloth (fig 7.2)

Fig 7.2 preparation of bias strip

Cutting bias strips:

Fold the fabric diagonally so that the length wise threads of the folded part fall parallel to the cross wise threads on the rest of the material using a gauge or ruler, measure from the fold to desired width of bias strip and draw parallel

lines. Cut strips along the marked lines and trim off ends along warp threads. (fig 7.3)

Joining of bias strips:

Place the two strips to be joined right sides facing and the edges at right angles to each other. Shift the top strip ¼ inch beyond the other so that the sharp points at the ends of the strips project on either side. Stitch a ¼ inch seam joining the points where the sides of the two strips intersect. Press the seam open and trim the seam projections showing on right side. (Fig 7.3)

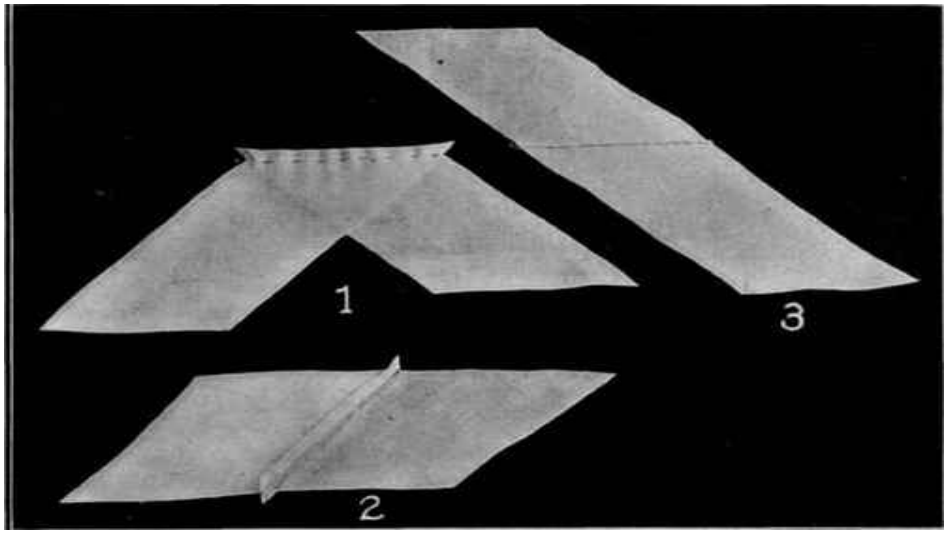


Fig 7.3 – cutting and joining of bias strip

7.2 Facing

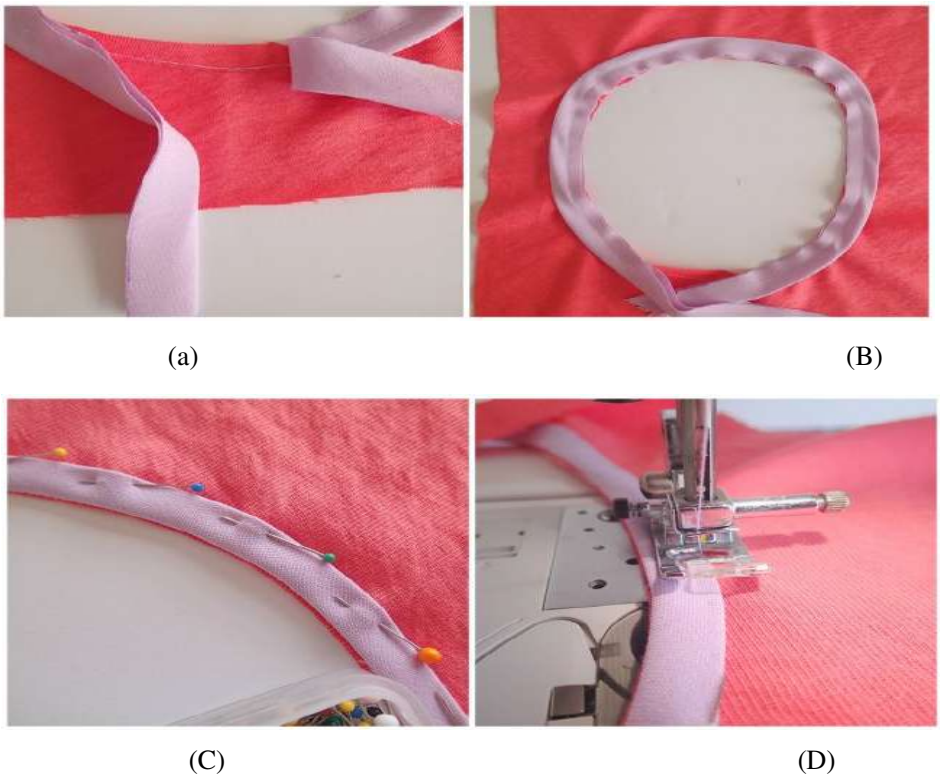
These are used to provide a neat finish to the raw edges in a garment and o support the shape of necklines, arm holes, collars etc. when the edge to be faced is a straight line, the facing may be cut in one piece with the garment section. Usually facings are applied separately. There are two types of applied facings- bias facing and shaped facing.

Shaped facing can be of any width but bias facing should not be more than ½ inch wide. Facings are usually turned to the inside of the garment and will not show when the garment is worn. Sometimes facings are turned to the outside of the garment for decorative effect.

a. Method of applying bias facing:

Stay stitch edge of garment to be faced. Take bias strip to edge of garment, right sides facing beginning at a seam. For inward corners to be faced the bias

must be eased and for outward curves it must be stretched (easing means holding bias strip slightly loose at the seam line). Stitch bias to the edge of the garments in line with the bias on top. Trim the seam to ¼ inch, clip at curves, grade bulky seams and ends coinciding. Turn the strip to wrong side, under stitch the facing to the seam making sure that the facing is not visible from the right side of the garment. Now hem or slip stitch the facing to the garment. When finished the bias facing should be about 3/8-inch-wide (fig 7.4)



(a) (B)

(C) (D)

Fig 7.4 Applying bias facing

b. Applying shaped fitted facing:

Shaped facing is cut to the exact shape of the garment edge to which it is to be applied. Usually it is cut on the same grain as the section of the garment. Shaped facing is often used to finish square or V-neck lines or scalloped edges. It is easier to apply fitted facing than bias facing and is less conspicuous. It is usually cut separately for front and back. After cutting, join the front and back facing with a plain seam, trim the seam and press it open. Finish the outer edge of the facing by turning up the edge and stitching it. Carefully tack the facing and seam lines, center lines and notches matching. Trim, clip and grade seam edges turn the facing to the wrong side under stitch it at the seam and hem or slip stitch the folded edge of the facing to the garment. Fig 7.5

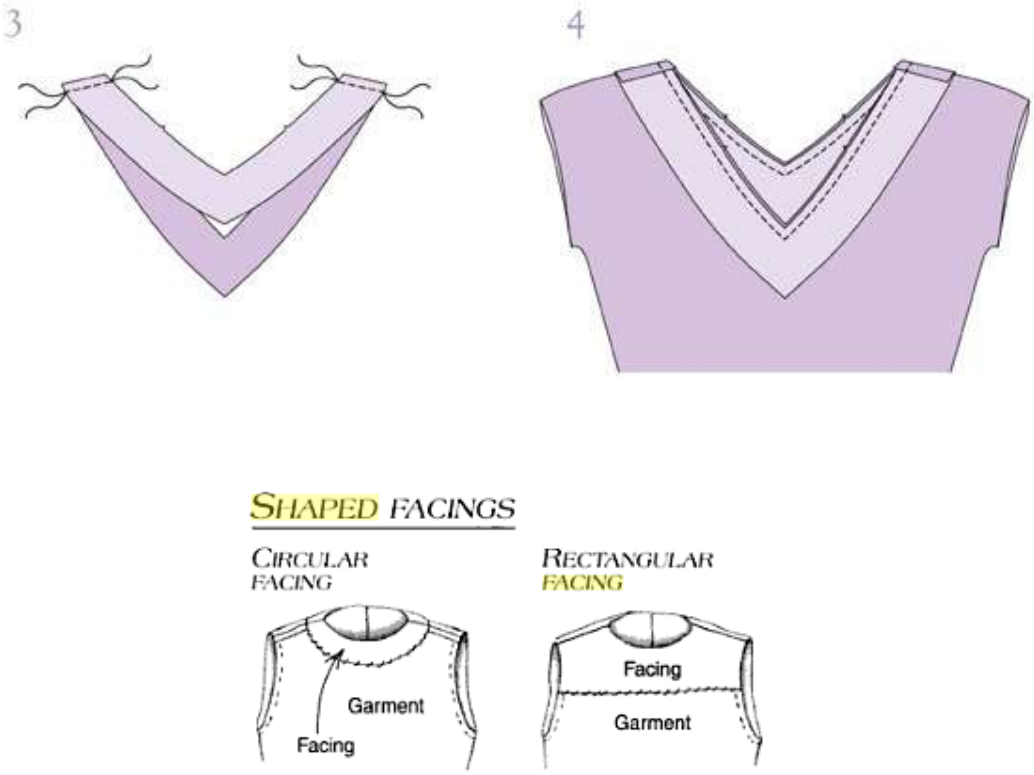


Fig 7.5 Applying shaped or fitted facing

7.3 Binding

Bias binding:

Bias binding is used to finish and strengthen raw edges and, to add a decorative trim to a garment. It shows both on the right and wrong sides. It is used to finish necklines, armholes, sleeve edges, front closings, collars, cuffs and seams. It can be adapted equally well to straight, curved, gathered and irregular edges. When finished, bias binding should have uniform width (less than ¼ inch) and should lie flat and smooth without any stitches showing on the right side of the garment.

There are two kinds of bias bindings: Single binding and double binding (or French binding)

a. Single bias binding:

Cut a bias strip that is twice the finished width plus two seam allowances. Tack the strip to the garment right sides facing. Stitch the binding to the garment

with plain seam. Trim the seam as wide as the finished binding. Turn under 1/8 to ¼ inch on the outer edge of the bias and fold it over the seam on the wrong side. Now hem the fold to the line of stitching using hemming. Fig 7.6

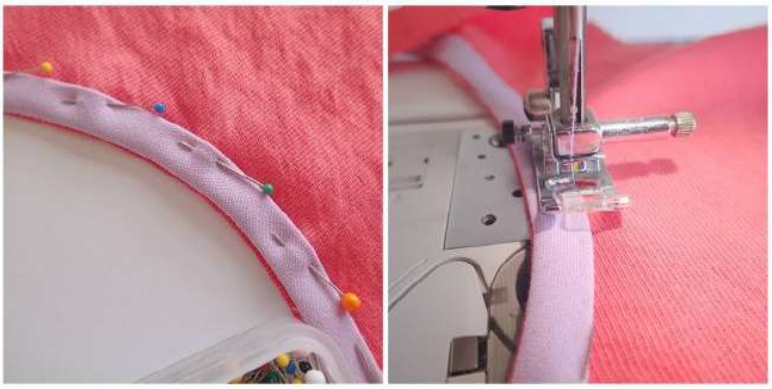


fig 7.6

b. Double bias binding:

Double bias binding or French bias is used on sheer fabrics. Cut bias strips that is six times the desired finished width. Fold the strip in half wrong sides together and press. Stitch raw edges of binding to the garment on the right side and hem the folded edge to stitching line on the wrong side. Fig 7.7

Fig 7.7 Double bias binding

Summary

There are mainly three types of neckline finishes such as facing, binding and finishing with collars. Bias is any piece which is cut diagonally at 45 degree the length wise and crosswise grains. The bias pieces are used in finishing the curved edges. These pieces may be used in binding and facing of the neck line.

Short questions:

1.What is a bias?

2.Write two uses of bias.

3. What is binding?

4.What is facing?

5. Mention the types of binding.

Long questions:

1. Explain the method of joining bias strips with diagrams.

2. Explain about bias facing with illustrations.

3. Write in detail about bias binding.

UNIT- 7

Types of Fasteners

Structure

8.0 Introduction

8.1 Types of fasteners

8.2 Buttons and Button holes.

Learning objectives:

- Selection of right fasteners for a particular garment.
- Types of fasteners suitable for men's, ladies and children's garments.
- Stitching of different fasteners.

Unit preview:

All garments need openings at some point or the other so they can put on and taken off easily. These openings can be closed in a variety of ways by using fasteners. The common fasteners are buttons, hooks and eyes, eyelets and cord etc.

8.0 Introduction:

There are various types of fasteners. Some are decorative and conspicuous while others are meant to be inconspicuous. The common fasteners are buttons and button holes, buttons and loops, press buttons, hooks and eyes, eyelets and cord (for lacing), zip fasteners and tapes and ties. In general, fasteners should be fixed in such a way that the right side of the garment laps over the left side for the women's and the left laps over the right for men. Fasteners should be selected to suit the colour, design and texture of the fabric. The style and use of the garment and position of the placket. You should also consider the age and sex of the wearer. For example, buttons and button holes are generally used for men's shirts, trousers etc. Just as press buttons and hooks and eyes are commonly used for lady's cholis and children's dresses.

Types of buttons:

Buttons should be selected to suit the colour, design and texture of the fabric and the style of the garments. There are two types of buttons**:**

Buttons with holes

Fig 8.1 buttons with holes

Shank type buttons: These are attached to the garment from the underside.

Fig 8.2 shank button.

Buttons may be made of fabric, bone, glass, metal, plastic etc. On dresses buttons covered with self-fabric may be used. If you provide scrapes of fabric to well establish tailors, they get the buttons covered by a special machine, covering may be done by hand also.

Marking positions of buttons:

To mark positions for buttons, place overlap over the under lap so that the center front line coincides. If the button holes are horizontal insert a pin through the button hole about 1/8 inch from the end which is near the center front as A in fig-8.3 for vertical button hole, put the pin through the middle of the button hole B shown in fig- 8.3. lift over lap and mark position of button on the pin mark.

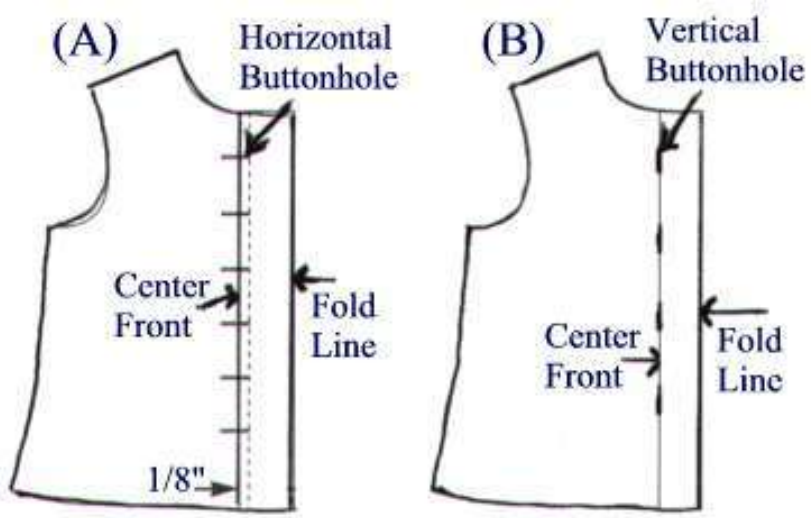


Fig – 8.3

Link buttons

These are used as links for cuffs or for the front of a coat or a jacket. There should be two button holes, one on each side of the placket opening. To make the link, hold two buttons at the desired distance and connect the buttons together with strands of threads. Work button hole stitches across the strands and fasten the thread.

Fig 8.4 Link buttons

Snaps or press buttons

These are used to hold edges that will not have much strain, when the garment is worn. They will open out if used on snug fitting parts. These are available in various sizes and weights. They are either black or silver. These fasteners have two sections one section has a knob and the other has a socket. The knob section is placed on the wrong side of the overlap and the section with the socket on the under-lap side.

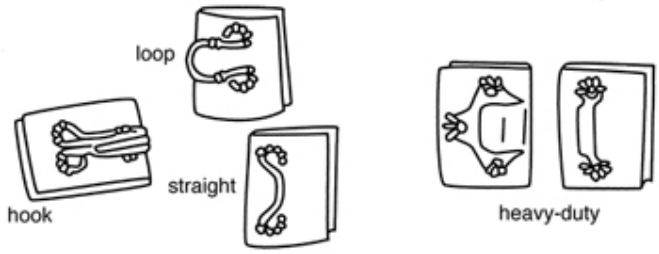
Fig 8.5 press button.

Hooks and eyes

These are used on placket where there is cross wise strain. They form an inconspicuous closing. They should be placed close to each other without much space in between to prevent the opening from gaping. The hook should be placed 1/8 inch inside the finished edge of the overlap on the wrong side. Work button hole stitches or over casting stitches around the rings of the hooks. Then slip the needle through the fabric and bring it out near the hook end. Take several back stitches across and under the loop of the hook to hold it down firmly. Fasten off with small back stitches. The stitches should not show on the right side. The eyes may be of metal or worked with thread. Thread eyes are used on blouses and dresses made of fine fabrics. They can be made to match the colour of the garment so as to be inconspicuous. To find the exact position for stitching this eye, lap edge with hook over the under lap in proper position and mark the end of the hook with a pin. At this position work a few back stitches long enough for the hook to pass and then work button hole stitches over these threads. Fasten the thread firmly on wrong side.

Fig 8.6 Hook and eye

Metal eyes come in two types:



1. The straight eye is used for over lapping edges as shown in the figure 8.7.

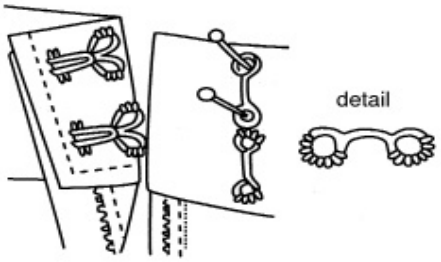


Fig 8.7

2. The round eyes are used for edges that meet each other as shown in fig 8.8

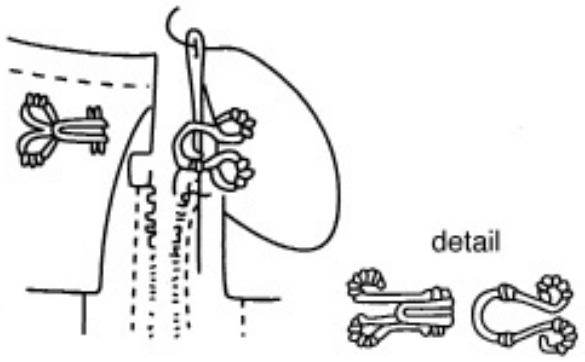


Fig 8.8

The straight eye is positioned the same way as the thread eye, but the round eye placed on the wrong side of the under lap and must extend 1/8 inch beyond the edge of the under lap. To fix metal eyes, work button hole stitches around their rings.

Eyelets and cord:

Eyelets are mainly used for lacing front openings decoratively as shown in fig 8.9. to make an eyelet cut a circular hole and work button hole stitches around the edge.

Fig 8.9

Fancy buttons

These are buttons generally used for decorative purpose. They are mainly false buttons which are used for not closing the plackets. They are worked on the right side of the garments. These buttons are commonly used on children's or ladies garments to give decorative details in the garment. They are readily available in the market in wide range of colors, shapes, textures and made of different materials like fabric, plastic, metal, wood etc.

Fig 8.10 fancy buttons

8.2 Button hole:

Button holes are slits cut in garments to hold buttons in place. The raw edges of the slits are finished with button hole stitches, zig-zag stitches or fabric binding made of sell or contrasting material. Button holes should be worked on the overlap before the buttons are fixed. They may be placed vertically or horizontally on the garment.

Horizontal button holes:

These hold the front securely even on tight fitting garments. They began about 1/8 inch outside the center front line, cross the center front line and extend into the garment as shown in the figure 8.10 (A).

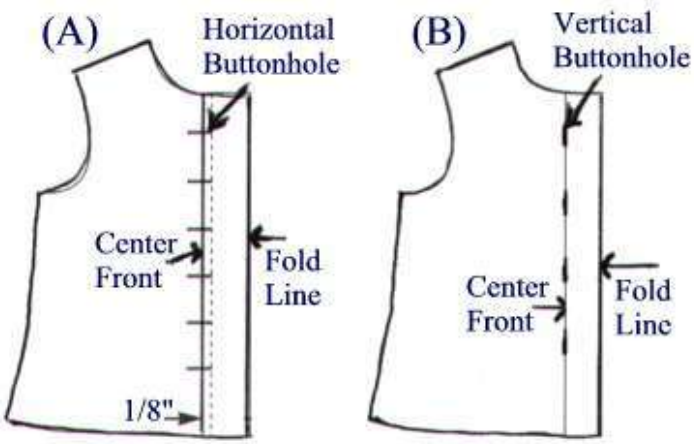


Fig 8.10

Vertical button holes:

Vertical button holes are worked on the length wise grain and exactly on the centre front line parallel to the center front edge as shown in the fig 8.10 (B). They are used for shirts, pants, fly openings where there is no great strain across the garments.

Whether the button hole is vertical or horizontal, buttons are placed exactly on the centre front line shown in the figure 8.10(A) and 8.10 (B). The allowance of material beyond the center front line should be at least ½ inch or half the diameter of the button used.

Length of the button hole:

The length of the button hole should be the diameter of the button plus about 1/8 inch (or the thickness of the button). The easiest way to determine the correct size of the button hole is to cut a slit in a scrap of fabric and adjust the length until the button slips through easily.

Types of button holes:

There are two types of button holes.

1. Worked button holes

2. Fabric or bound holes

Worked button holes:

Uses: These are used on children's and men's garments and are worked after the garment is completed. Avoid these on fabrics that stretch and fray. Button holes can be worked by hand or machine. Readymade shirts usually have

machine worked button holes. They can be done with an automatic machine or with an ordinary machine which has a button hole attachment.

Hand worked button holes:

These are used where details of construction are to be finely finished. They should be made with matching thread and should have stitches of uniform length worked close together. Although blanket stitch can be used. The button hole stitch illustrated in fig 8.11 is to be preferred since it produces a much firmer knot at the slit.

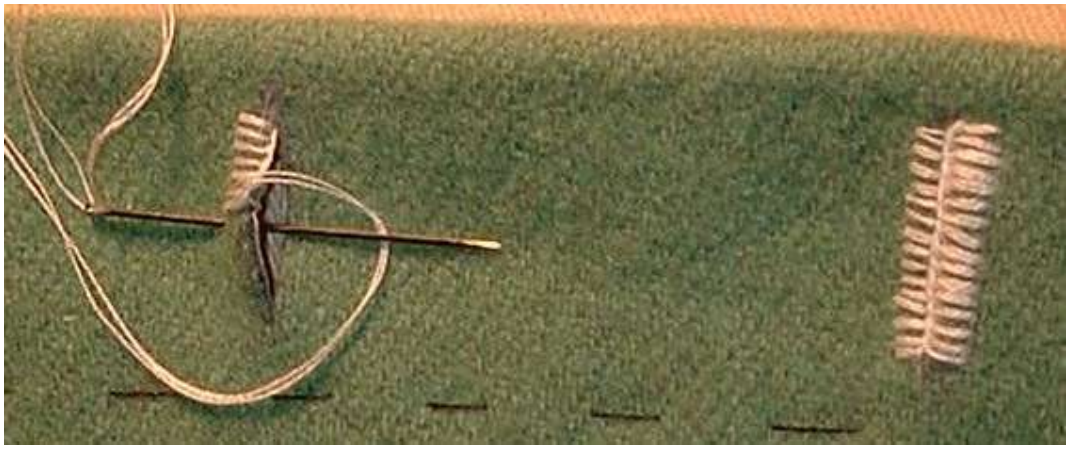


Fig 8.11

If the hole is a horizontal one it usually has a round end or fan end near the centre front edge (at A in fig8.10) to accommodate the shank of the button and a bar or square end at the other extreme (B in fig 8.10) to keep the hole in a good shape and prevent gaping. Vertical button holes are usually made with two bars or square ends. Fig 8.11

Fabric or bound button holes:

These are more decorative than worked button holes and are suitable for women's and children's dresses. The decorative possibility arises from the use of a strip of material to cover and bind the raw edges of the hole. The binding shows on the right side in the finished button hole and may be made of the same material as the garment or of a contrasting material. Usually the binding strip is cut so that its lengthwise grain runs along the length of the button hole. The facing can be applied only after all the button holes are finished. To provide a double layer of cloth for making the button holes an inter facing is used. The facing finally covers and conceals the working on the wrong side.

Button loops

Instead of button holes, loops may be used to fasten buttons. These may be made of thread or cloth.

Thread loops

The thread loop is an inconspicuous fastening which is most often found at the neck edge of collars. To make a thread loop, sew four or five strands of matching thread on the under lap in the correct position. Then work button holes stitches over these strands. fig 8.12.

Fig 8.12

Fabric loops:

These are made of strips of bias fabric stitched and turned inside out to form a narrow tube. The fabric used may be of self- material or harmonizing material. This type of fasteners adds a decorative trim to children's and women's garments.

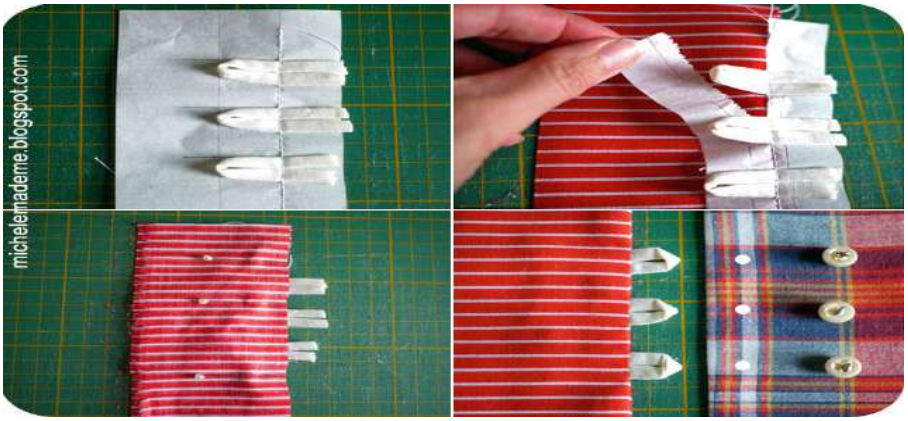


Fig 8.13

Corded loops:

These are made the same way as ordinary cloth loops except that a cording is placed inside the bias strip.

Corded frogs:

These are very decorative and can be made in varied designs. Button loop of the frog should be long enough to slip over button smoothly.

Fig 8.15

Summary

All garments need opening at some point or the other so that they can be put on and taken off easily. These opening can be closed in a variety of ways. The type of closures selected will depend on the position, the amount of strain it will receive and whether it is to remain concealed or form a decorative feature on the garment.

Short question

1. What is a fastener?
2. Write about press buttons.
3. Mention the types of buttons holes.
4. What are link buttons?
5. Write about fancy buttons.
6. Write about hook and eyes.

Long questions

1. Explain about different types of buttons.
2. Write the working procedure of button holes.
3. Describe in detail about button loops.
4. **Write short notes on** –

a. Link buttons
b. Snaps
c. Eyelets and cord

UNIT -9

Importance of Paper Patterns

Structure:

9.0 Introduction

9.1Types of paper patterns

9.2 Contents of patterns

9.3 Uses of paper patterns

Unit preview:

Pattern of a garment is the blue print on which the fabric is cut. Patterns are prepared by a method called drafting. Each pattern has the details of instruction used to cut the fabric for garment construction.

9.0 Introduction:

Designing a garment should be aimed at the expressions of individuality, fashion sense and comfort. For designing and developing good styles, appropriate patterns are a must. Pattern making is the first step in stitching. Patterns are the basic blocks of dress designing and skill is required to interpret the details while constructing garments.

Paper pattern:

Pattern making is a highly skilled technique which calls for technical ability. For successful dress designing pattern making forms the fundamental step. A basic pattern of a garment can be prepared by one of these two methods-

- By drafting
- By draping fabric on a model or person.

Drafting may be defined as a system of drawing patterns on paper with mechanical precision on the basis of body measurements. The basic pattern is developed may

be modified to develop patterns for variedstyles. This is also called as flat pattern designing. The basic pattern is also referred to as sloper, block, marker or foundation pattern.

9.1 Types of paper pattern:

Paper patterns are made and are of two types- commercial patterns prepared on the basis of standard measurements and patterns drafted using personal measurements.

1. **Commercial patterns:**

Commercial patterns are usually done on tissue paper. Since tissue paper is not bulky, it allows many pieces of patterns to be packed compactly in an envelope. Good patterns are carefully labeled with the following information – pattern size, name of each pattern (back, front, sleeve etc.), number of pieces, notches, buttons and button alteration locations. In addition, sheets of explanation, steps involved in using the pattern to cut the garment, method of cutting, specific fabrics with different textures and prints, method of construction and fabric suitability.

Commercial patterns for women and children are usually sized according to bust measurements. Pants and skirts according to waist, hip and length measurements. Hence before selecting the patterns, you should take the body measurements accurately and buy the correct size. The measurements are cited on the pattern envelope in some of the good commercial patterns.

9.2 contents of paper patterns:

A paper pattern should contain the following information as given in fig 9.1

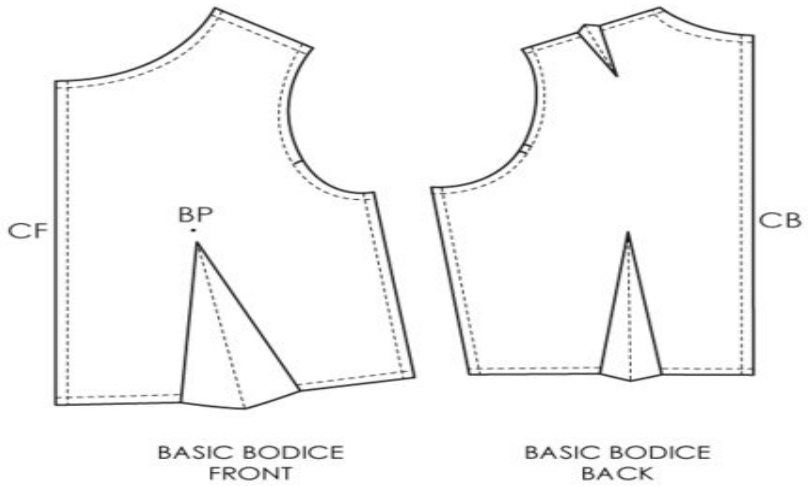


Fig 9.1

- Name of the block e.g. bodice front, back, sleeve, collar, yoke, pocket etc.
- Grain line on each pattern piece.
- Size e.g. 32, 34, 36,38 etc.
- Centre front and centre back.
- Style number and code number of the pattern
- Pattern piece e.g. skirt front or back.
- Cutting information -how many pieces to cut e.g. cut 1, cut 2, cut on fold.
- Notches- marks needed to help in assembling of the garment. Marking of seam allowances

9.3 Uses of Paper Patterns:

1. Paper patterns are useful not only to the beginner but also to the expert
2. It is particularly useful to the beginners as it is a better method of learning than cutting the material directly.
3. Paper patterns can be preserved and used whenever required and is therefore time and labor saving.
4. Adjustments in paper patterns can be done to ensure perfect fitting.
5. By using basic paper pattern it is possible to bring changes in the design. For example, the basic sleeve can be adapted to puff or bell sleeve.
6. The use of paper will enable one to make a garment with minimum amount of fabric because it is possible for the dress designer to try out the placement of pattern pieces and cut the cloth in aneconomical way.

Summary

Pattern making gives knowledge of preparing paper patterns using different individual's body measurements. They provide a scope to understand the patterns according to the requirement of the wearer. They help to understand the difficulties in fitting and then alter them according to the figure types.

Short questions:

1. Mention the types of paper patterns.
2. Write two uses of paper patterns.
3. What is drafting?
4. What is draping?
5. What is a sloper?

Long question:

1. What are the contents of paper patterns?
2. Explain in detail about types of paper patterns.
3. What are the uses of paper patterns?

UNIT-10

Body Measurements

Structure:

10.0 Introduction

10.1 Principles and rules in taking body measurements

10.2 Equipment required for taking body measurements

10.3 Direct and standard system of measurements

Learning objective:

- Taking body measurements
- Precautions to follow while taking body measurements
- Accurate and perfect method for taking body measurements

Unit preview:

In order to construct garment that fits well, body measurements must be taken with precision. Taking body measurements is a responsible task which should be undertaken with great care. For this purpose, it is important for a dress maker to have adequate knowledge about correct methods of taking and recording body measurements.

10.0 Introduction

Accurate body measurements are of vital importance for obtaining best results in clothing construction. Besides good fitting, correct measurements can also contribute towards saving time in constructing a garment. Personal measurements are required not only for stitching the garments at home or getting them stitched, but also for buying readymade garments.

Taking body measurements which should be under taken with great care for this purpose, it is important for a dress maker to have adequate knowledge

about correct methods of taking and recording body measurements, equipment required for it and other important points to be considered in taking the measurements is of great importance for garment construction.

10.1 Principles and rules in taking measurements:

1. Use a good quality measuring tape which is sturdy and will not stretch. It should not be too stiff and be pliable. The metal end of the tape is used for taking vertical measurements and the other end for taking horizontal and circumference measurements.

2. The measurements needed will depend on the type and style of garments you are making and the age and sex of the user.

3. Another person is needed to take measurements. Basic lines of the body are to be taken into consideration while measuring body parts.

4. Before body measurements are taken, a cord or tape is fastened around the waist and left until all measurements have been completed. The tape should be kept parallel to the ground while taking girth measurements like bust, waist, hip etc.

5. The accuracy of several measurements depends on this exact waistline location. Add sufficient ease to these measurements.

6. The amount of ease needed varies with the type of fabric used. More ease is needed for woven fabrics than knits.

7. A proper order and certain sequence should be followed in taking the measurements to make it more systematic.

10.2 Equipment required for measuring:

Measuring tape and L shaped rulers are the most commonly used equipment for taking body measurements. However, protractor with spirit level, Vernier caliper, ribbons and marking pencils, note book may also be required.

10.3 Direct and standard system of taking measurements:

Measurements can be taken directly on a person for whom the pattern is to be developed.

Upper bodice measurements:

1. Bust
Measure around the fullest part of the bust raising the measuring tape slightly to a level just below the shoulder blades at the back.

2. Waist
Measure snugly around the waist (where you tied the cord) keeping the tape parallel to the floor.

3.Neck
Measure around the neck, passing the tape just above the collar bone in front and along the base of the neck at the back.

4. Shoulder:

Measure from the neck joint to the arm joint along the middle of the shoulder (A to B in fig 10.1)

5. Front waist length:
Measure down from the neck at highest point of shoulder to waist line through the fullest part of the bust (A to C in fig 10.1)

6. Shoulder to bust:
Measure down from highest point of shoulder to tip of bust (A to D in fig 10.1)

7. Distance between bust points:
Measure in the horizontal direction, the distance between the two bust points (D to E in fig 10.1)

8. Back width

Measure across the back from arm hole to arm hole about 3 inches below base of neck (P to Q in fig 10.2)

9. Back waist length:
Measure from the base of neck at the centre back to waist line (R to S in fig 10.2)
10. Arm scye depth:
Measure from base of the neck at centre back to a point below it and in level with the bottom of the arm where it joins the body. (R to T in fig 10.2)
Sleeves measurements
11. Upper arm circumference: measure around the fullest part of the arm
12. Lower arm: Measure around the arm at desired level corresponding to lower edge of sleeve
13 Elbow circumferences: Measure around the arm at elbow.
14. Wrist: Measure around the wrist
15. Sleeve length: For short sleeves length, measure down from the top of shoulder at the top of arm to desired length of sleeve (B to F) in fig 10.1. For elbow length sleeve measure from top of the arm to elbow point (B to G in fig 10.1) for full length, bend the elbow slightly and measure down from top of arm to back of wrist passing the tape over the elbow point. (B to H in fig 10.1).

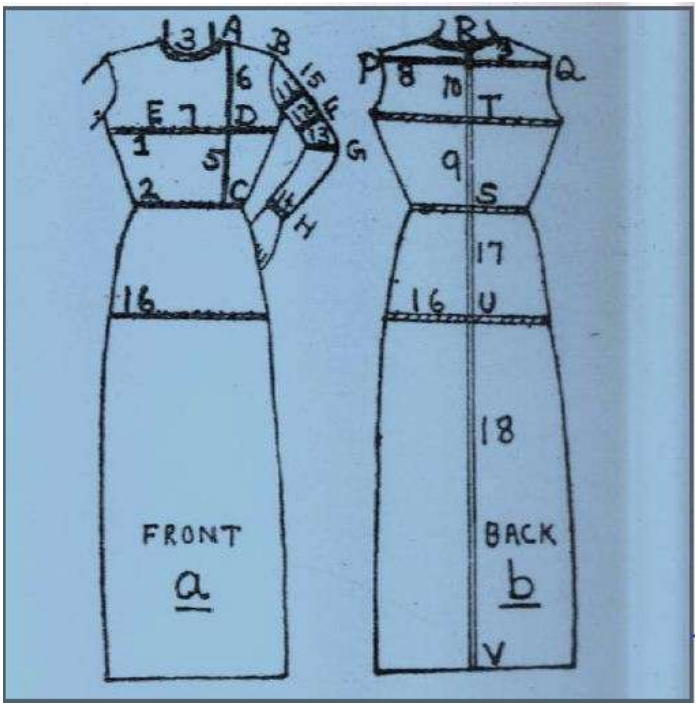


Fig 10.1 Fig 10.2

Lower body measurements:

1. Hip

Measure around the fullest part of the hip horizontally. This will be about 7 to 9 inches below the waist for an average figure.

2. Waist to hip:

Measure down from waist at centre back to fullest part of the hip (S to U in fig 10.2)

3. Skirt length

Measure down the centre back from waist to desired length of skirt (S to V in fig 10.2). Length from the waist to the floor can be taken at the same time and the difference between the two noted. The difference will give the number of inches the skirt is, above the floor level.

4. Thigh girth

Measure around the widest part of the thigh. This measurement is useful while stitching children's short pants, girl's bloomers etc. Especially if you are inserting elastic in the thigh part of the garment.

Cervical height:

Take the height vertically from the nape of the neck to the ground.

Crotch length:

Measure from the centre back waist under the crotch to the centre front waist. This measurement is useful for pants, pajamas etc.

Pant length:

Pant length is measured from waist to ankle along the side of the body.

Summary

Accurate body measurements are of vital importance for obtaining best results in clothing construction. Besides good fitting, correct measurements can also contribute towards saving time in constructing a garment. Taking body measurements is an important task which should be under taken with great

care. Measurements can be taken directly on a person for whom the pattern is to be developed or on standard dress form of intended sizes.

Short Questions:

1. List out the upper bodice measurements.
2. What are the equipment required for taking body measurements?
3. How do you record and take waist measurements?
4. What is crotch length?
5. What are the measurements required for constructing a sleeve?

Long Questions:

1. What are the principles and rules to be followed in taking body measurements?
2. How do you take upper body measurements?
3. List out the sleeve measurement and illustrate.

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FASHION & GARMENT MAKING

Paper - II

FUNDAMENTALS OF TEXTILES

INDEX

UNIT 1

TEXTILE TERMS AND DEFINITIONS

STRUCTURE:

1.0 Introduction

1.1 Terminology

Learning objectives:

After reading this unit the student will be able

1. To understand basic terms and definitions used in textiles.
2. To gain knowledge about the basic properties of textiles.

Unit preview:

The basic knowledge of textile terms to understand the subject textiles. Textiles and clothing are considered as the basic needs of human being.

1.0 INTRODUCTION:

The study of textiles has become tremendously popular with the present-day society. Textiles have a great impact on the psyche of the individual and the realization that it is an excellent medium to express one's creative talents has made this subject extremely relevant to everyday living.

The word textiles mean 'texture is to weave'. The word textiles refer to any product made from fibers.

Fibers are the fundamental units or the building blocks used in making textile yarns and fabrics. A fiber is defined as any product capable of being woven or otherwise made into fabric.

1.1 TERMINOLOGY:

a. Fiber:

A small hair like structure is called fiber.

b. Yarn:

Many fibers are joined together to make a yarn.

c. Filament:

Long fibers or strands of continuous and indefinite length are called filaments.

d. Staple:

These fibers are short and measured in inches or centimeters. The length ranges from 3/4 of an inch to 18 inches.

e. Count: Thread or Fabric count

Number of warp yarns and weft or filling yarns in one square inch is termed as Thread count. Warp yarns are referred to as ends and fillings as picks.

f.Denier:

A unit of yarn number, yarn count is the relation of length of a yarn with its weight.

g.Elasticity:

It is the ability of a stretched material to return immediately to its original size is called elasticity. Fibers which have good elasticity provide comfort in clothing.

h.Hydrophilic:

Fibers that are able to absorb water easily are termed as hydrophilic. Hydrophilic means "water loving".

i. Hydrophobic:

Fibers that have difficulty in absorbing water are called hydrophobic.

Examples are all synthetic fibers.

j. Absorbency or moisture regain:

It is the ability of the fiber to absorb water or moisture

k. Luster:

The gloss,sheen or shine of a fiber, yarn or fabric, when light reflects on the surface.

l.Heat sensitivity:

Is the ability to conduct heat away from the body.This helps in cooling the body and making a person comfortable on a hot humid day.

m. Solubility: Ability to dissolve

It is the test used to identify the textile fibers by dissolving them in respective solutions. Each fiber has a different solvent to identify its composition.

n.Thermoplastic fiber:

Those fibers that melt or soften when heat is applied are called thermoplastic fibers.

o.Cohesiveness:

It is the ability of fibers to cling together during spinning, unless they have this property it is not possible to spin fibers into yarns.

p.Pilling:

Formation of fiber ends into small balls on the surface of the fabrics on usage is called pilling.This affects the look of the garment.

q.Abrasion resistance:

It is ability of a fiber to withstand the rubbing or abrasion. In everyday use cloths do get rubbed while folding or rubbing against other fabrics etc.Abrasion resistance adds to fabric durability.

r. Resistance to Sunlight: It is ability to withstand the radiation from direct sunlight.

s. Flexibility:

Fiber should have ability to bend easily otherwise they cannot be folded or used for different purposes.

t.Moth resistance:

This is the resistance of the fiber from being eaten by insects and moths.

Short questions:

1. What is a filament fiber?

2.What is a staple fiber?

3.What is pilling?

4.What is meant by elasticity?

5.Differentiate hydrophilic and hydrophobic fibers

6.What is a thermoplastic fiber?

7.What is solubility?

8.What is meant by flexibility?

9.Define thread count.

10.What is a denier?

UNIT2

CLASSIFICATION OF TEXTILE FIBERS

STRUCTURE:

LEARNING OBJECTIVES:

After studying this unit, the student will be able to,

- Know the availability of fibers for textiles purposes
- To understand the different types of classification based on source and length.
- Gain knowledge about different fibers and their uses

UNIT PREVIEW:

Fibers are the fundamental units for making the textiles yarns and fabrics. The fibers are classified based on their source and length. The end uses of the fibers differ based on their nature and composition. The detailed classification is given in this unit.

2.0 INTRODUCTION

As described in the previous chapter, fibers are the fundamental units of textile yarn and fabrics. Fibers are not only obtained from nature and can also be made by man. The textile industry uses many fibers as its raw materials. Many new fibers are flooding the market day by day, based on the requirements and various end uses. These new fibers can be classified into different groups for ease of identification.

2.1 CLASSIFICATION OF FIBERS:

The fibers are classified according to the source and length seen in figure no 2.1.

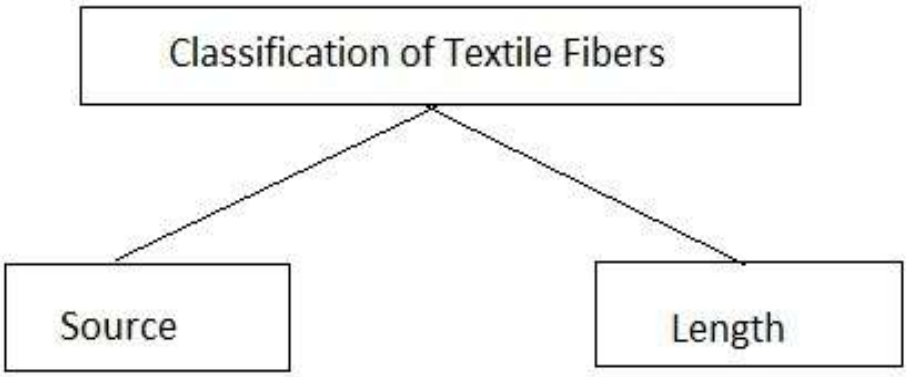


fig 2.1 classification of fibers

Classification of fibers by source:

According to the source from which they are obtained, fibers are broadly classified in to natural and manmade. Each of these categories are further divided as follows

Natural fibers:

1.Vegetable or Cellulosic fibers:

Fibers obtained from vegetable sources i.e. plants are called as vegetable fibers. Their chief constituent is CELLULOSE. They are further divided as seed fiber, bast fiber (taken from the stalk of the plant), leaf fiber and nut husk fiber. The examples for this type is shown in figure2.2. This category also includes minor fibers such as, jute, pineapple, etc.

2.Animal fibers or Protein fibers:

There are several animal fibers obtained from different sources, but only two are recognized as major fibers. They are Wool and Silk. Wool is obtained from sheep. It is a hair grown on the sheep. Silk is called as extruded fiber or secretion fiber obtained from the secretions of silkworm which form into yarn upon solidification. Silk is the only natural fiber available in filament form. Other minor hair fibers in this category are Mohair, Cashmere, Angora and Camel hair.

3.Mineral fibers:

Asbestos is the only natural mineral fiber obtained from varieties of rock.

Manmade fiber:

These refer to those fibers that are not naturally present in nature but are synthesized.

1.Cellulosic source:

Fibers are made from natural cellulose which is obtained from wood pulp. These are called Regenerated fibers. These fibers are made from naturally occurring material cellulose and are made into filaments. Example: Rayons and Acetate.

2. Protein fibers:

These are from the protein source but not very popular in present days.

Examples are maize, corn, soya bean.

3.Mineral fiber:

These fibers are glass, steel and carbon. Glass is used for low cost reinforcement in plastic, for ships, cars and thermal and electrical insulation and steel is used to reinforce rubber in tyres and belts for filters where chemical resistance is important.

Carbon fibers are used for aircrafts parts, tennis and squash rackets, etc.

Synthetic fibers:

Synthetic mean long filament fiber made from petrochemicals. The properties and application of these fibers are based on the chemical composition and arrangement of molecules in the fiber.

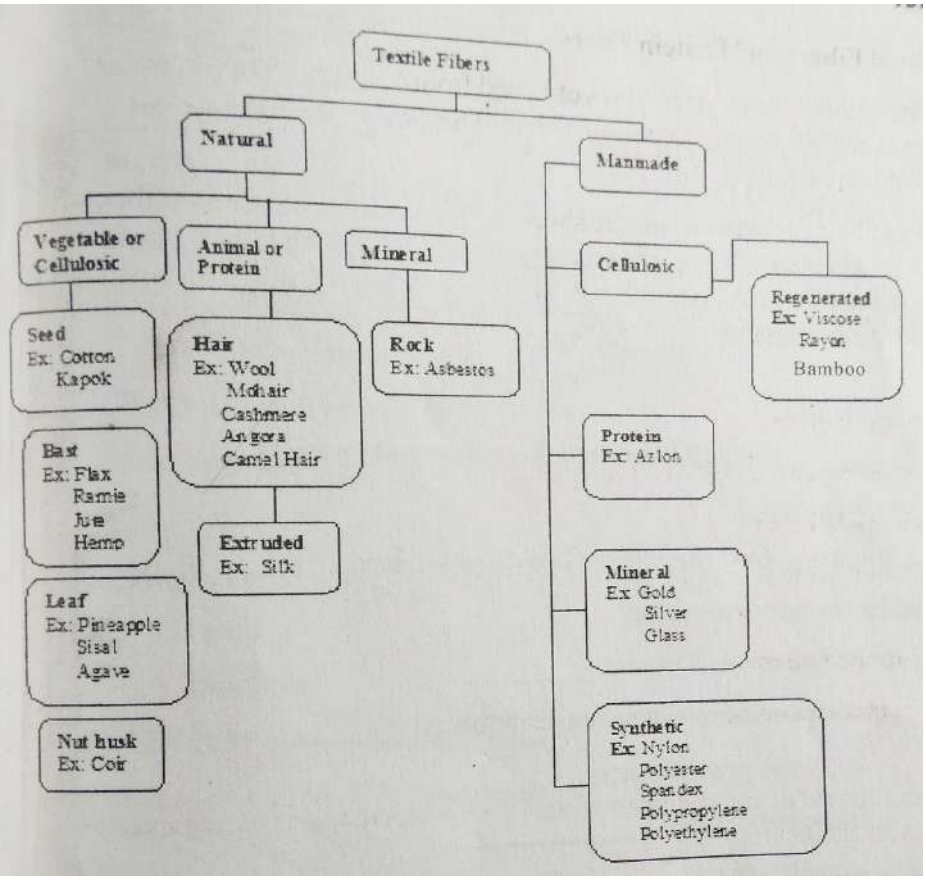


fig 2.2 classification of fibers by source

2.2 CLASSIFICATION OF FIBERS BY LENGTH

According to length fibers are classified into two types staple or spun and filament shown in figure2.3.

1.Staple or Short or Spun fibers:

These fibers are either natural or manmade but are short in length. Fibers which measure in inches or fraction of an inch e.g.3/4 to 18 inches. Except Silk all others natural fibers are staple fibers. Manmade fibers though are made in filament form, they are purposefully cut into short staple lengths for the purpose of making them look like cotton.

2.Filament fibers:

Long fibers measured in yards or meters are known as filaments. Silk and all manmade fibers are filaments in nature.

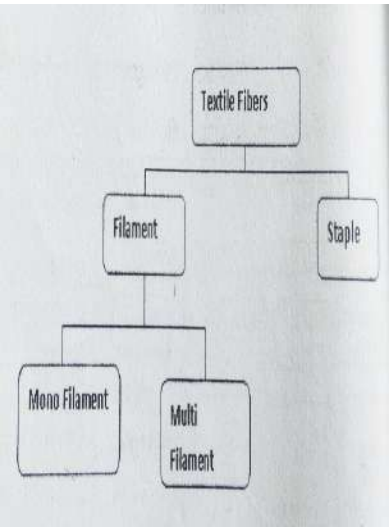


fig 2.3 classification of fibers by length

Short answer type questions:

1. Give examples for protein fibers.

2.List out natural fibers.

3.Mention about manmade fibers.

4.How are vegetable fibers are classified?

5.Give examples for animal fibers.

Long answer type questions:

1. Write in detail about classification of textile fibers. Classify textile fibers according to source.

2.Discuss about staple and filament fibers based on length.

UNIT 3

3.1 COTTON

STRUCTURE

LEARNING OBJECTIVES

- To understand the importance of cotton and its history.
- To study about the cotton manufacturing process
- To identify and learn about cotton and its properties.
- To know about the different finishes given to cotton and uses of cotton

UNIT PREVIEW

Cotton is a universal fiber used for different purposes. It is considered as the principal crop in our country. Cotton fibers grow in warm climatic conditions. This unit deals with the manufacturing process and properties i.e. physical, chemical and biological. Different types of finishes are given to cotton fabric that enhance the quality and utilization.

3.1.0 INTRODUCTION

Cotton is obtained from plant source and it is classified as natural, cellulosic, seed, and staple fiber measuring 10-65mm in length and white or beige in colour. Cotton grows from the surface of the seeds in pods, or bolls, of a bushy mallow plant hence it is called as seed hair. It is composed basically of a substance called cellulose, on burning cotton smells like a burning paper and leaves a gray fluffy ash.

3.1.1 HISTORY OF COTTON

Cotton has been cultivated for more than 5000 years. Cotton industry marked by the industrial revolution, which marked the invention of carding machine and the spinning mule in England and by the invention of the cotton gin in the United States.

COTTON CULTIVATION:

Cotton can be cultivated in warm places. It requires continuous warm weather for about 200 days and sufficient moisture and sunlight. Different countries follow different timings for its growth. The soil has to be enriched with manure. Weeds should be removed. After a few weeks buds appear and bloom as creamy white flowers. A color change occurs in the flowers and seedpods appear. When mature cotton pods burst, and fleecy white cotton appears.

The fibers are separated for seeds, vegetables matter and sent to spinning mills for further processing.

3.1.2 PROCESSING AND MANUFACTURING OF COTTON

Handmade cotton:

The tools and appliances used by the cotton weavers consist of spinning wheel(charka) spindle(takli) and a bow shaped beater(dhun). The threads then formed are wound on a bamboo reel and from which warp of the handloom is set to weave the fabric

MANUFACTURING PROCESS OF COTTON

1. PREPATRATION: The fibers are first removed from the seeds, leaf-fragments, dirt and other materials. The seeds are removed by ginning process.

2.FORMING THE LAPS: Fibers are made into a soft roll or lap. Several laps are combined into one.

3.CARDING: The fibers are drawn together to form a loose rope or sliver.

4.DOUBLING: Slivers are combined

5.COMBING: It is the continuous and refinement of the carding process. Combing is separation of short and long fibers and make the long fibers lie in parallel lines.

6. DRAWING: In drawing process the silvers are pulled so that, the length can be increased and diameter gets reduced. The slivers are given the first twist and wound onto bobbins.

7.ROVING: The bobbins are placed on the roving frame where further drawing and twisting take place until the cotton sliver is about a pencil lead in diameter.

8.SPINNING: Done on the spinning frame where the sliver passes through sets of high speed rollers and gives the yarn of desired thickness and twist.

9.WEAVING AND DYEING: A variety of weaves can be used for cotton. Dyes are applied to raw cotton at fiber, yarn or fabric stage.

10.FINISHING: Both performance and functional finishes are given to cotton.

3.1.3 PROPERTIES OF COTTON:

PHYSICAL PROPERTIES:

1.STRENGTH: Cotton is relatively strong fiber

2.ELASTICITY: Cotton is relatively inelastic that is why cotton fiber gets wrinkles and creases easily.

3.MOISTURE REGAIN: Cotton is very absorbent. it has a good moisture regain.

4. ELETRICAL PROPERTY: The hygroscopic nature ordinally prevents cotton materials from developing static electricity.

5.THERMAL CONDUCTIVITY: Cotton has high degree of thermal conductivity.

6.ABSORBENCY: Cotton is a good absorbent fiber

7.DRAPABILITY: Cotton does have a good drapability.

8.RESILIENCE: Cotton wrinkles easily.

CLEANLINESS AND WASHABILITY: Due to the rough nature it can be washed easily in hot water and strong soaps without causing damage to the fibers.

LUSTER: Cotton has no luster, but this can be provided by the mercerization.

SHRINKAGE: Cotton shrinks when wet. This can be overcome by pre-shrinking treatment.

EFFECT OF HEAT: Cotton can withstand moderate to higher temperature in ironing.

So, it is better to iron in damp conditions.

CHEMICAL PROPERTIES: Concentrated and dilute mineral acids like

sulphuric acid will destroy cotton fiber.

EFFECT OF ALKALIES: Cottons are resistant to alkalis.

EFFECT OF BLEACHES: These have no effect unless, in higher concentration and when heated.

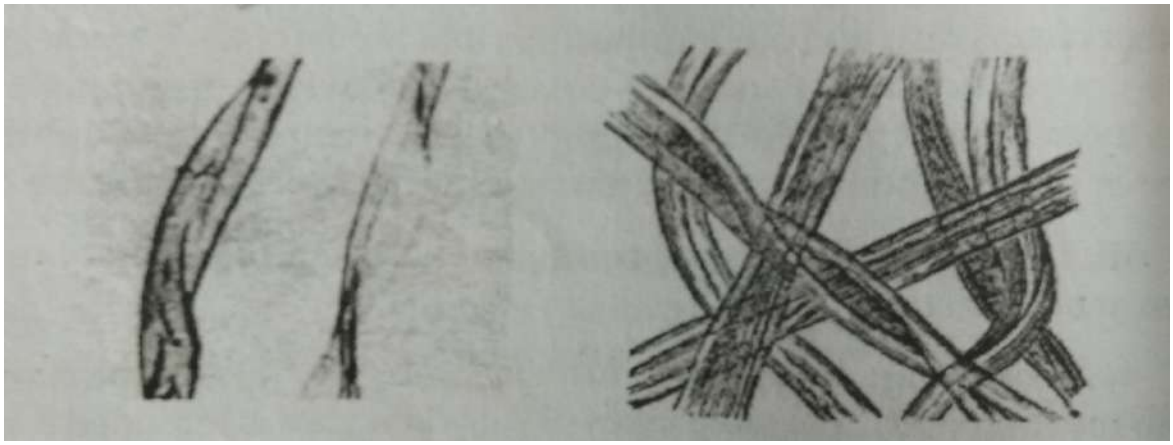
EFFECT OF SUNLIGHT AND WHEATHER: Ultra violet rays of sunlight effect the strength of the fiber if exposed for a long time, it changes the colour to yellow.

EFFECT OF PRESPIRATION: Acid perspiration discolours the fiber.

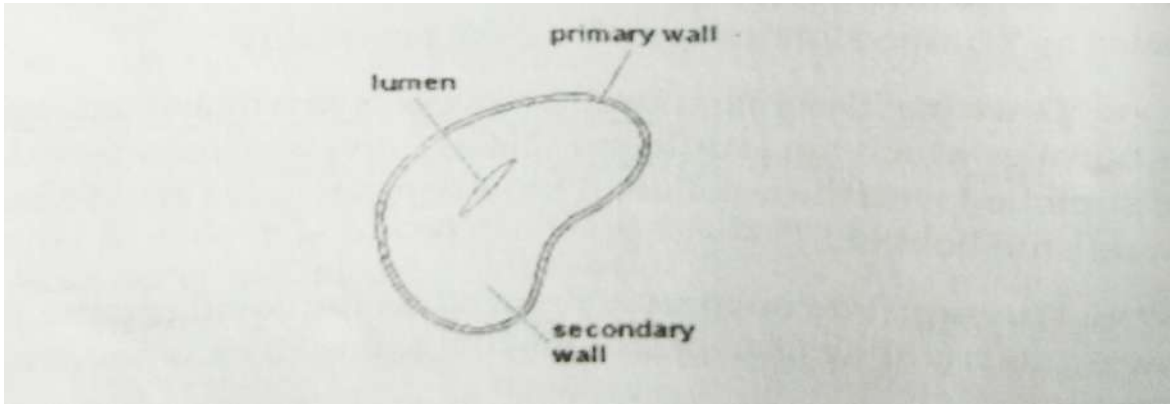
AFFINITY TO DYES: Cotton generally has good affinity to dyes like vat reactive, azoic dyes, direct, developed.

BIOLOGICAL PROPERTIES: Cotton is damaged by the mildew and bacteria. Moths and carpet beetles will not damage cotton but the silver fish eat the cellulose.

MICROSCOPIC APPEARANCE: Longitudinally, it is like a twisted ribbon or twisted tube with convolutions.



Longitudinal View



Cross sectional view

3.1.4 FINISHES FOR COTTON:

Regular finishes like singeing, mercerization, sizing, calendering and special finish like crease resistant, anti-bacterial finishes mildew and rot treatment are common.

COTTON AND ITS BLENDS: Cotton is blended with many fibers like cotton and wool, cotton and linen, cotton and silk, cotton and viscose, cotton and nylon, cotton and polyester.

3.1.5 USES OF COTTON:

Cotton is used for making variety of clothes, home furnishings, towels, pillow cases, curtains, upholstery, medical supplies, women and men's wear and baby clothes are frequently made of cotton.

SHORT ANSWER TYPE QUESTIONS:

1.Why is cotton called King of textile fibers?

2.What is handmade cotton?

3.Write the uses of cotton.

4.What are the biological properties of cotton?

5. What is the microscopic appearance of cotton?

LONG ANSWER TYPE QUESTIONS:

1.Discuss about manufacturing process of cotton.

2.Write in detail about physical and chemical properties of cotton.

3.Write about history and cultivation of cotton.

3.2 JUTE

Structure:

3.2.0 Introduction
3.2.1 History of Jute
3.2.2 Manufacturing of Jute
3.2.3 Properties of Jute
3.2.4 Uses of Jute

Learning Objectives To get:

1. Acquainted with history of fibre.
2. Understand about manufacturing process.
3. Properties of jute fiber.
4. Study of different uses.

Introduction:

Jute is most used vegetable fibre exceeded only by cotton. The fiber has been used in India as material for making handicrafts and packaging material.

History of Jute:

This is often called Calcutta Hemp. Jute is obtained from a plant corchorus capsularis. Brazil is also making successful attempt to grow jute. Jute grows from 05 to 10 feet high. This is a cylindrical stalk as thick as man's finger. The individual bast cells of the jute are very fine much shorter than flax fibres. It is yellow in colours.

Cultivation of jute:

To grow jute, farmers scatter the seeds on cultivated soil. When the plants are about 15–20 cm tall, they are thinned out. About four months after planting, harvesting begins. The plants are usually harvested after they flower. Before the flowers become seeds, the stalks are cut off close to the ground. The stalks are tied into bundles and soaked in water for about 20 days. This process softens the tissues and breaks the hard pectin bond between the bast and Jute (inner woody fibre) and the process permits the fibres to be separated. The fibres are then stripped from the stalks in long strands and washed in clear, running water.

Then they are hung up or spread on thatched roofs to dry. After 2–3 days of drying, the fibres are tied into bundles. The suitable climate for growing jute is a warm and wet climate, which is offered by the monsoon climate during the fall season, immediately followed by summer. Temperatures ranging from 70–100 °F and relative humidity of 70%–90% are favourable for successful cultivation. Jute requires 2–3 inches of rainfall weekly with extra, needed during the sowing period.

Manufacturing process of jute:

The plant grows to 10 feet height and with flowers.

Retting:

It is removing the fibers from the jute plant by steeping the stems in streams or ponds or pools for bacterial action so that the fibres get separated from stems. Over retting should be avoided as it causes damage to the fibres and becomes difficult to handle by the spinner.

Softening:

Jute is basically very harsh fibre so, water and oil are added to the fibers to soften the fibers.

Preparing the yarn:

The fibers are sent to the carding machine and made into round slivers. Many slivers are joined into one. It is then delivered to the roving frame and gives slight twist and wound on bobbins and then prepared for weaving.

Properties of Jute:

Jute fiber length is 05 to 12 feet, colour is white and off white, yellow, brown. The strength of the fiber is moderate jute is 100% bio-degradable. Jute fibres are strong, coarse and environment friendly.

Uses of Jute:

Jute is used to make cloth for wrapping bales of raw cotton and make bags and sacks. The fibres are also used to make curtains chair covering, carpets, rugs.

Short answer questions:

1. What is the other name for jute?
2. What is the height jute plant?
3. What is the colour of jute?
4. How do you soften jute?
5. Write the uses of jute.

Long answer questions:

1.Write in detail about manufacturing process of jute.
2.Discuss about properties of jute.

3.3 LINEN

Structure

Learning Objectives:

- To understand the history of linen.
- To know about production of linen.
- To learn properties of linen and its uses.

Unit preview:

Linen is known as flax and is obtained from a plant known as 'LINUM USITATISSIMUM'. Linen is the term applied to the yarn, spun from flax fibres and to the cloth or fabric woven from this yarn. Flax fibres are held together under the stem's bark by a gummy substance called pectin. It is a natural, cellulosic, bast, multicellular fibre.

Introduction:

Linen is a natural vegetable fiber obtained from slender stalks of linen plant. Linen is otherwise called flax. These are cellulosic in nature. It is considered as the finest and purest fiber because of its desirable qualities.

History of Linen:

Linen cloth was produced and used from antiquity. The flax was used in 4000 and 6000B.C in middle east countries. Historical records show that linen must have been the first textile fibre to be used. In Egypt, the mummies used to be covered with linen. In some countries, linen was used only for ceremonial purposes. Since it is embedded in the stalk or stem of flax plant and not exposed to atmosphere and does not contain dirt and impurities, it is called as pure linen.

Manufacturing process of Linen:

Flow chart of Linen

1.Cultivation

2.Harvesting

3.Preparation of fibre

4.Rippling

5.Retting

6.Breaking

7.Scutching

8.Hackling

9.Spinning

Cultivation:

Linen plant requires deep, rich, levelled soil with cool, damp climate. Linen can be grown in a specified area of the soil, once in 7 years' time. The seeds are sown by hand. Weeds must be removed by hand. In 3 months the plants become straight and slender with tapering leaves, and small blue, purple or white flowers appear. Blue flower yields finer fiber.

Harvesting:

The stalks of linen turn from green to brown, indicating maturity. The plants must be pulled and made into bundles. These bundles are called beets.

Preparation of the Fiber:

1. Rippling: The stocks are passed through combs to remove seeds and leaves.
2. Retting: The separation of fibres from the stalks is called retting. The gummy substance which holds the fibers to the stem are decomposed by steeping in water. Different countries follow different methods of retting.
3. Breaking: When the stalks are dry they are passed through iron rollers which have holes. This process reduces the size of the stalk to small pieces of bark called shives.
4. Scutching: The Scutching machine removes the broken shives by means of wooden paddles to release the flax fiber.
5.Hackling(combing): This process, separates short fibres from long ones and keeping long ones in parallel lines.

6. Spinning: The short linen fibers which are called tow, are used for inferior quality yarns. The long fibres which are called line or dressed flax are used for superior quality fabrics. Twist is added at this stage.

Properties of Linen:

1. Physical properties:

a. Shape: The flax fibre is thick regular fibre with subdued lustre. The length of the fiber varies from a few inches to 22 inches. The average length after processing is 10-15 inches.

b. Lustre: The lustre of this fiber is medium to high.

c. Strength: It is a very strong fibre. It is stronger when wet than dry.

d. Elastic recovery: Linen has no significant elasticity.

e. Elongation: Linen has low elongation.

f. Resiliency: The resiliency of this fibre is very poor.

g. Absorbency: Linen is a very absorbent fiber. It takes up water quickly and releases very rapidly.

2.Chemical properties:

a. Resistance to acids: Linen is damaged by hot dilute acids and cold concentrated acids but not by cold dilute acids.

b. Resistance to alkalis: It is highly resistant to alkalis.

c. Sunlight: Tends to get weaken by direct sunlight.

Uses of linen:

Linen is used for clothing and upholstery, bed linen, table linen and children's dresses.

Short answer questions:

1. What is the other name for linen?
2. What is hackling?
3. What is retting?
4. What is tow?
5. What is scutching?

Long answer questions:

1. Explain in detail about manufacturing process of linen.
2. Discuss about properties of linen.
3. Write in detail about types of retting.

3.4 SILK

Structure

Learning Objectives

- To have comprehensive knowledge about silk fiber, history and varieties.
- To get acquainted with silk worm rearing practices.
- To learn about the processing of silk fiber.
- To understand the properties in relation to end uses.
- To have an insight about the different blends of silk.

3.4.1 Introduction

Silk is the very fine strand of fibre that is a solidified protein secretion produced by caterpillars to encase themselves in the form of cocoons. Silk is a natural continuous filament fibre, with luster and smoothness with uniform length throughout the filament.

3.4.2 History of Silk

Silk is known as the 'Queen of Fibers' because of its smoothness and luster and considered as a luxury fiber and as a pure fiber. Silk was first discovered in china in 2600 B.C., when a cocoon fell into the cup of tea that a Chinese

princess was drinking while sitting under a mulberry tree. The hot liquid softened and loosened the fiber, which the princess pulled and drew away from the cocoon as a continuous strand. Another story cites Empress Si-Ling-Chi as the first producer of silk fiber, from which she made a silk robe for her husband. From antiquity until the more recent establishment of the Chinese Republic, she was considered as the Goddess of the Silkworm. Later Caravans introduced the silk in East and Alexander the Great carried this to Europe in fourth century B.C. After three thousand years of its origin the secret was stolen out of China. From then onwards silk became the pure prized fiber available naturally in most countries.

3.4.3 Silk Producing Countries

Japan ranks first to produce silk in large quantities. It uses scientific means in production. Other silk producing countries are China, India, Italy, Spain, Bulgaria, Turkey, Greece, Syria and Brazil. Constant supervision is required throughout the cultivation of silk.

Types of Silk: Silk may be classified into two main types

1. Mulberry. E.g. Bombyx mori

2. Non-mulberry or wild silk. E.g. Tassar silk, Muga silk, and Eri Silk

3.4.4 Cultivation of Silk

Silk is obtained from the larvae of several months. These larvae feed on the leaves of mulberry plants. Raising these insects is a skilled occupation and requires countless hours of work. Sericulture is the name given to the production or rearing of the silk worms. The life cycle of the female Bombyx mori or any silkworm is as follows;

The female moth lays the eggs, which develops into the larva, or caterpillar or the silk worm.

The silkworm, which spins its cocoon for protection and to permit further developments into pupa, or chrysalis.

The Chrysalis, which emerges from the cocoon as the moth.

The moth, of which the female lays eggs, so continuing the life cycle.

Actually, the larvae spin the cocoon by moving its head in figure '8'motion to cover the body. As it spins the cocoon, larva decreases in size and changes into chrysalis. The silkworm extrudes the liquid fiber from two tiny orifices or spinneret in its head. A gummy substance called sericin (silk gum) is extruded by two holes in close proximity to form a cocoon. As the liquid emerges into to the air it becomes hardened. This is called a cocoon. The cocoons are collected and subjected to heat, to kill the chrysalis.

3.4.5 Processing of Silk Fiber

Filature operations

The cocoons that are raised by the silk farmers are delivered to a factory, called filature, where the silk is unwound from the cocoon and the strands are collected into skeins. The process includes the following steps.

(a) Sorting of Cocoons

The cocoons are sorted according to the colour, size, shape and texture as all these affect the final quality of silk. The colour of cocoons generally ranges from white or yellow to greyish, depending on the source and the type of food consumed during the worm stage.

Sorting Cocoons

(b) Softening the Sericin

After the cocoons have been sorted, they are. put through a series of hot and cold immersions, as sericin must be softened to permit the unwinding of the filament as one continuous thread. Raw silk consists of 80% fibroin (protein) and 20% sericin (gum). At this stage only 1% of the gum is removed, because, this silk gum is a needed protection during the further handling of the delicate filament.

(c) Reeling

The process of unwinding the filament from the cocoon is called as reeling. Care and skill in the reeling operations prevents defects in the raw silk. As the filament of single cocoon is too fine for commercial use, three to ten strands are usually reeled at a time to produce the desired diameter of raw silk thread. Several cocoons are placed in hot water to soften the gum and the surfaces are brushed lightly to find the ends of the filaments. These ends are collected, threaded through a guide and wound on to a wheel called a reel.

(d) Throwing

As the fibers are combined and pulled onto the reel, twist can be inserted to hold the filaments together. This is called as throwing and the resulting yarn is known as thrown silk.

(e) Spinning

Short ends of silk fibers, from the outer and inner edges of the cocoons and from broken cocoons are spun into yarns in a manner similar to that, used for cotton.

(f) Degumming

To bring out the natural luster and the smoothness of silk, some amount of sericin must be removed. This is done by dipping it in a soap solution. A small amount of sericin is still kept in order to give strength and dull finish to the final product.

Silk weighting

Silk is valued according to weight. The lighter the fabric, costlier it is. So, to reduce the cost and to improve drapability, silk is weighted with tin, aluminum and other metallic salts.

3.4.6 Types of Silk

a) Spun silk: Spun silk refers to short fibers which are used for inferior quality fabrics. There are different sources from which spun silk can be obtained.

1.Pierced cocoon: The moths break open the cocoons and come out. So, the cocoon gets broken resulting in short fibers.

2.Double cocoon: Two silkworms spin two cocoons which are combined. When they are broken, short fibers are obtained. This is called douppioni silk.

3.Floss: Before reeling, the cocoons are brushed, the short fibers which come out are called floss.

4.Frison: The coarse and uneven silk at the beginning and ending of the cocoon.

5.Scrap: The machine waste from different process like reeling, throwing is called scrap.

b. Wild silk: This is got from wild species of moth which feed on oak leaves and not on mulberry leaves.

c. Pure dye silk: Pure dye silk refers to where metallic salts are not added to increase the weight of the silk.

d. Weighted silk: The cost of silk depends on the weight. As the weight decreases the cost becomes less. So metallic salts are added to reduce cost so that it can be available to less income people also. Pure silk is one for which no weight is added.

3.4.7 Properties of Silk Fibers

In spite of its high cost, silk has been one of the most popular fabrics because of its unique properties. Soft, supple, strong and lighter in weight than any other natural fibre, silk is prized for its lightness with warmth, sheerness with strength, and delicate with resiliency. Silk is a natural protein fibre. The actual fibre protein is called fibroin while the protein sericin is the gummy substance that holds the filaments together.

Physical properties

Strength

Silk is the strongest of all-natural fibers. The continuous length of the filament yarns results in strength. However, strength of the spun silk yam depends on the length of the silk staple.

Shape and appearance

Silk filaments are very fine and long. They frequently measure about 1000 to 1300 yards in length. The width of the silk is from 9 to 11 microns.

Elasticity

It is an elastic fibre and its elasticity varies. Silk fibre may be stretched from l/7to 1/5 its original length before breaking. It returns to its original size gradually and loses little of its elasticity.

Microscopic appearance

Cultivated degummed silk viewed longitudinally under a microscope, resembles a smooth transparent rod. Silk filament has patches of sericin on the surface. Wild silk tends to be quite uneven and is somewhat dark.

Resilience

Silk retains its shape and resist wrinkling rather well. This is more in fabrics made from pure silk rather than spun silk or weighed silk.

Drapability

Silk has pliability and suppleness that, aided by its elasticity and resilience, give it excellent drapability.

Heat Conductivity

Since silk is a protein fibre it is a non-conductor of heat like wool, hence it is used for winter apparel.

Absorbency

The good absorptive property of silk also contributes to its comfort in warmer atmosphere and in dyeing and printing.

Cleanliness and Washability

Silk is a hygienic fiber because of its smooth surface does not attract dirt. It can also be easily cleaned using mild soaps or dry-cleaning.

Reaction to Bleach

Strong bleaches containing sodium hypochlorite will deteriorate silk. Mild bleaches like sodium perborate and hydrogen peroxide may be used with extra care.

Shrinkage

Silk has normal shrinkage which can be easily restored by ironing at moderate heat and damp conditions.

Effect of Heat

While ironing care should be taken to see that iron is not very hot.

Effect of Light

Continuous exposure to light weakens silk faster than either cotton or wool.

Resistance to Mildew

Silk will not be affected by mildew unless left for some time in damp state or under the extreme conditions of tropical dampness.

Resistance to Insects

In blends of wool and silk the beetles and larvae of moths may damage silk.

Reaction to Alkalies

Silk is not as sensitive as wool is to alkalies. It may be affected in higher concentrations and high temperatures. Cold dilute solutions of alkali such as soda or caustic potash have slight action on silk. Heated solution dissolves silk.

Reaction to Acids

Concentrated mineral acids dissolve silk faster than wool. Organic acids do not harm silk. Medium concentrated HCL will dissolve silk.

Affinity for dyes

Silk has very good affinity to acid dyes, but their light fastness is unsatisfactory.

Resistance to Perspiration

Silk fabrics are damaged by perspiration. Silk itself deteriorates and the colour is affected, causing staining.

Silk blends

Silk and cotton, silk and polyester, silk and linen, silk and wool are popular.

Finishes given to silk

Degumming, weighting calendaring (for body and luster), embossing, singeing, water repellence and stiffening are finishes given to silk.

Silk mark

There are numerous other textile materials sold in the name of silk i.e. Art silk, Artificial silk and other glamorous names. Silk mark is a certification mark in India for silk textiles. The mark certifies that the piece of textiles which bears the mark is made of pure natural silk. Only an authorized user of Silk Mark can use the label on his products. Giving an assurance of pure silk, the label protects and promotes silk. Silk Mark is helpful to identify pure silk.

3.4.8 Uses of Silk

Silk is used primarily in apparel and home furnishing items because of its appearance and luster. Silk is extremely versatile and can be used to create a variety of fabrics from sheers, gossamer chiffons to heavy, beautiful brocades and velvets. Because of silk's absorbency, it is appropriate for warm -weather also. Because of its low heat conductivity, it is used for cold-weather. In furnishings, silk is often blended with other fibers to add a soft luster to the furnishing fabric. Silk blends are often used in window - treatment and upholstery fabrics. Occasionally, beautiful and expensive handmade rugs will be made of silk.

Summary

Silk as an animal fibre, is the product of two distinct varieties of silkworms Wild & cultivated. Wild silk, often called tussar silk are dull in luster and has rough uneven yarns. From cultivated silkworms fine, even, long fibre can be obtained. Spun silk yarns are made from silk waste. Silk is the Queen of the textile fibers because of its luster and smoothness. The cost of silk can be regulated by blending with other fibers.

SHORT ANSWER TYPE QUESTIONS:

1.List out the types of silk.
2. What is a cocoon?
3. What are the uses of silk?
4. Write about microscopic appearance of silk.
5. Name the protein present in silk fiber.

LONG ANSWER TYPE QUESTIONS:

1. Write about cultivation of silk.
2.Explain in detail about manufacturing process of silk.
3. Discuss about physical and chemical properties of silk.s

3.5 WOOL

Structure

Learning Objectives

- To be acquainted with history and classification of wool fiber.
- To understand about the wool manufacturing process.
- To know about properties of wool fiber.
- To study the different finishes given to wool fiber and their uses.

Unit Preview

The unit deals with the history and classification of wool. Wool fiber is an animal fiber, used as winter clothing. Wool fiber is manufactured in different steps. The microscopic appearance shows the internal structure of the fiber. The physical, chemical, biological properties and end uses are discussed in this unit.

3.5.1 Introduction

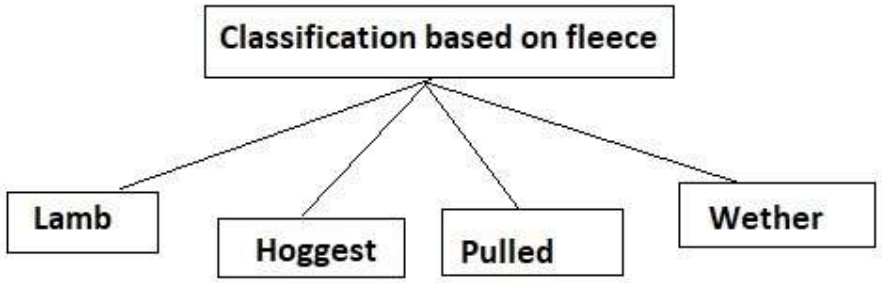
Wool was the one of first fibers to be converted into fabric, by matting. Wool fibre grows from the skin of sheep as hair. It is composed of a protein known as keratin. It has crimp and has scales on its surface. The natural protein fibre consists of amino acids. The number of scales and amount of crimp depend on the breed of the sheep.

3.5.2 History of Wool

Originally, wool was borne on wild species of sheep as a short, fluffy undercoat concealed by hair. When primitive people killed wild sheep for food, they used the pelts as body coverings. The fluffy undercoat probably became

matted by usage, thus giving early man the idea of felting into a crude cloth. In first century AD. it was discovered that Merino sheep could be bred to improve the fleece, as the wool of wild sheep is coarse. The breeding of the animals and the production of the wool fibre into fabric are more costly processes consequently wool fabrics are more expensive. The interlocking of woollen fibers is known as felting.

3.5.3 Classification of wool



Classification of Wool

Classification of wool by sheep:

Wool fibers quality depends on the amount of crimp and number of scales per inch as these two contribute warmth and spinning qualities.

Class 1 or Merino wool:

Merino sheep produces the best wool. The staple is relatively short, strong, fine and elastic. The amount of crimp is highest and has maximum number of scales per inch around three thousand scales per inch. Merino wool is used for best type of wool clothing. This class of sheep originated in Spain.

Class 2: This class of sheep is originated from England, Scotland, Ireland. These are 2-8 inches in length and have large number of scales per inch and good crimp.

Class 3: This class of sheep is originated in the United Kingdom. The fibers are about 4-18 inches in length and have less number of scales and less crimp. They are smooth and have luster which are not necessary for wool fibers.

Class 4: This type of wool is obtained from hybrid varieties. The fibers are 1-16 inches in length have less scales per inch and less crimp. Used for cheap quality woollens fabrics.

Classification by fleece

Sheep's are shorn of their fleeces in spring depending on the age of the animal.

Lamb's wool: The first fleece sheared from a lamb about six to eight months old is known as lamb's wool. Fine in quality and soft texture.

Hogget wool: 12 to 14 months old that has not been previously shorn and has all the qualities which desirables.

Pulled wool: When sheep is slaughtered for meat their wool is pulled and is used.

Cotty wool: Very poor grade wool

Wether wool: Any fleece clipped after the first shearing is called wether wool.

Wool Mark

Wool Producing Countries

Cold weather produces a hardier and heavier fibre. Excessive moisture dries out natural grease. Insufficient or poor food retards growth. Certain countries are suitable for large-scale sheep raising and consequently produce the greatest quantities of wool. The chief wool producing countries are Australia, the U.S.S.R., New Zealand, Argentina, South Africa, Hungary, and the United State.

3.5.4 Manufacturing Processes

Shearing:

Shearing Sheep are generally shorn of their fleeces in spring, but the time of shearing differs in different parts of the world. Machine clippers remove the fleece faster, closer than the hand clippers. Superior quality, Class 1 comes from the sides and shoulders, where it grows longer, thinner, and softer, is treated as class one fleece; wool from the chest, belly, and shanks is treated as second quality fleece

Preparation

On an average about 8 pounds of fleece is obtained from one sheep. The fibers are packed in bags or bales. The raw wool or newly sheared fleece is called grease wool because it contains the natural oil of the sheep. When grease wool is washed, it loses from 20 to 80 percent of it is original weight. The grease, known as yolk, is widely used in the pharmaceutical and cosmetic industries.

Sorting and Grading

After reaching the mill, skilled workers do wool sorting. Each grade is determined by type, length, fineness, elasticity. and strength. Separating the fibre by touch and sight.

Garneting

Garneting is the second step. Recycled wool fibers are obtained by separately reducing the unused and used materials to a fibrous mass by a picking and shredding process called garneting. In this process the fibers are treated with dilute sulphuric acid or hydro chloric acid.

Scouring

Washing of raw wool in an alkaline solution is known as scouring. Wool is treated with warm water, soap. and a mild solution of soda ash or other alkali to remove the dirt in the fibers.

If raw wool is not sufficiently clear of vegetable matter and dirt, after scouring, it is put through the carbonizing bath. The fibers are then put through a dilute solution of sulfuric or hydrochloric acid, which destroys any vegetable matter. This process is known as carbonizing, and the resultant wool fibers are called extracts.

To remove the grease and dirt in the raw wool it is put through a series of naphtha baths followed by clear water to remove the naphtha. This is called as Naphthlation. It improves the dye uptake property of wool.

Drying

Since wool undergoes many wet processes it has to be dried. Wool is not allowed to become absolutely dry. Usually, about 12 to 16 percent of the moisture is left in the wool to condition it for subsequent handling.

Oiling

As wool is unmanageable after scouring, the fibre is usually treated with various oils, including animal, vegetable, and mineral, or a blend of these to keep it from becoming brittle and to lubricate it for the spinning operation.

Dyeing

If the wool is to be dyed in the raw stock, it is dyed at this stage. Some wool fabrics are piece-dyed, some are yarn or skein dyed, and some are top-dyed.

Blending

Wool of different grades or pure wool fibers and other textile fibers may be blended or mixed together at this point. All this information should be present on the labels, regarding blending and mixing.

Carding

The carding process introduces the classifications of woollen yarns and worsted yarns. It makes the fibre parallel and some amount of dirt is removed and the fibers are straightened. Fibers used for the worsted yarn are more straightened than the woollen yarns.

Gilling and Combing

The carded wool, which is to be made into worsted yarn, is put through gilling and combing operations. The gilling process removes the shorter staple and straightens the fibers. This process is continued in the combing operation, which removes the shorter fibers of l to 4-inch lengths (combing noils) places the longer fibers (tops) as parallel as possible, and further cleans the fibers by removing any remaining loose impurities.

Drawing

Drawing is an advanced operation for worsted yarns which doubles and redoubles slivers of wool fibers. The process draws, drafts, twists and winds the stock, making the slivers more compact and thinning them into slubbers.

Roving

This is the final stage before spinning. Roving is actually a light twisting operation to hold the thin slubbers intact.

Spinning

In the spinning operation, the wool roving is drawn out and twisted into yarn. Woollen yarns are chiefly spun on the mule-spinning machine. Worsted yarns are spun on any kind of spinning machine -mule, ring, cap, or flyer.

The differences between woollen and worsted yarns are as follows;

Woollen Yarn	Worsted Yarn
Short staple	Long staple
Carded only	Carded and combed
Slack twisted	Tightly twisted
Weaker	Stronger
Bulkier	Finer, smoother, even fibers
Softer	Harder

Weaving Woollen Fabrics

Basically, the woollen yarns are woven using the plain weave, or sometimes the twill. Woollens are desirable for sportswear, jackets, sweaters, skirts, blankets, and similar general use. These fabrics are generally napped to give smooth and warmth effect.

Weaving Worsted Fabrics

For worsted fabrics twill weave is mostly used. They are appropriate for tailored and dressy purposes, for spring and summer coats and suits, and for tropical suits.

Wool Products Labelling Act

The U.S. government passed the Wool Products Labelling Act in July 1941. This act, amended in 1980. Wool is variously called salvaged, reclaimed, reworked, or remanufactured, but it is best known in the textile industry as shoddy. Other definitions used for wool labelling are:

Wool: It must always mean new wool, comes directly from a fleece. It has never been previously spun, woven, felted, or worn.

Virgin wool: It is now used by the textile industry to designate new wool from a sheep's fleece but the term is too all-inclusive to serve as criteria of quality i.e., low grade or high-grade wool.

Pure wool: It is the wool fabric made of 100 % only.

Wool blend: It is the fabric containing both wool fibers and any other textile fibers.

Recycled Wool: According to the government classification recycled wool is fibre that has been reclaimed and remanufactured from used or unused wool materials. Wool fabrics: cashmere, gabardine, jersey, home spun fleece, tweed, sharks skin, mohair, serge, and suede.

WOOL MARK

3.5.5 Properties of the Wool

Strength: Wool is the weakest of all-natural fibers.

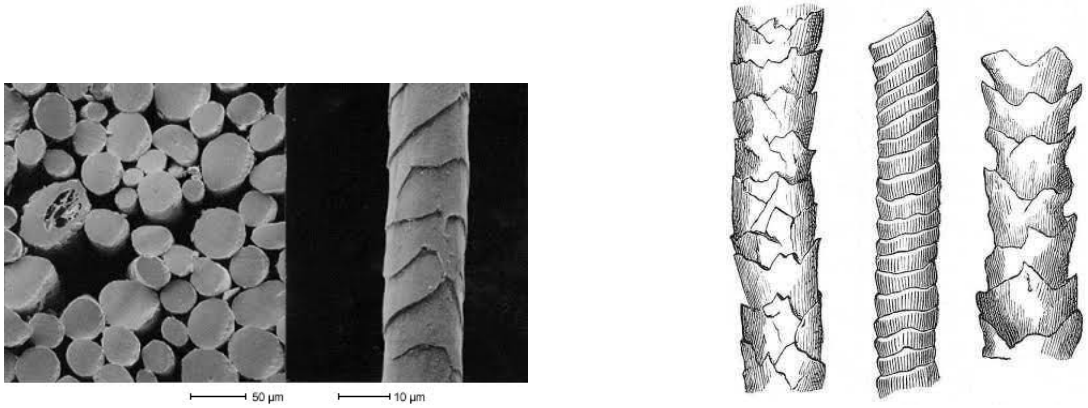
Elasticity: The fibre may be stretched to 25% to 30% of its natural length before breaking.

Resilience: Wool has high degree of resilience. Wrinkles in the fabric can be removed with steaming.

Crimp: Wool has crimp which makes it desirable as this feature improves the quality wool. Fine wool has -10 crimps per centimeter. Coarse wool -4 crimps per centimeter.

MICROSCOPIC APPERANCE OF WOOL

Under the microscope wool appears to have scales on the surface. It is uneven in diameter.



Microscopic view of wool

Drapability: It has excellent draping quality due to its pliability, elasticity, and resiliency.

Heat conductivity: Wool is a non-conductor of heat, they permit the body to retain its normal temperature and give warmth in cold weather. This is due to the presence of scales on the fibre surface.

Cleanliness and Washability: Dirt tends to adhere to wool fabric. Wool requires dry cleaning or laundering if the fabric is washable. Since wool loses 25% of its strength when wet it should not be pulled. They should be lifted and squeezed. Wash the wool in cool water and dry on a flat surface.

Reaction to Bleach: Hydrogen peroxide and sodium perborate are safe while sodium hypochlorite or other chlorine bleaches are harmful.

Shrinkage: Shrinkage is greater in woolens than worsteds, but all fabrics made of wool are subjected to shrink. So it can be given treatments like Fulling, decating or decatizing and London Shrinking.

Effect of Heat: Wool becomes harsh at 212°F (100°C) and begins to decompose at slightly higher temperatures. It will scorch at 400°F and will char.

Effect of Light: Wool is weakened by prolonged exposure to sunlight.

Resistance to Mildew: Wool is not ordinarily susceptible to mildew; but if left in damp conditions, mildew develops.

Resistance to Insects: Wool fabrics are especially vulnerable to the larvae of moths and such other insects as carpet beetles. They should be protected from these harming insects.

Reaction to Alkalies: Wool is quickly damaged by the strong alkalies. It is imperative to use a mild soap or detergent when laundering wool fabrics.

Reaction to Acids: Although wool is damaged by hot sulfuric acid and other dilute acids have less effect.

Affinity to Dyes: Wool has high affinity for dyes. Use of chrome dyes is best.

Resistance to Perspiration: Wool is weakened by alkali perspiration. Perspiration generally causes discoloration.

Finishes given to wool: Felting, fulling, mothproofing, crabbing, decanting, London shrinking, napping, singeing and steaming.

Wool blends: Wool polyester, wool acrylic, wool nylon, silk and wool.

3.5.6 Uses of Wool

The majority of wool (72.8 percent) is used in apparel. Home furnishings account for 15.4 percent, industrial uses 6.7 percent, and exports 5 percent.. The most important use of wool is for adult apparel such as coats, jackets, suits,

dresses, skirts, and slacks made from woven fabrics of varying weights; and suits, dresses, skirts, and sweaters made from knitted fabrics.

In home-furnishing area the major use of wool is in carpets and rugs where wool gives the more cover to the carpets and warmth in the rugs. Blends of different synthetic fibers with wool for suiting materials are increasingly important. They result in fabrics that are more appropriate in colder conditions. Polyester is mostly used in blending with wool.

Summary

A consumer who selects a wool fabric should be willing to pay for its quality, if that is the major factor governing the decision. A good quality wool is not cheap and prices are tending to rise. A good grade of reprocessed wool, however is sometimes superior to poor grade of new wool. Blends of wool with man-made and natural fibers have grown in importance. The consumer should read the percentage of each fibre and any washing instructions on the label before purchasing.

SHORT ANSWER TYPE QUESTIONS:

1. Mention about the types of wool.
2. What is meant by crimp?
3. Write the uses of wool.
4. What is the microscopic appearance of wool?

LONG ANSWER TYPE QUESTIONS:

1. Write about manufacturing process of wool.
2. What are the physical and chemical properties of wool?
3. Explain the classifications of wool with suitable examples.

UNIT 4

4.1 POLYESTER

Structure

4.1.1 Introduction

4.1.2 History of polyester

4.1.3 Methods of manufacture

4.1.4 Types of polyester Yarn

4.1.5 Evaluating polyester Fabrics

4.1.6 Uses of polyester

Learning Objectives

- To understand the history of polyester fiber
- To gain knowledge about the production process of polyester
- To know about the properties and end uses of polyester fiber

Unit Preview

Petroleum by-products are used to produce polyester fiber. It is a common synthetic fiber widely used in different applications. This fiber is mostly blended with other fibers. The manufacturing methods differs based on its end uses. This unit describes the physical and chemical properties and its use as apparel, home furnishing and for industrial purposes.

4.1.1 Introduction

Polyester fibers are long-chain polymers produced from elements derived from coal, air, water, and petroleum. As defined by the FTC, these fibers are chemically composed of at least 85 percent by weight of an ester of a dihydric alcohol and terpathalic acid. Polyester is one of the most commonly used synthetic fibers. It has good strength. It is thermoplastic in nature. It melts in flame, and forms a grey hard non-crushable bead. It is also an easy-care fabric and can be made into wash and wear fabrics.

6.2 History of Polyesters

The groundwork for the development of polyester fibers was laid by Dr. W. H, Carothers in his experiments with giant molecular structures. The work resulted in the development of a polyester fibre known as ***Terylene.*** otherwise called Dacron.

The Polyester fibers produced are PET AND PCDT. PET (polyethylene terephthalate) and PCDT (poly-1,4-cyclohexylene-dimethylene terephthalate).

4.1.3 Methods of Manufacture:

Generally, each company produces only one variety of polyester, though there are likely modifications under specific trademarks. It is interesting to note that the same polyester used to produce a PET fibre is also made in thin, transparent film form for making a coating for metallic fibers.

PET Polyester

The principal raw material is ethylene obtained from Petroleum. The process of manufacturing of PET polyester fiber starts with petroleum products. From petroleum, ethylene is obtained. Ethylene is oxidized to produce a glycol monomer dihydric alcohol. This is combined with another monomer terephthalic acid. Both monomers are placed in an autoclave which controls temperature and pressure. Polymerization takes place in the autoclave and the molten polyester is collected. The molten polyester sent on to a casting wheel to form s ribbons. These polyester ribbons are sent to a chipper and the chips are again converted to a molten state. The molten polyester is extruded through the spinnert to form polyester yarns. Dyes and delusterents are added prior to extrusion from the spinneret.

PCDT Polyester

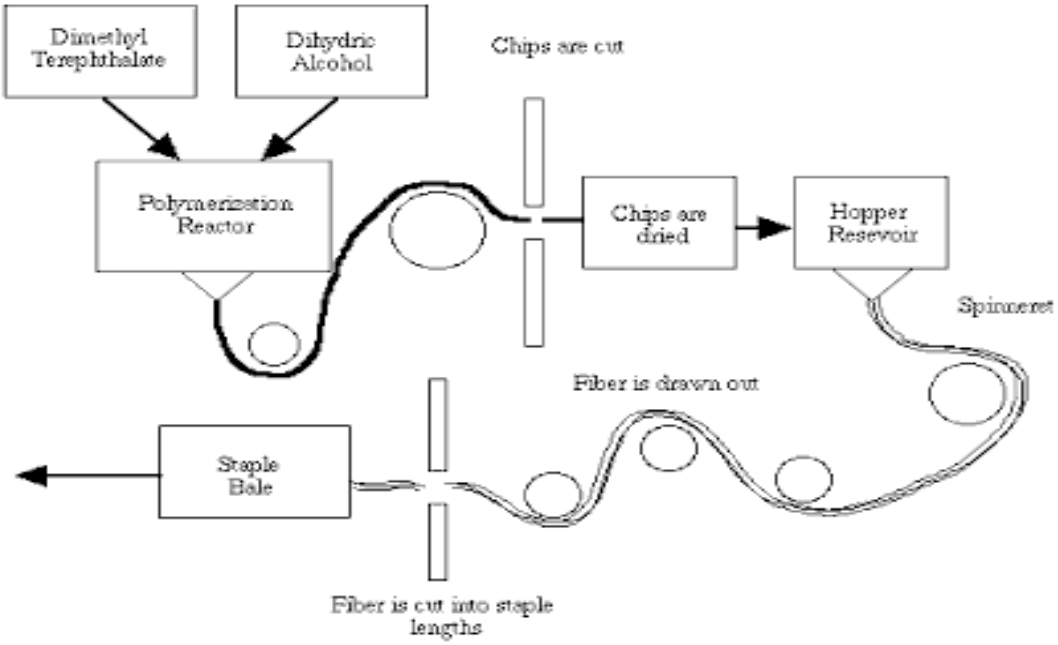
The original PCDT polyester fibre is Kodel, which is now designated as Kodel 200 series. This form of polyester is made by condensing terephthalic acid with 1, 4-cyclohexane-dimethanol to form the tongue twister, poly-l,4-cyclohexylene-dimethylene terephthalate; hence, the convenient abbreviation PCDT polyester. Like PET polyester, PCDT is processed by melt spinning.

Spinning the Fibre

The molten polymer is rigorously maintained in an airtight condition, as oxygen will affect its stability. The viscous melt is extruded through a spinneret,

and the filaments are subsequently drawn into the desired polyester fibre. Variations in the production process depend upon the desired end uses.

The holes of the spinneret may be round or modified are to be trifocal, pentagonal, hexagonal, or octagonal shapes to do achieve specific effects, such as greater insulative properties. Other properties may be obtained with the aid of specific additives to the spinning solution.



Upon extrusion from the spinneret, the polyester filament does not have all the desired characteristics because of the random arrangement of the super polymer molecules. The fibers are therefore drawn, or elongated, with the aid of godet wheels. The temperature conditions and the extent to which the fibers are drawn depend upon the properties desired. Polyester fibers are usually drawn to 5 times their original length (which results in a fibre diameter that 1/5 one-fifth the original size upon extrusion from the spinneret).

4.1.4 Types of Polyester Yarn

The diameter of the polyester yarn is determined by

- The rate of extrusion of the filaments from the spinneret,
- The number of spinneret holes,

- The rate of drawing of the filaments. The yarns come in a wide range of diameters and staple lengths.

The yarns are produced, basically as monofilament, multifilament, and spun and sometimes as textured yarns.

4.1.5 Evaluating Polyester Fabrics

The two major forms of polyester (PET and PCDT) have certain differences between them These differences are principally mechanical attributes rather than chemical. Hence, some of the properties are general, others are specific.

Physical properties

Shape and appearance

These fibers are generally round and uniform. The fibre is partially transparent and white to slightly off white in colour.

Strength

As a group, polyester fibers may be characterized as relatively strong, fibers. PET polyesters are, in general stronger than the PCDT Kodel 200 series polyesters. Hence polyester is found in the industrial uses and highly durable fabrics.

Elasticity

Polyester fibers do not have a high degree of elasticity. although PCDT polyester is more elastic than PET polyester. In general, polyester fibre is characterized as having a high degree of stretch resistance, which means that polyester fabrics are not likely to stretch out of shape too easily.

Resilience

Polyester fibre has high degree resilience. PCDT polyester is resilient than PET polyester. Not only does a Polyester fabric resist wrinkling when dry, it also resists wrinkling when wet.

Drapability

Fabrics of polyester filament have satisfactory draping quality. Polyester can produce spun yarns that are flexible and softer, thereby increasing the draping quality.

Heat Conductivity

Fabrics of polyester filament are better conductors of heat. Polyester staple which are crimped and this does provide greater insulation in the yarns and fabrics. One of the reasons for the apparent greater warmth of polyester is its low absorbency. However, polyester crimped fibre fill or hollow staple variants can provide better insulative properties.

Absorbency

Polyester is one of the least absorbent fibers. This low absorbency has important advantages that-they will dry quickly, suited for water-repellent purposes, such as rainwear, and will not stain easily.

Fabrics of low absorbency generally have the disadvantage of being clammy and uncomfortable in humid weather because they will not absorb perspiration or atmospheric moisture.

Dimensional stability

If polyester is properly heat set, it will not shrink nor stretch when subjected to boiling water, boiling cleaning solvents or ironing temperatures that are lower than heat setting temperatures.

Shrinkage

Polyester fabrics shrink as much as 20% during wet-finishing operations and they are generally heat-set in later treatments. Consequently, finished polyester woven and knitted fabrics will not shrink. They have excellent dimensional stability

Cleanliness and Washability

Since polyester fibers generally are smooth and have a very low absorbency, many stains lie on the surface and can easily be washed by hand or machine. However, oil stains are more stubborn and under certain circumstances cannot be entirely removed. When ironing polyester fabrics, it best to use low to medium temperature.

Chemical properties

Reaction to Alkalis

At room temperature, polyester has good resistance to weak alkalis and fair resistance to strong alkalis. It reduces with the increase in the temperature and the concentration of the alkalis.

Reaction to Acids

Depending upon the type, polyester has excellent-to-good resistance to mineral and organic acids. Highly concentrated solutions of a mineral acid, such as sulphuric acid, at relatively high temperatures will result in degradation

Effect of Bleaches

Fabrics of polyester may be safely bleached because polyester has good resistance to deterioration to household bleaches. If the polyester has an optical brightener, no bleaching is necessary.

Effect of Heat

Depending upon type it will get tacky at 44OF (227-242°C). Therefore, during ironing, it should be done at lower temperatures.

Effect of Light

Polyester has good resistance to degradation by sunlight. Fabrics of polyester are therefore well suited for outdoor use. Over a prolonged period of exposure to direct sunlight, however, there will be a gradual deterioration of the polyester fibre.

Resistance to Mildew

Polyester fabrics are absolutely resistant to mildew. If it is formed is due to the finishes given.

Resistance to Insects

Polyester is unaffected by moths, carpet beetles, silverfish, or other insects.

Affinity for Dyes

Polyesters can be dyed with appropriate disperse, azoic, and developed dyes at high temperatures, producing a good range of shades and colourfastness. Solvent dispersion-dye also has good colour fastness.

Resistance to Perspiration

Polyester has no significant loss of strength from continued contact with either acid or alkaline perspiration.

Burning test and flammability

The polyester is like nylon withdraws from flame before ignition so they do not burn. They melt and dip and the flame is carried down with the dip. A black bead forms when the melt hardens.

Polyester blends

Polyester cotton blend, polyester wool blend, polyester rayon, polyester silk blend polyester triacetate blend, polyester and nylon are some of the common blends.

4.1.6 Uses of Polyester

The most important use of polyester is in woven fabrics. Frequently, spun yarns blended with cotton. Most of the woven fabrics are l polyester/cotton blends made into durable-press fabrics. 65% polyester 35% cotton blends, 50% polyester 50% cotton are most commonly seen blends in the women's wear. These blended fabrics are attractive, durable, and comfortable (except in very hot and humid conditions), retain their i appearance well, and are easy care. The first use of staple polyester was in tropical suiting for men's summer suits. The suits were light in weight and machine washable. Woven fabrics are very important not only in apparel but also in home-furnishing uses-Polyester and polyester blends are widely used in sheets, blankets, bedspreads, curtains that match bedspreads, mattress ticking, and tablecloths. They are being used more in upholstery fabrics. Polyester accounts for about 7 percent of carpets that are produced. When they were introduced, polyester carpets had a softer hand than most nylon carpets. The second important use of polyester is in knitted fabrics slightly more filament yarns than spun yarns are used. Polyester as well as polyester/ cotton blend yarns are used.

The third important use of polyester is in a specialized area is fiberfill, used in pillows, comforters, bedspreads, quilted household and apparel fabrics, and winter jackets. Polyester has captured a major share (85 percent) of the market.

Non-woven fabrics are the fourth important use of polyester. Sewn in interfacings, fusible interfacings, pillow covers, and mattress inter-linings are examples of uses for non-woven polyester fabrics.

Polyester is chosen for many other consumer and industrial uses such as pile fabrics, tents, ropes, cording, fishing line, cover stock for disposable

diapers, garden hoses, sails, seat belts, filters, fabrics used in road building, seed and fertilizer bags; artificial arteries, veins, and hearts; and sewing threads (polyester /cotton core-spun thread, 100% spun polyester thread). Research is being done to increase the ways in which polyester is used industrially. Polyester has taken a large share of the new tyre market away from nylon because polyester tyres do not "flat spot" like nylon tyres do.

Summary

Consumers are more aware of the fibre content of polyester and its blends. The man-made fibers with non-cellulosic base like polyester have the following desirable qualities (unless the structure of the fibre is modified)

1. Dimensional stability
2. Strength and durability
3. Ease of care
4. Wrinkle resistance
5. Comfort and fit (elasticity)
6. Resistance to moths and mildew.

SHORT ANSWER TYPE QUESTIONS:

1. What is PET polyester?
2. List out the types of polyester yarns
3. List out the blends of the polyester
4. What is a monofilament?
5. What is spun polyester?

LONG ANSWER TYPE QUESTIONS:

1. Explain about uses of polyester.
2. Write about physical properties of polyester.
3. Discuss about chemical properties of polyester.

4.2 NYLON

Structure:

4.2.0 Introduction

4.2.1 Source of nylon

4.2.2 Types of nylon

4.2.3 Manufacture of nylon

4.2.4 Properties of nylon

4.2.5 Uses of nylon

Learning objective:

After studying this unit, the student will be able

- to know about nylon fiber and its history.
- to understand the method of manufacture
- to learn properties and uses.

4.2.0 Introduction:

Nylon is a generic word used to denote a group of chemical compounds classified as polyamides. It is a textile just like cotton, wool, silk, polyester etc. it is thermoplastic fiber.

4.2.1 Source of nylon:

Nylon is the first synthetic fiber and it is polyamide fiber. A polymer is a large molecule made of several small molecules linked to one another in a chain or in crisscross form. Nylon is made from coal, water, air and it is composed of carbon, oxygen, hydrogen and nitrogen.

4.2.2 Types of nylon filaments:

There are three types of nylon filaments:

1. monofilament

2.multifilament

3. staple nylon fiber

Monofilament:

It is a single filament and solid strand of great length. The yarns of 7,12,15 deniers are more often manufactured. These monofilament yarns are used for hosiery and for industrial filters. These yarns have no twist.

Multifilament:

The yarn is made up of number of individual strands twisted together to make one multifilament fiber. The number of strands vary depending on the amount of twist. These are used in making of upholstery, blouses, suits, bathing suits. These fibers are soft and smooth and easy to drape.

Staple nylon fiber:

It is a very short fiber 1.5 inches to 5 inches. It has a crimpy nature which gives springiness to yarn. The fabrics made of this are light, soft, smooth to touch.

4.2.3 Manufacturing process of nylon:

1. Two chemicals called hexamethylene diamine and adipic acid are combined to get nylon salt.

2. Nylon salt is heated in an autoclave which is like a giant pressure cooker. Heat and pressure cause the molecules of two chemicals to join together to form linear polymers.

3. The molten nylon is pumped through tiny holes of a spinnerets.

4. The yarn is stretched or cold drawn between a system of rollers, then a change takes place, fiber diameter is reduced. When the fiber is cold drawn it becomes very strong, tough, elastic, translucent and lustrous filaments.

5. Nylon staple is made by crimpling continuous nylon filaments and then cutting them into short uniform lengths and packed into bales.

4.2.4 Properties of nylon:

1.Physical properties:

a. Strength:

It is light weight fiber, but it has unusual high strength.

b. Durability:

It is very tough, pliable fiber which can withstand of any extreme rubbing, scraping, bending and twisting without breaking the yarn.

c. Effect of heat:

At high temperature, nylon fabric loses its strength and becomes yellowish. Therefore, hot iron should be avoided.

d. Effect of moisture:

Nylon fabrics absorb moisture very less because of which they are easily dried after washing.

e. Effect of acids and alkalies:

All nylons have poor resistance to acids and good resistance to alkalies.

f. Effect of bleaches: Strong bleaches damage nylon fabrics.

g. Effect of moth and mildew:

Normally it is resistant to moth and mildew but may be damaged by crickets and Roches.

4.2.5 Uses of nylon:

Nylon is used for sarees, blouses, bed linen, hosiery and bathing suits and upholstery.

Summary:

Nylon is a polyamide fiber. This is the first synthetic fiber manufactured, by combining two chemical compounds. This is one of the strongest fibers which are used for both apparel and industrial uses.

Short answer type questions:

1.Name the first synthetic fiber.

2.Mention the types of nylon fiber

3.What is the composition of nylon?

4.What is a multi-filament nylon fiber?

5.Name the chemicals which are used for preparation of nylon fiber.

Long answer type questions:

1. Discuss about general properties of nylon

2. Write in detail about chemical properties of nylon fiber.

3. Explain the manufacturing process of nylon

4.3 RAYON

Structure

Learning Objectives

- To get familiar with manmade fibers.
- To learn rayon manufacturing process.
- To understand the properties and uses.

Unit Preview

The regenerated manmade fiber rayon is made out from wood pulp or cotton linters by treating with different chemicals. The fiber properties are similar to cotton because of its cellulosic nature. It is used as silk substitute sometimes because of its luster. The properties, finishes, end uses are described in this unit.

4.3.1 Introduction

Rayon fibre was the first manmade fibre composed of pure cellulose. Rayon fibers are made from cellulose that has been reformed or regenerated. Consequently, these fibers are identified as regenerated cellulosic fibers. Because of its luster and soft hand feel, it resembles silk and came to be known as artificial silk. However, it is more like cotton in its chemical composition hence gives the paper burning smell while being burnt.

4.3.2 History of Rayon

Robert Hooke, an English naturalist, had prophesied the production of a fibre such as rayon, the first of the manmade fibers, around 1664. He believed that it was possible to make an "artificial glutinous composition, much resembling, silk. In 1884, Count Hilaire de Chardonnet produced the first manmade textile fibers from nitrocellulose. He became known as the "Father of rayon".

In 1890, L.H. Despaisses of France developed the cuprammonium process for making rayon, which had some properties that were superior to those of nitrocellulose rayon. Manmade textile filaments were officially recognized so, in 1925, when the Federal Trade Commission (FTC) permitted the use of the name "rayon" for yarns obtained from cellulose or its derivatives.

There were basically two groups of rayons one consisting of regenerated pure cellulose (viscose rayon), the other of a cellulose compound (acetate rayon). In the chemist's terminology, rayon and acetate are not synthetic because natural materials such as cotton linters and wood pulp are used in their manufacture, rather than chemical compounds.

4.3.3 Basic method of producing rayon

The natural process by which the silkworm transforms the protein of mulberry trees into two fine filaments is simulated in the process of making rayon. A liquid substance of cellulose is forced through a metal cap or nozzle about the size of a thimble. This nozzle is called a ***Spinneret,*** because it performs the same function as the silkworm's spinneret. The cap is usually made of a platinum-rhodium alloy because acids or alkalis do not affect that metal. It is perforated with small holes that are almost invisible to the naked eye. Through each of the tiny holes, a filament is extruded, which is solidified by a liquid bath as it comes from the spinneret. The number of holes in the spinneret ranges from 1 to 20,000, and filaments of equal size are simultaneously produced. In a subsequent operation, twisting is introduced.

4.3.4 Types of rayon

There are now two principal methods of making rayon. The fibers differ in important characteristics because the methods differ. These rayons - viscose and high wet-modulus are classified as regenerated rayon because the original raw material (cellulose) is changed chemically into another form, which is then changed (regenerated) into cellulose again. These changes produce the final product, purified cellulose in fibre form.

The Viscose process

Fibre Production

Viscose rayon is made from cotton linters or wood pulp usually obtained from spruce, hemlock, and pine trees.

In the viscose process, wood chips or cotton linters are treated to produce sheets of purified cellulose that resemble white blotters. The cellulose sheets are then soaked in caustic soda producing sheets of alkali cellulose. This substance is broken up into fluffy white flakes or grains called cellulose crumbs, which are aged for two or three days under controlled temperature and humidity. Liquid carbon disulphide is then added. This turns the cellulose into cellulose xanthate, a light orange substance that is still in a crumb form. The cellulose xanthate crumbs are dissolved in a weak solution of caustic soda and transformed into a thick viscous solution called viscose, resembling, honey in colour and consistency. The viscose is aged, filtered and vacuum treated to remove air bubbles, as they would cause the filament to break. It is then forced through the holes of the spinneret into sulphuric acid, which coagulates the cellulose of the soluble cellulose xanthate to form pure regenerated cellulose filaments.

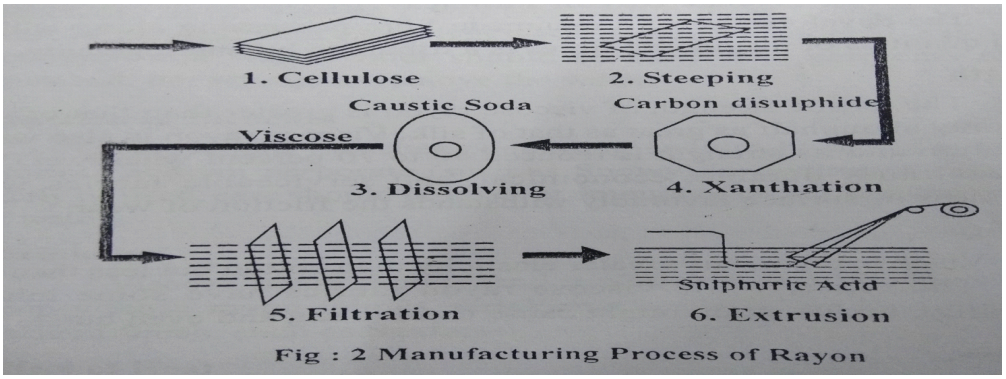


Fig : 2 Manufacturing Process of Rayon

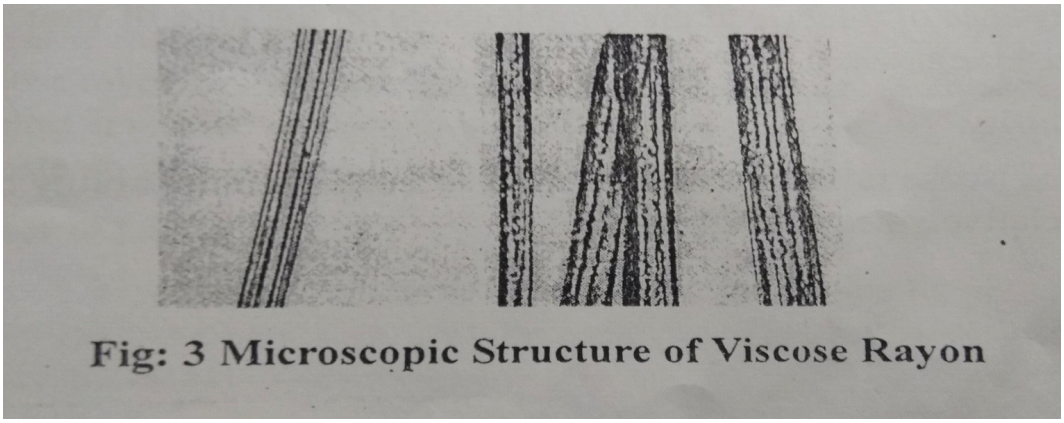


Fig: 3 Microscopic Structure of Viscose Rayon

Yarn Production

Upon extrusion from the spinneret, the viscose rayon fibers are processed by one of several methods into filament or spun staple yarns. The fibers need not to be carded, combed.

Spinning Process

The methods generally used are pot, or box, spinning, spool spinning or continuous spinning Process.

Dyeing

Viscose rayon can be dyed at the solution stage or at yarn or fabric or garment stage. Solution dyeing has good colour fatness properties.

Weaving and Knitting

All types of weaves can be used for making rayon fabrics. These yarns are also used for making hosiery fabrics.

4.3.5 Properties of rayon fabrics

The development of a manmade fibre possessing along with the prized qualities of the natural fibers is a tribute to human ingenuity.

Strength

The tensile strength of viscose rayon is greater than that of wool but is only about half as great as that of silk. Viscose rayon is also weaker than cotton and its strength is reduced 40 to 70 percent when wet. Yet it produces fairly durable, economical, and serviceable fabrics whose smoothness of surface favourably withstands the friction of wear.

Elasticity

Viscose rayon has greater elasticity than cotton but less than wool or silk. Therefore, while viscose rayon fabrics have some inherent extensibility, undue strain might cause them to sag and even burst.

Resilience

Viscose rayon lacks resilience. It should be remembered that the resistance of a fabric to creasing depends on the kind of yarn, weave, and finishing process.

Drapability

Viscose rayon possesses a marked quality of drapability because it is a relatively heavy weight fabric.

Heat Conductivity

Viscose rayon is a good conductor of heat and is therefore appropriate for summer clothing like cotton.

Absorbency

Viscose rayon is one of the most absorbent of all textiles. It is more absorbent than cotton or linen.

Cleanliness and Washability

Because of its smoothness, viscose rayon fibre helps to produce hygienic fabrics that shed dirt. Some viscose rayon fabrics wash easily; and depending on the finishing they can be dry cleaned. It needs no bleaching. Since viscose rayon temporarily loses strength when wet, it must be handled with care when washed. When laundered, a mild soap or detergent and warm water should be used. The garments should be squeezed, not wrung, to remove the water.

Reaction to Bleaches

Household bleaches containing sodium hypochlorite or sodium perborate, or hydrogen peroxide may safely be used.

Shrinkage

Viscose rayon fabrics tend to shrink more than cotton fabrics. Spun viscose rayon fabrics shrink more, which can be given a shrink resistant finish.

Effect of Heat

Since viscose rayon is a pure cellulose fibre, it will burn in much the same manner as cotton. Application of heat at 300°F (150°C) causes viscose rayon to lose strength; above 350°F, it begins to decompose. When ironing, it is wise to use either a moderately hot iron on a dampened fabric or a steam iron.

Effect of Light

Viscose rayon has generally good resistance to sunlight, though prolonged exposure of intermediate tenacity rayon results in faster deterioration and yellowing.

Resistance to Mildew

Like cotton, viscose rayon has a tendency to mildew. Such fabrics therefore, should not be allowed to remain damp for any length of time.

Resistance to Insects

Moths are not attracted to cellulose. Resistance to other insects is also similar to that of cotton. Silverfish can attack rayon.

Reaction to Alkalis

Concentrated solutions of alkalis disintegrate viscose rayon. A mild soap and lukewarm water is therefore recommended when laundering such garments.

Reaction to Acids

Being pure cellulose, the fabric is disintegrated by hot dilute and cold concentrated acids similar to that of cotton.

Affinity for Dyes

Viscose rayon fabrics absorb dyes evenly and can be dyed with a variety of dyes, such as direct, acid, chrome, and disperse. It produces fast coloured fabrics.

Resistance to Perspiration

Viscose rayon is fairly resistant to deterioration from perspiration.

4.3.6 Uses of rayon

Rayon is mostly used in woven fabrics. From 1986. more rayon was seen in apparel, in both all-rayon fabrics as well as in blends with other fibers. As it

has good drape, it is used for apparels. draperies. curtains, and other household textiles. Antique-satin drapery fabrics in a blend of rayon and acetate continue to be a classic fabric in interior decoration.

The second most important use of rayon is in non-woven fabrics, where absorbency is important. items include industrial wipes; medical supplies, including bandages; diapers; sanitary napkins; and tampons. These disposable products are biodegradable.

Summary

Of all the manmade fibers, rayon is the oldest. Even though its original creators were trying to make silk artificially, they actually discovered a new and distinct fibre more versatile than any natural one. Rayon can be made to imitate cotton, wool, silk and even linen.

SHORT ANSWER TYPE QUESTIONS:

1.Who is the father of rayon?

2. What are the general characteristics of rayon fabrics?

3.Why is rayon called regenerated cellulose?

4.How does rayon drape?

5.Name the five rayon fabrics which are available in the market.

LONG ANSWER TYPE QUESTIONS:

1.Discuss in detail about basic method of producing rayon

2.Explain in detail about properties of rayon.

4.4 GLASS FIBERS

Structure

Learning objectives

After studying this unit, a student is able to,

- To know the history and manufacturing process of glass fiber
- To earn the properties and uses of glass fiber

Introduction

Ordinary glass fiber is hard and inflexible mineral substance. It can be made into fine, translucent textile fibers that have the appearance and feel of silk.

Glass fibers are both natural and synthetic. They have very high tensile strength and very high resistance to chemicals and complete fireproof. The main drawback of glass fiber is lack of resiliency and rough texture so they are not suitable for clothing except for fireproof clothing.

History of glass fiber

The idea of making yarns and fabrics from glass is hundreds of years old. Earlier artisans were successful in making glass articles for decorative purposes. In 1839, Edward Drummond Libbey exhibited a glass dress which was spectacular but this experiment had no practical value since the fabric was too stiff to be creased, folded or draped. By 1938 sufficient progress was made to manufacture glass fibers.

Method of manufacture

There are two major methods of producing glass fiber yarns. In both processes silica sand, lime stone, soda ash and borax are placed in an electric furnace, where the temperature is about 2500^{0} F. In the electric furnace all the ingredients get mixed and converted into a molten form. This molten solution is flown into a marble forming machine. In the marble forming machine the molten glass is converted into small marbles about 5/8 of an inch or 15 mm in diameter. These marbles are subjected to visual inspection so that impurities and air bubbles can be detected. The presence of impurities and air bubbles affect the final quality of glass fibers. After thorough inspection the marbles are remelted and formed into glass fiber yarns by extruding through the spinneret.

In the second method the molten glass fibers do not pass through the marble formation process but directly converted into glass fiber yarns.

PROPERTIES OF GLASS FIBERS:

1. **Strength**: Glass fiber is the second strongest of all textile fibers. Some types are stronger than equivalent diameters of stainless steel.
2. **Elasticity**: Glass fiber is virtually in elastic so, not suitable for clothing.
3. **Resilience**: With the aid of certain finishes the resilience of glass fiber fabric can be improved.
4. **Drapability**: The fine glass fibers have excellent flexibility and pliability and can be woven into fabrics of excellent draping quality with proper finishing treatments.
5. **Heat conductivity**: Glass fiber is a good conductor of heat.
6. **Absorbency**: Glass fiber does not have absorbency.
7. **Cleanliness and Washability**: The glass fiber fabric's smoothness makes it a clean fabric. The cleaning these fabrics is simple and quick.
8. **Effect of blanches**: Glass fiber is unaffected by bleaches.
9. **Shrinkage**: Glass will not shrink because it is unaffected by water.
10. **Effect of heat**: Glass fiber is highly resistant to heat and will not burn.
11. **Effect of light**: Sunlight has not effect on glass fibber fabrics.
12. **Effect of mildew**: Glass fiber is unaffected by mildew.
13. **Resistance to insects**: Moths and other insects do not attack glass fiber.
14. **Reaction to alkalies:** Glass fiber is resistant to most alkalies.
15. **Reaction to acids:** Glass fiber is damaged only by hydrofluoric acid and phosphoric acid.
16. **Affinity for dyes:** Since glass fiber is not absorbent special techniques are used do dye glass fiber fabrics.
17. **Resistance to perspiration:** Glass fiber is unaffected by perspiration.

USES OF GLASS FIBERS:

Glass fiber is meant for electrical appliances with good chemical resistance and high durability. Glass fiber meant for chemical appliances such as filter cloth is produced only in staple fiber form. The borosilicate glass is used for thermal insulation and acoustical use.

Glass fibers are used in thermal, electrical, sound and high strength fabrics.

It is also used to reinforce various materials such as tent poles, arrows, bows, roofing panels, automobile bodies, hockey sticks, surf boards, boat hulls. Glass fiber is extensively used for making tanks and vessels.

SUMMERY:

Glass fiber is a synthetic fiber with extreme resistance to heat and acids. It is one of the strongest of all textile fibers. Lack of flexibility and pliability makes glass fiber unsuitable for clothing though it has innumerable uses in industries.

SHORT ANSWER TYPE QUESTIONS:

1.What is glass fiber?

2.List out the uses of glass fiber.

3.What is the composition of glass fiber?

4.Mention the special qualities of glass fiber.

LONG ANSWER TYPE QUESTIONS:

1.Describe manufacturing process of glass fiber.

2.Describe properties of glass fiber.

4.5 ACETATE

Structure:

4.5.1 Introduction

4.5.2 History of acetate

4.5.3 Manufacturing process of acetate fibre

4.5.4 Properties of acetate fibre

4.5.5 Uses of acetate fibre

Learning objectives:

After studying this unit, a student is able

- to know the history of acetate fiber
- to understand the acetate manufacturing process
- to learn the properties and uses of acetate

UNIT PREVIEW:

Acetates are cellulose based fibers. it is one of the oldest and cheapest of all manmade fibers. It is the second non-thermoplastic manmade fiber produced by dupont, like rayon. This is also a non-thermoplastic fiber which does not melt or scorch easily at high temperature. They are soft and absorbent which make them comfortable to wear.

1.INTRODUCTION:

The cellulose acetate fibers differ from rayon in that they are not pure cellulose products, they are chemical compounds of cellulose and have their own unique properties

2.HISTORY OF ACETATE:

Acetate was developed in England during the first world war by Henry and Camille Dreyfus as a non-flammable lacquer for the fabric used for the wings and fuselage of aircraft. A technique for spinning the substance into lustrous filament of artificial silk was developed later.

3.MANUFACTURING PROCESS OF ACETATE:

Woodchips or cotton linters are converted into pure cellulose. The cellulose is dipped in glacial acetic acid for a period of time at controlled temperature. After aging, it is thoroughly mixed with acetic anhydride. A small amount of sulphuric acid is then added as a catalyst, to facilitate the reaction producing a thick, clear liquid solution of cellulose acetate. After further aging it is mixed with water causing the cellulose acetate to precipitate as white flakes. The flakes are dried, dissolved in acetone, filtered several times to remove impurities resulting in a clear white spinning solution. This is extruded through the spinneret. Delustering agents and color maybe added to the spinning solution. The filaments are collected, to wind onto bobbins and ready for mills for weaving or knitting. Staple fibers are cut and crimped and lubricated dried and baled for shipment.

Properties of acetate fiber:

1.Acetate fibers when seen under the microscope have lengthwise striations but they are few in number. Acetate fiber has good drapability and it is more elastic than rayon. Not very strong fiber. It is easy to wash

Chemical properties:

2. Acetate is mainly composed of cellulose, burns easily and is not resistant to mildew. Concentrated solutions of alkalies disintegrate acetate. Acetate is more resistant to acids. But it will be decomposed by concentrated solutions of strong acids.

3. Acetate is a medium weight fiber with excellent drape and a luxurious hand. It has fair resiliency and fair absorbency. There is no pilling problem and very little static problem. Acetate has poor strength and also poor abrasion resistance and poor elasticity. It should be dry cleaned carefully or carefully laundered. Hot water should not be used because acetate loses its strength.

Uses of acetate:

Acetate fabrics have luxurious feel or hand like satin and taffetas. It dries very quickly. Acetate fiber specially used in swim wear and lingery. Acetate helps the fabrics to keep their shape to resist wrinkles and shrinkage. Acetate fabrics are used for under garments, women's apparel, men's wear, children's garments, baby blankets, curtains, upholstery and for industrial purposes. Fabrics of acetate have excellent drapability.

Summary:

Acetate is a cellulose based fiber. Some of its properties are similar to both cotton and rayon. Because of its luster and smoothness widely used for clothing.

Short answer type questions:

1. What is the composition of acetate fiber?
2. What is the base for the acetate fiber?
3. Does acetate fiber has good drapability?
4. List the uses of acetate.

Long answer questions:

1. Describe in detail about manufacturing process of acetate.
2. Discuss about physical and chemical properties of acetate.

UNIT 5

TYPES OF YARNS

Structure

5.1 Introduction

5.2 Types of yarns

5.3 Classification of yarns, yarn count, yarn twist.

5.4 Yarn Twist

Learning Objectives

- To understand the production process of staple and filament yarns.
- To study about the classification of yarns.
- To identify different types of novelty yarns.
- To know the uses of novelty yarns.
- To understand the meaning of yarn count and yarn twist

Unit Preview

The texture and performance of the fabric is based on the type of yarns used. The yarns are classified depending on the length of the fibers and number of fibers present in the yarn. The different counts are made by using different types of fibers based on their end uses. The novelty and texturised yarns are generally used for the ornamentation purposes and to create specific effect in fabrics.

5.1 Introduction

There are different types of yarns, each having its own characteristics. These characteristics vary according to the construction and the treatment given in the manufacture of the yarn. Yarns play a very important role in determining

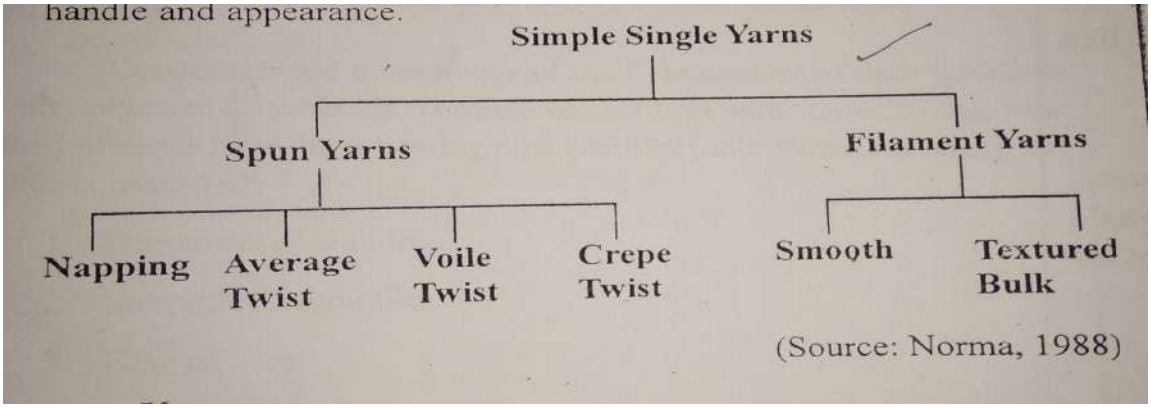
the hand and performance of the fabric. Yarn is the generic term used to denote a group of fibers twisted or laid to form a fabric.

Definition: A yarn is a continuous strand of textile fibers or filaments in a form suitable for knitting. weaving or otherwise intertwining to form a textile fabric - ASTM 1984. The process of making fibers into yarns is called spinning.

5.2 Classification of yarns

5.2.1. According to length of fibers present in the yarn

Yarns can be broadly classified as staple-spun yarns or continuous filament yarns Spun yarns consist of staple fibers assembled and bound together by twist to produce the required characteristics such as strength, hand and appearance



Spun Yarns Spun yarns are made from staple fibers that are twisted together. Spun yarns are characterized by protruding fibre ends. Spun yarn strength is dependent on the cohesiveness or the clinging power of the fibers and on the points of contact resulting from pressure of the twist. The greater the number of points of contact, the greater is the resistance to the fibre slippage within the yarn. They are suited to clothing fabric in which absorbency, bulk, warmth, or cotton like or wool like textures is desired.

Filament Yarns

The range of filament yarns is as diverse as that of spun staple yarns. The filaments yarns are divided into two types viz., flat continuous filament and textured continuous filament yarn

(a) Continuous filament yarns are produced from long continuous filaments. Filament yarns are primarily man-made, and silk is the only natural filament. Regular or conventional filament yarns are smooth and silk like, as they come

from the spinneret. Their smooth nature gives them more luster than spun yarns. (b) Textured continuous yarns are manmade continuous filament yarns that are been modified by subsequent processing to introduce crimps. spirals, loops or other or curls with high twist or low twist. It also improves the thermal and moisture absorption of filament.

5.2.2. According to the Number of parts present in yarn

Simple Yarns

A simple yarn is alike in all its parts. It can be described as spun or filament yarn based on the length of fibers. The number of parts it has also can describe a simple yarn by the direction and amount of twist. Simple yarns are classified as single, ply, and cord

(a) **A single yarn** is the product of the first twisting operation that is performed by the spinning machine.

(b) **A ply yarn** is made by a second twisting operation, which combines ' two or more singles. Each part of the yarn is called a ply. Plying tends to increase the diameter, strength and quality of the yarn. Ply yarns are commonly used in the warp direction of woven fabrics to increase the strength of the fabric. These ply yarns are used in men's shirts women's sweaters. Two ply and three-ply yarns are found in sewing threads.

(c) **A card/cable** is made by a third twisting operation, which twists ply yarns together. Some types of sewing threads and ropes belong to this group. Cords are seldom used in apparel fabric but used in industrial fabrics.

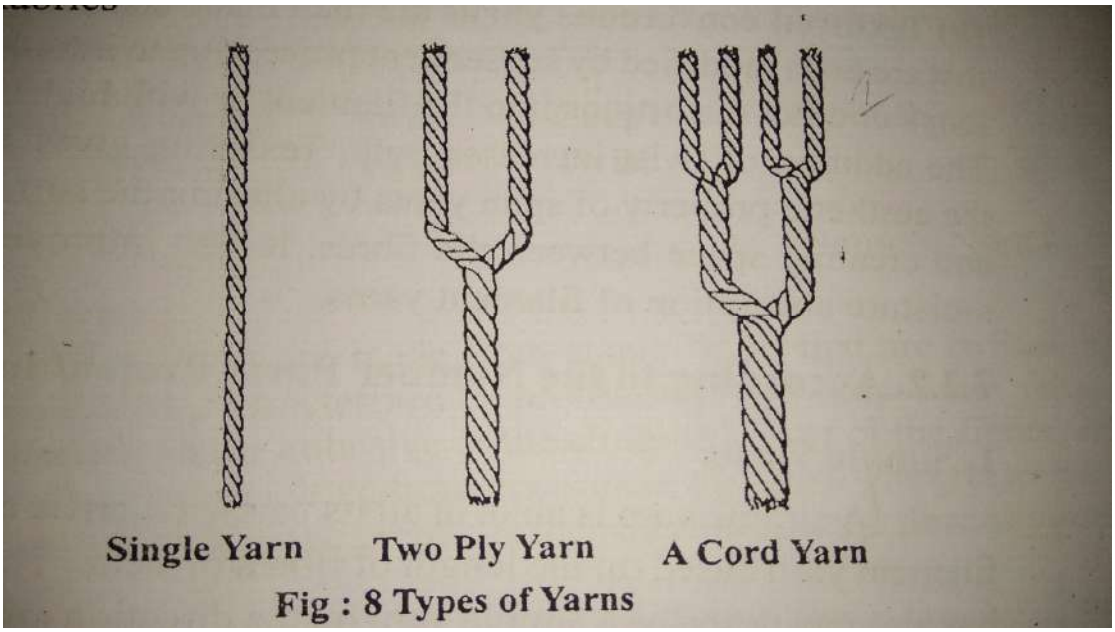
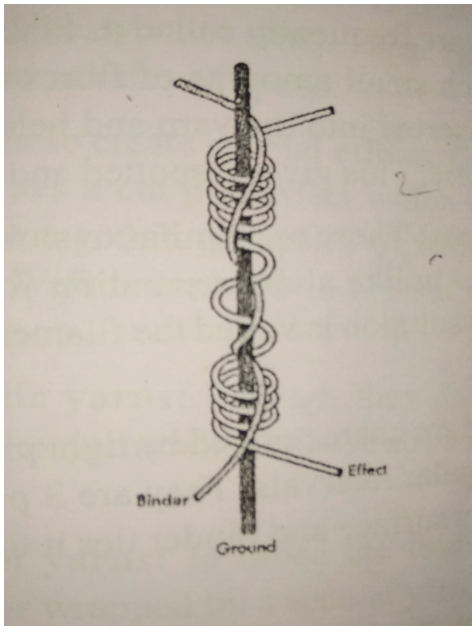


Fig : 8 Types of Yarns

Yarn and its parts:



Double Yarns

These consists of two or more single strands treated as one in weaving process, but the strands are not twisted together. These are used for ornamental effect as the low twist yarns produce luster and softness.

Novelty Yarns/ Fancy Yarns

Yarns that are irregular at regular intervals are called novelty yarns. They may be single, plied, or cord may be spun, filament, textured and combination of yarn types. Three yarns are used in making of novelty yarns (a) the ground, foundation or core (b) the fancy or effect yarns (c) the binder. Fancy yarns are more common in drapery and upholstery fabrics than apparel fabrics.

Novelty yarns are made with twisters with special attachments that allow loose, curled, twisted, or looped areas in the yarn. Novelty yarns use ply yarns. If novelty yarns are used in only one direction, they are usually in the filling direction.

Novelty yarns are usually composed of a base or ground, an effect, a tie or binder yarn. Base yarn controls length and stability of end product. Effect yarn forms the design or effect. Tie yarn holds effect yarn so that it will remain in position.

Types of Novelty Yarns

Slub yarn:

This is a thick and thin yarn made by varying the amount of twist in the yarn at regular intervals. They are found in drapery and upholstery fabrics.

Flock yarn:

These are otherwise called as Flake yarns. These are usually single yarns in which small amounts of fibers either of different colour or luster or both are inserted into the yarn and held in place by twist of base yarn. Eg., tweed fabric. This gives a spotted and short streaky appearance.

Thick and thin yarns:

These are similar to slub yarns, obtained by changing the pressure of the spinning solutions. The filaments are thick in some places and thin in some.

Boucle yarn:

These are characterized by tufts projecting from the body of the yarn at fairly regular intervals. They are 3 ply yarns. The effect yarn forms irregular wavy surface and binder, ties it to the base. It has a twisted core yam.

Loop yarns:

In loop yarns, two yarns are used. On the base yarn, the second yarn is wound at small intervals to form loops. These yarns are used for knit-ware. Yarns of different thickness are used.

Curl yarns:

These are like loop yarns but made of hard twisted and soft twisted yarns.

Gimp:

These yarns are special yarns but are stronger and thinner.

Ratine:

This is made from three yarns. There is a yarn within and in front it at intervals, loops come out, second yarn is wound round this yarn and the third binder yarn. These are similar to boucle but the loops are close in ratine and the loops are also smaller and are securely twisted. These yarns have rough surface.

Snarl yarn or spike yarn:

This is made in the same way as loop yarn using a highly twisted effect yarn, which forms snarls rather than loops.

Knop (button) yarn / Knot / Nub / Spot yarn:

In this feature, prominent bunches of one or more of the component yarns at regular or irregular intervals. This is made on a special machine that permits the base yarn to be held almost stationary, while the effect yarn is wrapped around it several times to build upon enlarged segment with brightly colored fibers added at the enlarged knot.

Seed or splash:

They resemble knops or knot yarns but the knot segment are tiny in seed yarn and elongated in splash yarn.

Cloud:

A tow-colored yarn, in which both yarns take turn to obscure or cloud the other, giving the appearance of an intermittent colour change.

Spiral or corkscrew / Eccentric:

It is made by twisting together two piles that differ in size, type, or twist. These two plies may be twisted at different speeds.

Chenille Yarn:

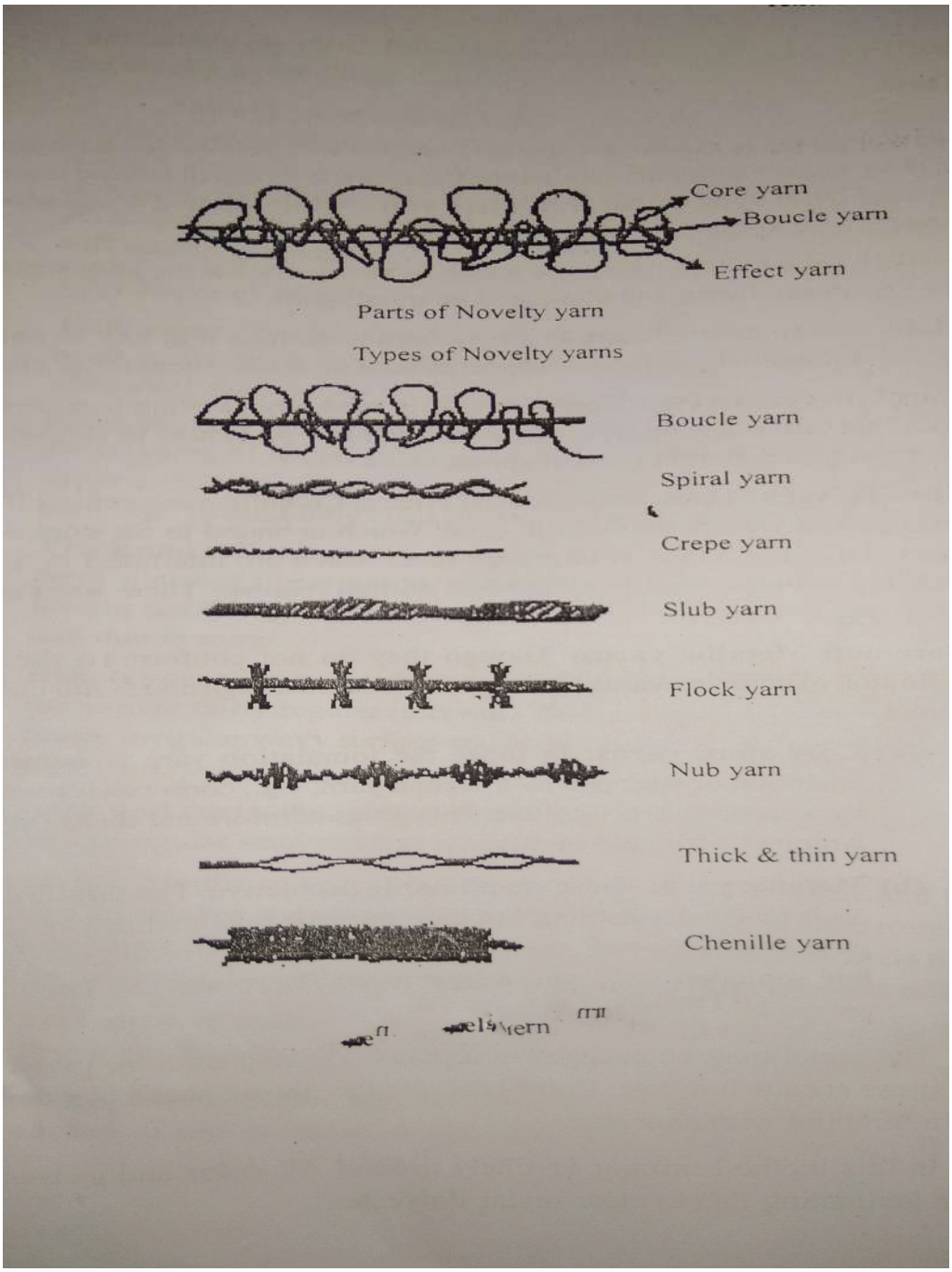
These create special effects. Chenille means caterpillar in French. The yarn has a cut pile effect which is bound to the core on the loom, warps are arranged in groups (2-6) which are interlaced in a cross-weaving manner. Weft is inserted in normal manner. These are cut in wrap way threads.

Core and Metallic yarns:

Though they do not conform to the correct definition of complex yarns but they have surface design and so are included here.

(a) Core spun yarns: In these, the foundation yarn is completely encircled or wrapped by a second yarn. E.g.: core-rubber wrapper by a second yarn of cotton. This gives comfort and durability of silk wrapped with gold or silver.

(b) Metallic yarn: These are primarily decorative. The plastic coating on it resists tarnishing, but care must be taken while pressing. Pure metals that are soft, their thin films are used over a core yarn that have replaced gold and silver now.



5.3 Effect of yarn types on fabrics:

Count:

count is a number, indicating the mass per unit length or length per unit mass of yarn.

Yarn count: Yarn count is defined as the weight per unit length of the yarn or the length per unit weight.

Yarn number varies and it differs according to the kind of fibre. Many yarns and sewing thread are numbered by the cotton system (count). Spun yarn size is referred to as number and is expressed in terms of length per unit of weight. It is spun yarn measured in indirect system, the finer the yarn, the larger the number. The count is based on the number of hanks (1 hank is 840 yards) in 1 pound of yarn. In this system the unit of weight remains constant.

Denier

For filament yarn, the yarn number is measured by direct system. Filament yarn size is dependent partly on the size of the holes in the spinneret and partly on the rate at which the solution is pumped through the spinneret and the rate at which it is withdrawn. The size of filament yarn is based on the size of the fibers in the yarn and the number of those fibers grouped into the yarn.

For filament yarns, the yarn count is expressed as denier, which is expressed in terms of weight per unit of length. If 9000 meters of yarn weigh 1 gram, it is then 1 denier. In this system, the unit of length remains constant. The finer the yarn, the smaller is the number

Denier = weight of yarn in grams / 9000 meters

1 denier 9,000 meters weigh 1 gram

Tex System

The International Organization for Standardization has adopted the Tex system, which determines yarn count or number in the same way for all fibre yarns and uses metric units (weight in grams of 1 thousand meters of yarn)

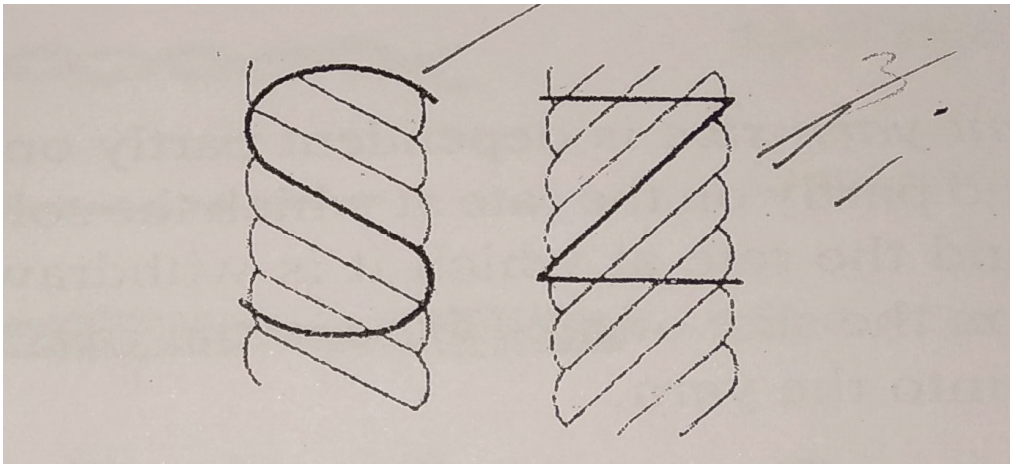
Tex = weight in grams / 1000 meters of yarn

5.4 Yarn Twist

Twist is the spiral arrangement of the fibers around the axis of the yarn. Revolving one end of a fibre strand while the other end is held stationary produces twist. Twist binds the fibers together and gives the spun yarn strength. It is a way to vary the appearance of fabrics. The number of twists is referred to as turns per inch. They have a direct bearing on the strength of the fabric.

Direction of twist

The direction of twist is described as S-twist and Z-twist, A yam has S-twist if, when held in a vertical position, the spirals conform to the direction of slope of the central portion of the letter "S," It is called Z-twist if the direction of spirals conforms to the slope of the central portion of the letter "Z," Z-twist is the standard twist used for weaving yarns. The majority of single yarns are spun with the twist in the Z direction.



S-Twist **Z-Twist**

Amount of twist

The amount of twist varies with

(1) The length of the fibers,

(2) The size of the yarn,

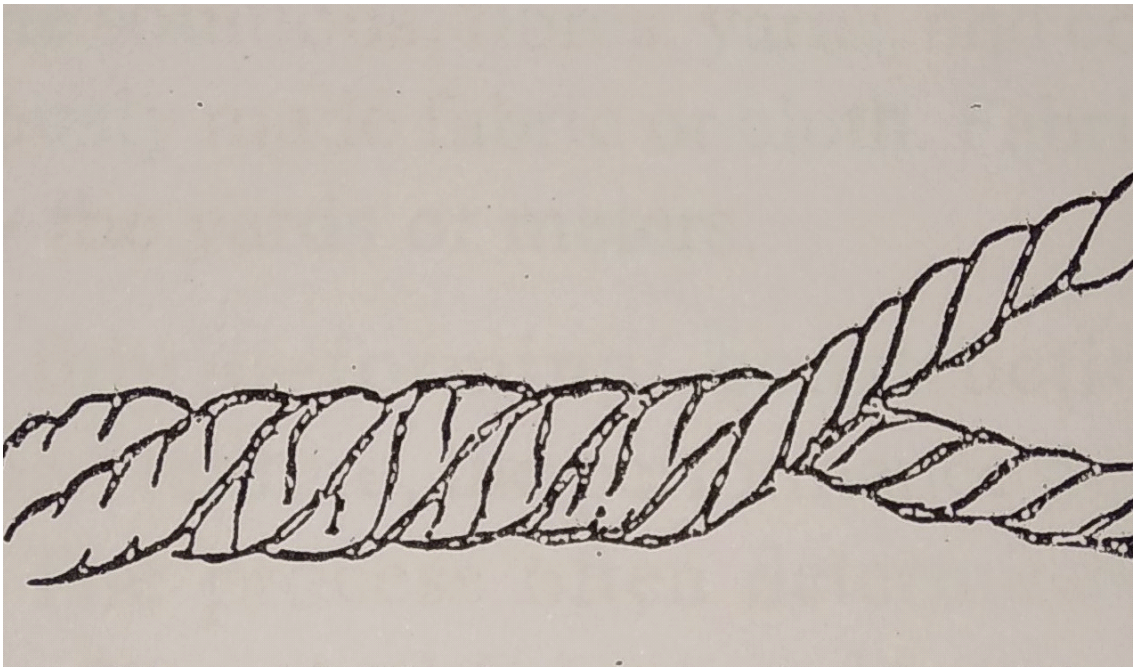
(3) The intended use.

Increasing the amount of twist up to the point of perfect fibre-to-fibre cohesion will increase the strength of the yarns. Too much twist places the fibers at right angles to the axis of the yarn and causes a shearing action between fibers, and the yarn will lose strength. Fine yarns require more twist than coarse yarns.

Low twist 2-3 turns per inch in spun yarns results in lofty yarns. This type of twist allows for napping of the fabric.

Average twist is frequently used for yarns made of staple fibers and is seldom used for filament yarns. The amount of twist that gives warp yarns maximum strength is referred to as standard warp twist.

Hard twist (voile twist) yarns have 30-40 turns per inch. The hardness of the yarn results when twist brings fibers closer together and yarn is more compact. This effect is more pronounced when a twist-on-twist ply yarn is used. This means that the direction of twist in the singles is the same as that of plying twist.



Twist on twist – Ply Yarn

Crepe yarns are made of with either staple or filament fibre. Crepe is a French word, meaning crinkle. They are made with a high number of turns per inch (40-80) inserted in the yarn. This makes the yarn kinky and that it must be twist-set before it can be woven or knitted. Filament crepe yarns are used in fabrics like Georgette and chiffon.

Summary

The type of yarns used has an effect on the fabric texture, hand, warmth, weight, resiliency, durability and luster. Specifications for a particular yarn are determined by end use of the fabric. Yarn differs in weight and fineness and in smoothness, fuzziness, and elasticity. Different yarns are used to create variety in fabrics.

SHORT ANSWER TYPE QUESTIONS:

1. What is yarn twist?

2.How many types of twist are there?

3.Define yarn count.

4.What is a ply yarn?

5.What are textured yarns?

LONG ANSWER TYPE QUESTIONS:

1. Write in detail about classification of yarns.

2. Explain the importance of twist for fabric durability.

3. Discuss about complex yarns.

4. Explain about yarn fineness.

5. Describe novelty yarns with suitable diagrams and examples.

UNIT 6

KNITTING AND WEAVING

Structure:

6.1 Knitting: Different types of knitting

6.2 Weaving: Different types of weaves

Learning objectives:

- To study about the basic fabric construction and other construction methods
- To understand the different structures of weaves and knits and classify them.
- To know about the major characteristics of each type.

Unit preview:

The fabric construction methods are the different types of fabric preparation include weaving and knitting. The process varies based on its structure and techniques involved to produce fabric. The method of construction and machines used are different from each other.

Introduction:

A fabric is pliable and plain that can be made into garments and household textiles and for industrial uses also. The fabrics are usually available in yards or meters. The construction techniques depend on appearance and structure. There are different construction methods of which weaving is the first major method and then followed by knitting.

6.1 Knitting:

Knitting is the formation of fabrics by interlocking of yarns by using knitting needles. It is a common method of fabric construction which

produces stretchable and breathable fabrics. They are used for a diverse range of products such as T-shirts, sweaters, socks undergarments etc. A single yarn or several yarns may be used to form the loops by the use of hooked needles. The first real evidence of knitting machine was the stocking frame invented by Reverend William Lee in 1589. The circular knitting machine and the warp knitting machine came about 200 years later. The single loop is called as stitch and considered as basic unit of fabric structure. The vertical loop of the fabric is called wale and course refers to the horizontal loop seen in figure no 6.1 (a)(b)

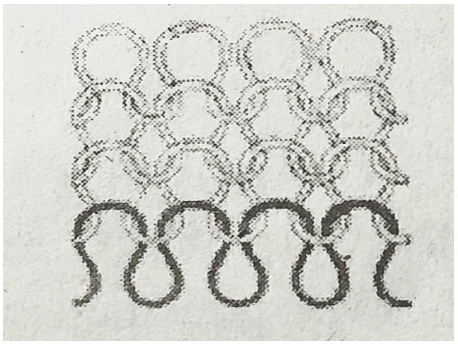


Fig.6.1(a) Course

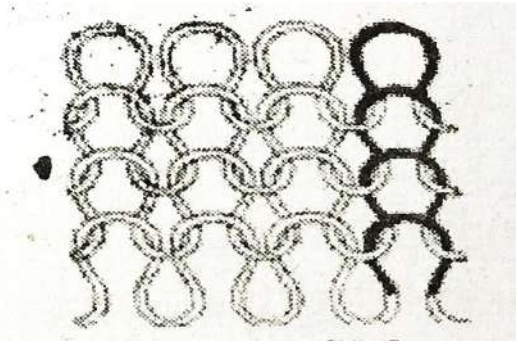


Fig.6.1(b) Wale

The needles are the important elements of knitting. There are three types of needles that are used, they are latch needle, spring bearded needle and compound needle. The sinkers are metal devices that are placed between each pair of needles and help in loop formation, controlling the fabric movement and also help to pull the fabric off the needles.

Different types of knits

Knitted fabrics can be classified into Warp knit and Weft knit.

Warp knitting

It is used for making flat fabrics. The fabric is made by interlocking series of yarns that forms the wales in the line direction of fabric seen in figure 6.2 The warp knits produce fabric such as Tricot, Rachel, and Milanese etc. This is the fastest method of making knitted fabrics.

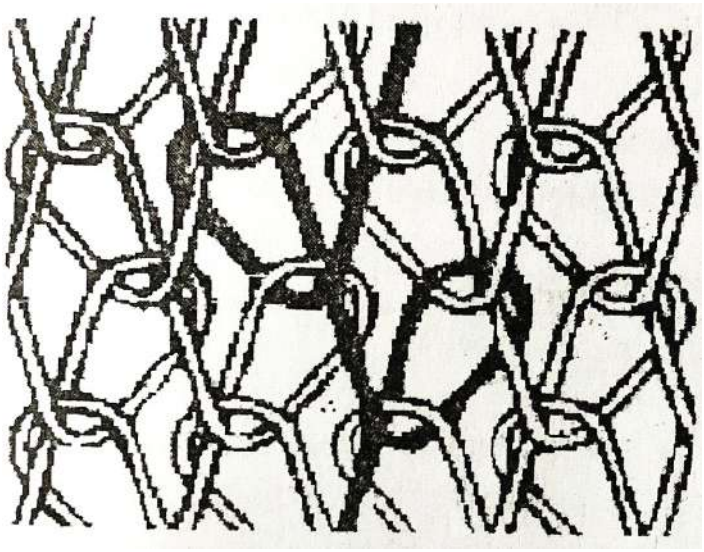


Fig.6.2 Warp Knitting Fabric

Weft Knitting

It is produced by a continuous yarn, which forms courses across the fabric. When compared with warp knitting, this is more versatile method of fabric production. Weft knitting is the simplest method of converting a yarn into fabric seen in figure 6.3. It utilizes one thread to 92 threads depending upon the producer's demand. There are three fundamental stitches in weft knitting Plain Knit stitch, Purl Knit Stitch, Rib Stitch.

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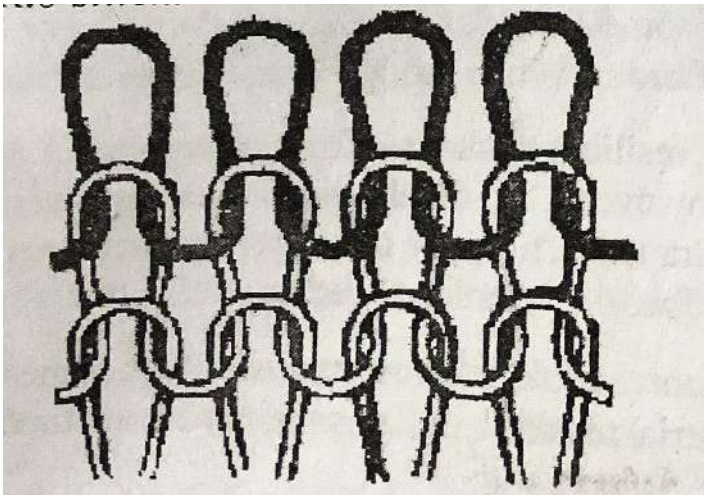

Fig.6.3 Weft Knitted Fabric

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6.2 Weaving:

Interlacing of warp and weft yarn is called weaving. All woven fabrics are based on three types of weaves. The three basic types of weaves are plain, twill and satin. These three types of basic weaves can be made on the simple looms without the use of any attachment. Most of the other weaves are variations or combinations of these three weaves.

Plain weave:

Plain weave is the simplest of the three basic weaves. It is made on a simple loom. Most of the fabrics, we use are made of plain weave. It is formed by interlacing of yarns at right angles passing alternately over and under each other (Fig.6.4). Each warp yarn interlaces with each filling yarn to form the maximum number of interlacing. Plain weave requires only a two-harness loom. It is the least expensive weave to produce. It is also described as 1/1 weave. It means one harness is raised up and one harness is lowered down when the weaving shed is formed.

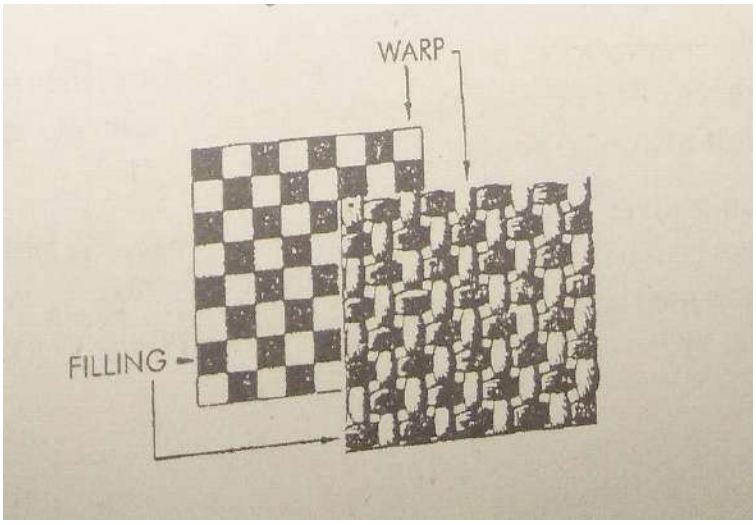


Fig.6.4 Plain Weave

As shown in fig.6.4, it is clear that in the first row, the filling yarn moves over the first warp yarn and then pass under the second warp yarn. In the second row, the filling yarn moves under the first warp yarn and over the second warp yarn. Thus, these rows are repeated to get the pattern of the plain weave.

Characteristics of plain weave fabrics:

- Plain weave fabrics have no right and wrong sides unless they are printed or given any surface finish.
- Plain weave fabrics provide good background for printing and for other surface decorations.
- Plain weave fabrics are inexpensive because weaving is simple.
- They ravel less because of more interlacing and wrinkle more than other types of weaves.
- These fabrics are very firm and sturdy because of more interlacing.
- Plain weave fabrics are less absorbent than other weaves.
- Many interesting effects can be produced by changing the use of different fibre content, novelty yarns, contrast coloured yarns, high twist or low twist yarns in warp and weft.

  Examples: Plain weave fabrics are many in number. Some of them are lawn, long cloth, voile, organdy, chiffon, muslin, casement etc. Plain weave fabrics have a wider range of end uses than other woven fabrics. They can be made in any weight

Variations of plain weave:

Variations of plain weave are rib and basket weave.

Rib weave:

Thicker yarns or group of yarns are interlaced with finer or single yarns to produce this ribbed effect. When the yarns used in the plain weave are uneven, it produces a ribbed effect (fig. 6.5)

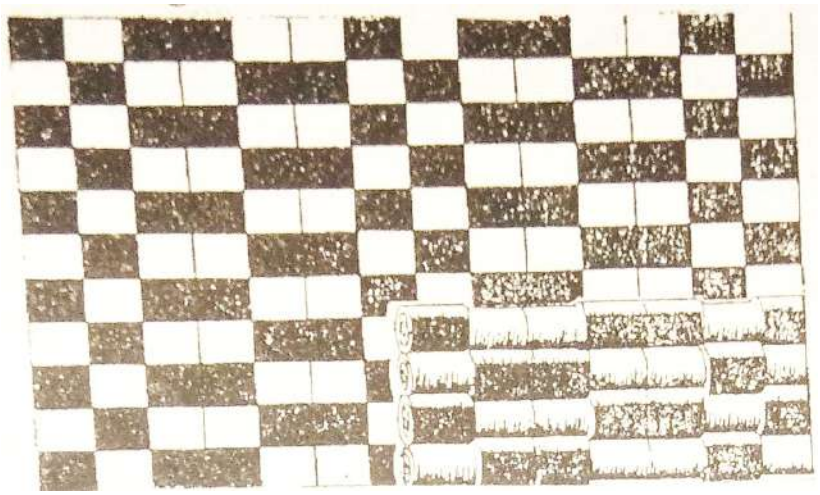


Fig.6.5 Rib Weave

Characteristics:

(1) Rib weave fabrics are interesting and attractive.

(2) Thick and thin yarns will be found in rib weave fabrics. This is also a method of identifying rib weave

Examples: Some of the rib weave fabrics can be listed as follows.

Broad cloth, shirting materials and furnishings.

Basket weave:

Basket weave could have got the name from basket weaving. This weave is similar to basket weaving. Here two or more warp yarns are used as one, and with two or more filling yarns placed in the same shed as in Fig.6.6.

Two or more filling yarns pass over and under two or more number of warp yarns. Basket weave construction is not as very firm and tight as regular plain weave.

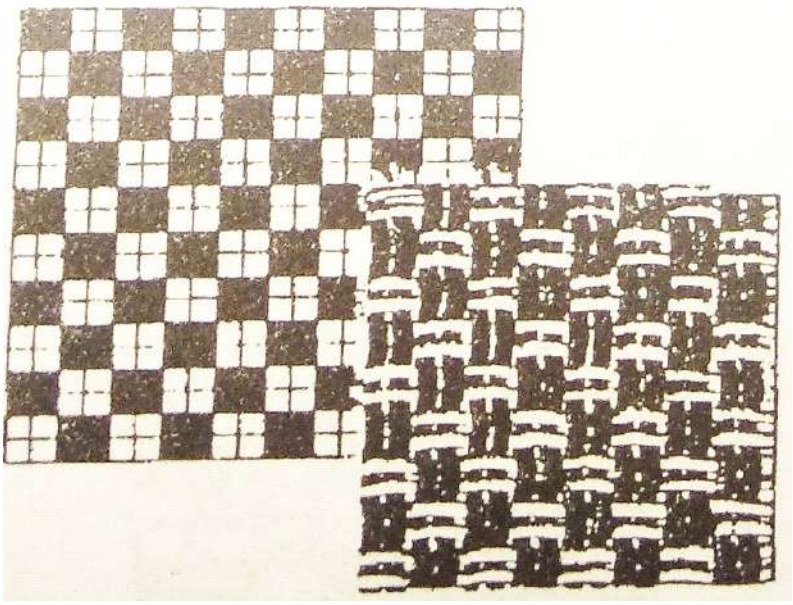


Fig.6.6 Basket Weave

Characteristics:

- Basket weave fabrics are attractive and have interesting surface effects.
- These fabrics have flexibility and wrinkle resistance because, there are few interlacing per square inch.
- These fabrics have a flatter appearance than plain weave fabrics.
- The basket weave fabrics are soft, porous and lustrous.
- Sagging, stretching are some of the problems faced with basket weave fabrics. Examples: Basket weave fabrics are Monk's cloth, Oxford shirting.

Twill weave:

Twill weave is the second basic weave. Fabrics made out of twill weave are in great demand because of its durability. They are suitable for work clothes, sports clothes etc. Twill weave is one, in which each warp or filling yarn floats across two or more filling or warp yams with a progression of interlacing by one to the right or left to form a distinct diagonal line or wale. The twill weave fabrics are characterized by the presence of diagonal lines called wales. A float is the portion of the yarn that crosses over two or more yarns from the opposite direction.

The diagonal line can run either towards the right or the left or can reverse and thus fabrics like herringbone or broken twills, or a warp or filling faced twill, are produced (fig.6.7).

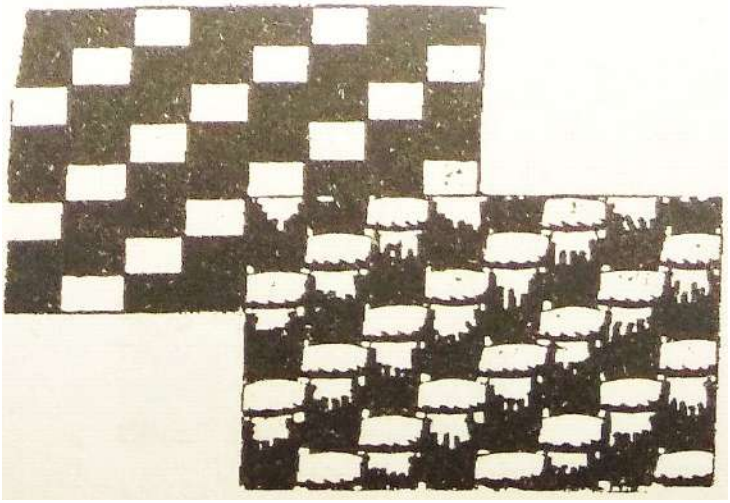


Fig.6.7 Twill Weave

Twill weaves vary in the number of harnesses used. The simplest twill requires 3 harnesses. The more complex twills may have as many as 18 picks.

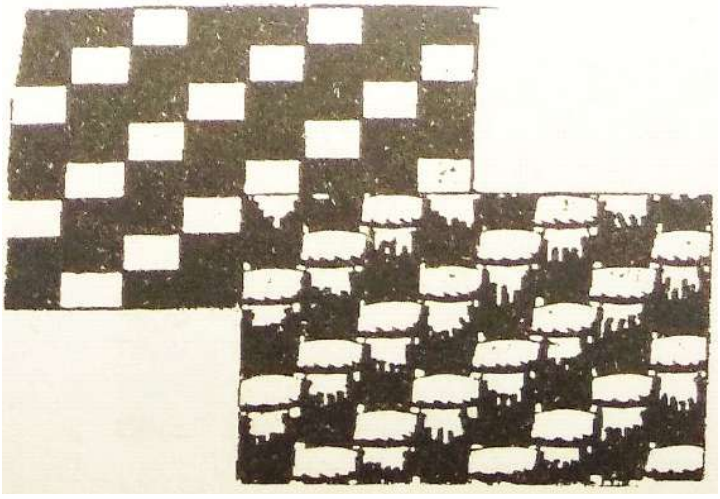


Fig.6.8 Twill Weave

Characteristics:

- Unlike plain weave fabrics twill fabrics have a right side and a wrong side.
- Twill weave fabrics are generally closer in construction and are more durable than plain weave fabrics.
- Twill weave fabrics do not soil easily.
- They are firm, drape well, have more solid in appearance. They show good wrinkle recovery.
- Twill weave fabrics are attractive in appearance and are not usually printed.
- The prominence of a twill wale may be increased by the use of long floats, combed yarns, ply yams, hard twist yarns, or twist of yarns, or by using a twist that is opposite to the direction of the twill line.

Variations:

Some of the variations of twill weave fabrics are even sided twills (fig.6.9), Warp faced twills (6.10), Herringbone fabrics (fig.6.11).

In case of even sided twills, same amount of warp and filling yarns are exposed on both sides of the fabric. They are sometimes called as reversible twills because they look alike on both sides. Examples of even sided twills are Serge, Surah and twill flannel fabrics.

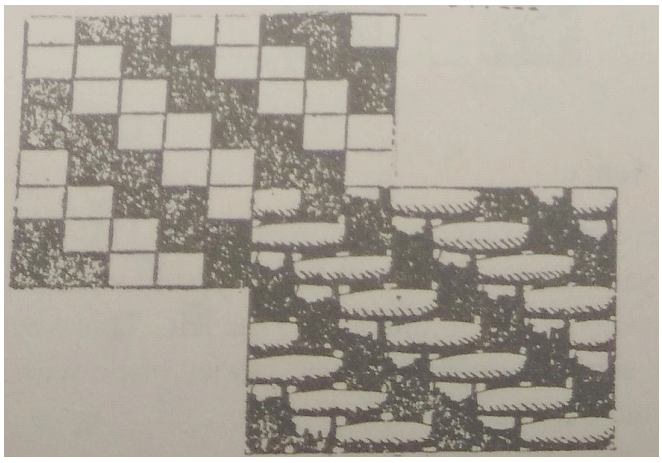


Fig.6.9 Even sided twills

In warp faced twills, there is predominance of warp yarns on the right side of the cloth. These fabrics are strong because warp yarns are usually made of highly twisted yarns. Thus these fabrics have higher abrasion resistance. Gabardine, Denim, Jeans are some of the warp faced twill fabrics.

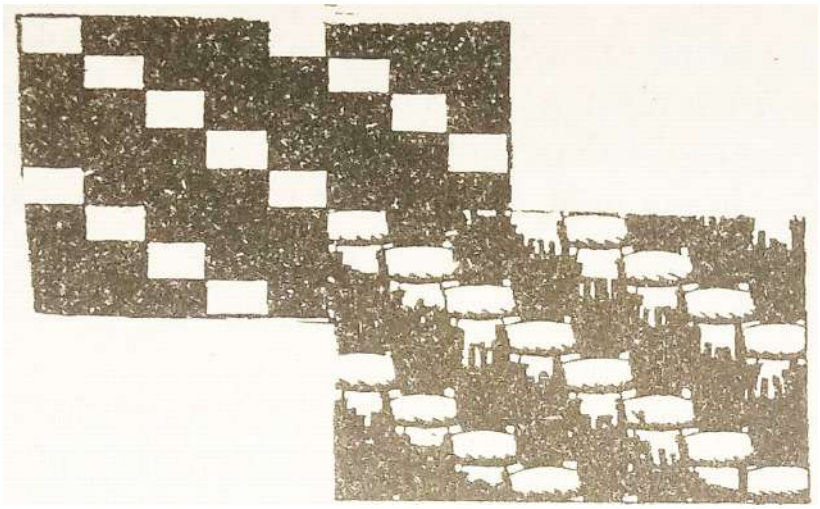


Fig.6.10 Warp faced twills

Herringbone fabrics have the twill line reversed at regular intervals to give a design that resembles the back bone of a fish.

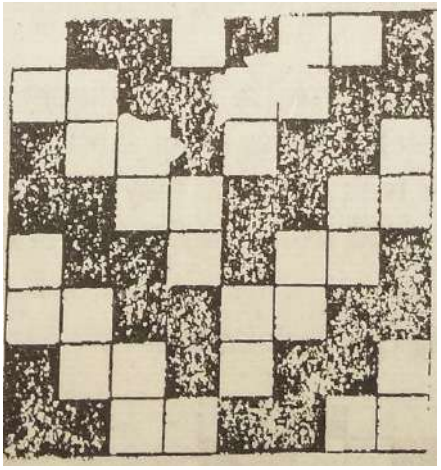


Fig.6.11 Herringbone fabrics

Satin weave:

The third basic weave is Satin weave (Fig.6.12). in this weave each warp yam floats over four filling yarns, with a progression of interlacing by two to the right or the left. This weave can be made on the simple loom. The basic fabrics made with this weave are Satin and Sateen.

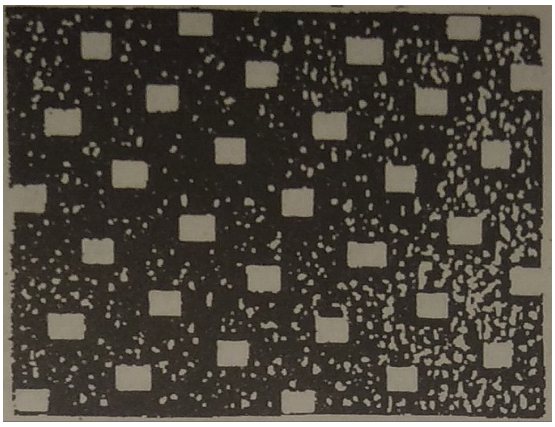


Fig.6.12 Satin weave

Characteristics:

- Satin weave fabrics are characterised by lustre because of the long floats that are found on the surface.
- These fabrics have a right and wrong side
- These fabrics have greater tendency to wear by abrasion. and snagging.
- Satin weave fabrics are smooth, soft and mostly used for lining purposes.

Variations:

A variation of satin weave is sateen weave (Fig.13). It is characterised by filling yarn floats on the surface. Since filling yarn is floating on the surface these fabrics are generally weaker when compared to satin fabrics. Sateen fabrics are lustrous fabrics made of spun yarns.

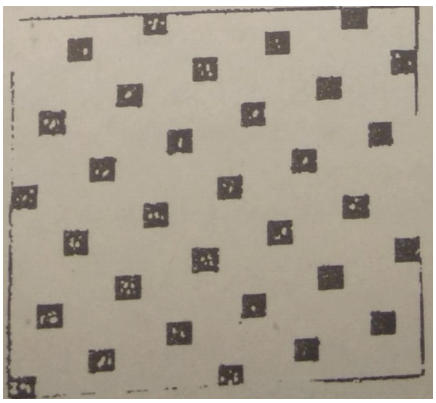


Fig.6.13 Sateen weave

Sateen is cotton fabrics used for draperies and dress fabrics. Examples of sateen weave include sateen crepe, venetian sateen, faille sateen, slipper sateen.

Thus, plain weave and twill weave, satin weave are the three important basic weaves. The fabrics made out of these weaves have special characteristics. Plain weave fabrics are more versatile and easily sew able fabrics. Twill weave fabrics are characterised by diagonal lines. These fabrics are mostly used as work clothes and sports clothes. Satin weave fabrics are selected for their lustre and for soft draping quality.

Summary:

There are three basic weaves. They are (1) Plain weave. (2) Twill weave (3) Satin weave. Depending upon the interlacing of yarns these weaves produce different effects in fabrics. Each weave has definite characteristics and inherent qualities. Most of the woven fabrics fall in any of these weaves.

SHORT ANSWER TYPE QUESTION:

1. What is knitting?
2. What are different types of knitting?
3. Define weave.
4. Mention about types of basket weave.
5. Give examples of twill weave.

LONG ANSWER TYPE QUESTIONS:

1. Write in detail about different types of knitting.
2. Answer the following:
    a. Ribbed weave.
    b. Right hand twill weave.
3. With the help of a diagram explain about basket weave.

UNIT 7

LOOM AND ITS PARTS

Structure

Learning objectives:

- To study about the basic fabric construction and other construction methods.
- To learn about the different parts of the loom.
- To know about the operations of the loom.

Unit preview:

The fabric construction methods describe about the different methods of fabric preparation that is weaving, knitting, lace making, felts and non-wovens. Each process varies based on its structure and techniques involved. The method of construction and machines used are different from one another.

7.0 Introduction

Weaving of cloth developed, at an unknown date and reached a very high point of excellence today. Weaving is an interlacing process. It is the crossing or interlacing at right angles, two or more yarns or strips of material to produce a flat, more or less compact surface. The yarns running in the lengthwise direction are called the warp and the yarns going crosswise are called the filling. The right angled position of the yarns gives the cloth more firmness and rigidity.

7.1 The loom

Weaving is done on a machine called a loom. The primitive loom has changed in many ways, but the principles and operations are still the same. The primitive loom consisted of a frame that held the warp yarns in position as the filling yarns were passed over and under the warp by fingers.

Parts of the loom:

Loom consists of a warp beam at one end and it holds the warp yarn. The woven cloth is wound on a beam at the other end of the loom and the beam is known as cloth beam. The warp beam has total number yarns or ends needed in the length of the fabric. In addition, it may also contain the yarns intended for the selvedge. Each warp yarn is drawn through the eyes of the heddle according to the design planned. For each warp yarn there is a heddle. This heddle is usually a steel wire with an eye in the middle. These heddles are held on steel rods in frames called harnesses. A loom has at least two harnesses. The yarns are then pulled through the reed which is parallel to the harnesses. The reed consists of vertical steel strips, somewhat like the teeth of a comb. These strips are secured at the top and bottom by metal bars.

The spaces between the steel strips of the reed are called dents. The reed does two functions. It acts as a guide or does the guiding job while weaving and acts as a backrest for the passage of the shuttle through the shed. The shed is the triangular space between the two layers of warp yarns caused by the raising and lowering of the harnesses. Shuttle carries the filling yarn through the shed.

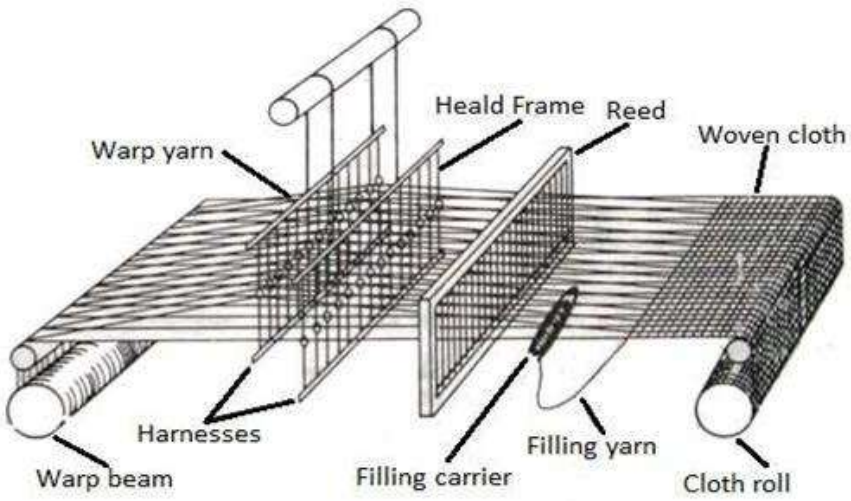


Figure: Basic structure of a loom

7.2 Steps in Weaving:

In any type of weaving four operations are essential, they are shedding, picking, beating up, taking up and letting off.

a. Shedding: The raising of one or more harnesses to separate the warp yams is called shedding.

b. Picking: Passing the shuttle though the shed to insert the filling.

c. Beating up: The reed pushes the filling yarn back into place in the cloth.

d. Taking up and letting off: Winding the finished fabric on the cloth beam and releasing more of the warp from the warp beam.

In any type of weaving these four operations are fundamental. They are performed in sequence and are constantly repeated. These are the parts and operations of a simple loom. Additional harnesses can be used to make more intricate woven designs.

7.4 Power looms

The first power loom was built by the Englishman, Edmund Cartwright in 1785. Originally, powered looms were shuttle-operated but in the early part of the 20th century the faster and more efficient shuttle-less loom came into use. Today, advances in technology have produced a variety of looms designed to maximize production for specific types of materials. The most common of these are air-jet looms and water-jet looms. Industrial looms can weave at speeds of six rows per second and faster.

7.5 Hand looms:

In modern times, hand loom is used much less than power looms. Hand loom is used where small quantity of cloth is produced. In power looms more, cloth is produced in shorter time hence in mills the power looms is used. While weaving on hand looms, various types of designs can be woven in a much better way.

There are two types of handlooms:

1. Pit handloom
2. Frame handloom.

Pit handloom is an old method. Beam and roller for winding cloth are placed on the surface of the earth while the foot board is placed in the pit. It is called as pit handloom. The weavers sit on the ground and weave the cloth. This position is

not very convenient and cloth is not woven quickly. It takes more time than frame handloom. This type of loom is used in rural areas.

FRAME handloom is based on frame and arrangement of a seat for the weaver is made on the frame itself. This type of handloom is easiest and most convenient for making cloth.

Summary

Weaving is a process of making fabrics. Loom is the machine that is used for weaving. Loom consists of parts like cloth beam, warp beam, harness, reed and shuttle. Weaving consists of four successive operations. Woven fabrics are stronger and numerous variations can be created by weaving.

Short answer questions:

1. What is a loom?

2. Mention the parts of the loom.

3.What is a power loom?

4. List the operations of the loom.

Long answer questions:

1. Write in detail about steps in weaving.

2. Discuss about power looms and hand looms.

UNIT 8

FABRIC FINISHES AND FABRIC DEFECTS

Structure

Learning Objectives

- To learn about the finishes and their classification
- To understand the importance of finish for textile materials.
- To gain knowledge in identifying the type of finish
- To have an insight into the type of finish applicable for various end uses.
- To identify the type of finish that can be given to the type of textile material.
- To identify fabric defects.

Unit Preview

Finish is a treatment, given to the fabric, changes the appearance and performance of the fabric. Different types of mechanical and chemical finishes are carried out on different types of fabrics. The mechanical finishes done by using the machines do not use chemicals. But in case of chemical finishes, chemicals are used to modify the structure and performance of fabric. Some of the finishes are given to add weight and bulkiness to fabrics. The detailed methods are discussed in this unit.

8.0 Introduction

Fabrics either knitted or woven are said to be in the raw or gray form until they are finished. In this state they contain many impurities such as starch particles, dirt. oil etc., As a result they have poor hand, feel, drape and

appearance and require processing. To improve the hand, visual appearance and absorbency fabric is given treatments termed as finishes.

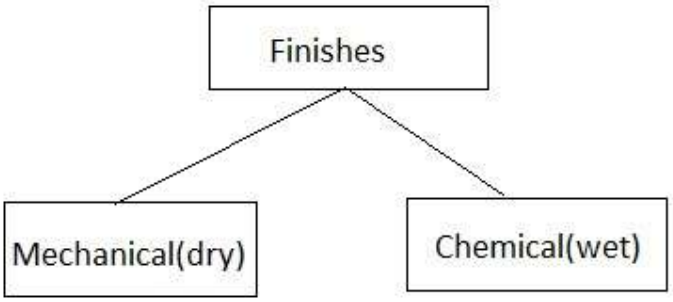
Definition:

A finish is defined as anything that is done to fiber, yarn or fabric either before or after weaving or knitting to change the appearance and performance. The treatment given to a cloth after it is constructed is called finishing. Before the goods are finished they are called as gray goods. Finishes improve the appearance, feel, performance of textiles. Finishes have a great influence on how the final textile products, or garments, will look and perform.

8.1 Classification of Finishes

Mechanical Finishes - These finishes are called as Dry finishes

Chemical Finishes -These finishes are called as Wet finishes



Mechanical Finishes:

Mechanical finishes affect the functions and appearance of fabrics. It modifies the fabric thickness and surface. It creates different textures such as smooth and flat look or a napped flocked texture. They are done by mechanical methods rather than chemicals

1.Calendering:

This is the simplest of all finishes which improves the appearance of a fabric. It is in fact an ironing process done with heat and pressure.

Calenders are used for this finish which contain two steel rollers, one with heating arrangement and a soft roller made of cotton/wool. The different types are shown in figure below.

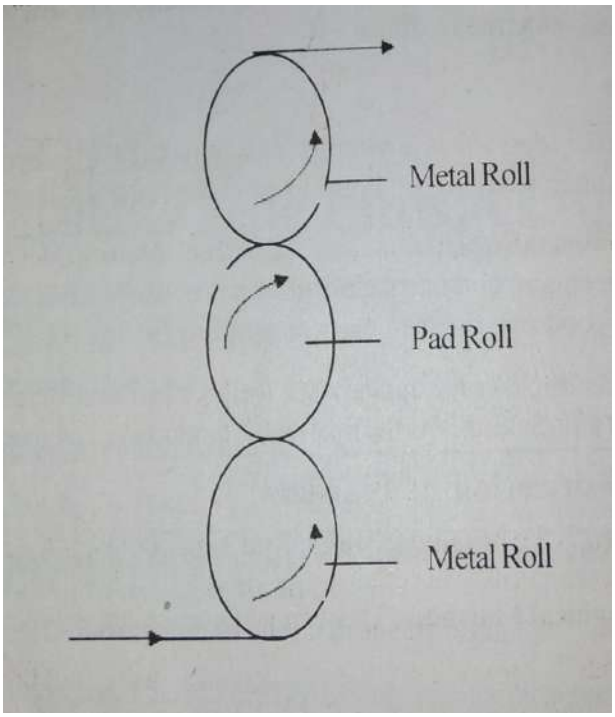


Figure No.8.1a

The fabric is passed between these rollers. This gives the fabric a lustrous, smooth, polished surface. This can be done in different methods based on the end uses. The simple calendaring gives smooth ironed finish.

The friction calendaring provides the glazed smooth surface finish, on the fabric in which the starch or resin used on the fabric before calendaring. The resin finish is durable. The moiré effect is created by placing the fabric in between two rollers of ribbed fabric which presses the ribbed marks on the fabric producing water marked design on fabrics.

The Schreiner Calendaring has a metal roller engraved with 200 to 300 fine diagonal lines that produces deep-seated luster. A flat or raised design can be made by using calenders that are embossed with designs. The heated rollers have engraved sections that form the design on the fabric.

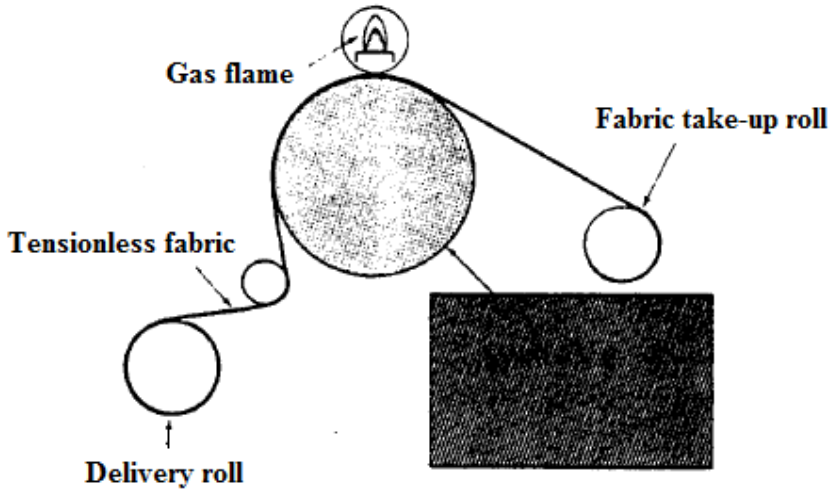


Figure No.8.1b

Activity

You can collect different samples and analyze in the class room. Identify whether your classmates wore such finished garments.

2. Singeing:

Singeing is the burning of short projecting fiber ends from the surface of the cloth for smooth and uniform surface. This operation is given for cotton and wool fabrics. It gives smooth and uniform surface. The cloth is passed over a series of jets of flame, or heated copper plates to singe off any protruding fibers. It is one of the best remedies for the problem of pilling, from the singer the fabric is plunged into water.

3. Tentering

This is a mechanical straightening process for fabrics. The fabrics are dampened and placed on a frame with their selvedges pinned or clipped. The fabric is held tight between two parallel chains either by means of clips or by pins. It gives the fabric its final shape by passing it through heat, while it is in a stretched position. It straightens and gives definite width to the fabric. Tenter machines are two types. The diagram is given above.

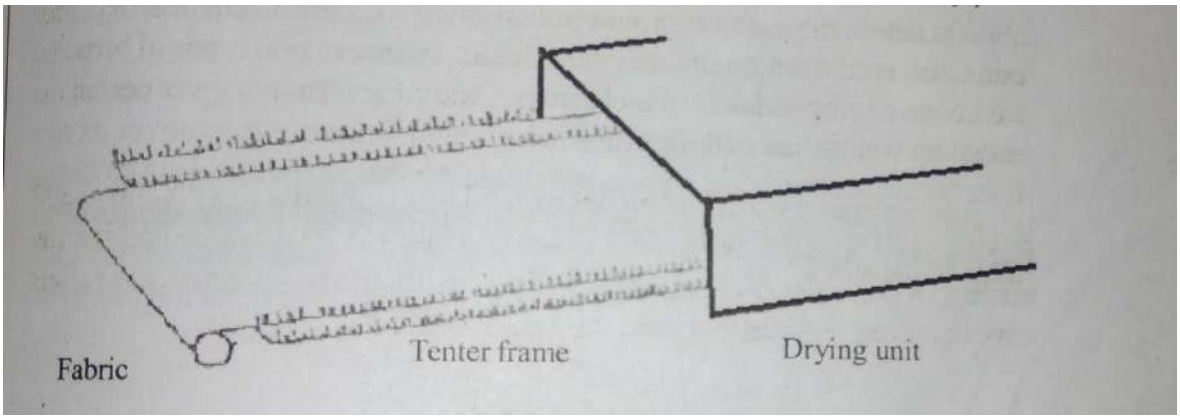


Figure No.8.2

4. Napping

This is a process in which fiber ends are raised on the surface of the cloth by mechanical brushing action shown in figure below. Most napping is done by rollers covered by a heavy fabric in which bent wires are embedded. The finish gives warmth, softness, beauty, water and stain repellency to fabrics. It provides better insulation and is suitable for baby's clothes.

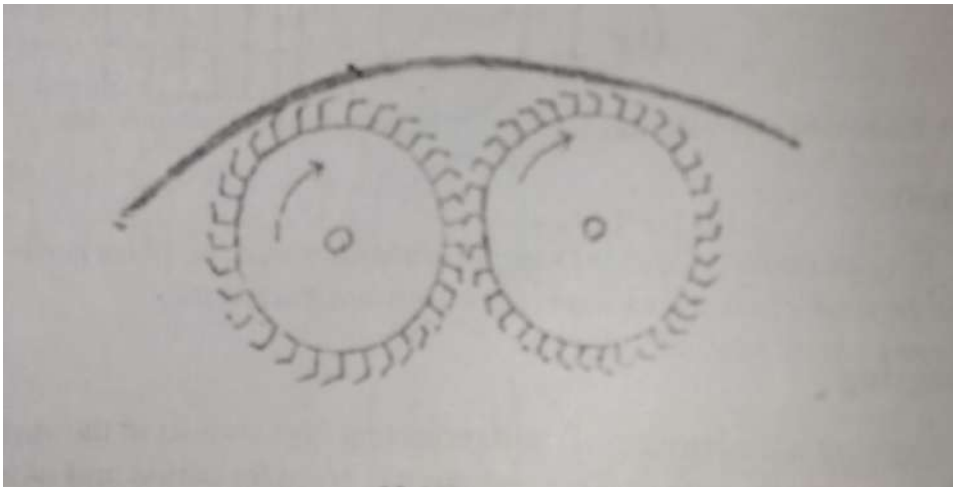


Figure No.8.2

Activity

Check the kind of napped material used for apparels

Chemical Finishes

Chemical finishes generally affect fabric performance They enable fabrics to serve the purposes for which they are made.

1.Bleaching:

Bleaches are used to clean and whiten gray goods. Bleaching can be carried out based on the nature of the textile fibers. There are two types of bleaches such as oxidizing and reducing bleaches Oxidizing bleaches give permanent removal of stain and colour. In case of reducing bleach, it removes oxygen from the stains but the process is not stable. Hydrogen peroxide is an oxidizing bleach and safest bleach. When fabrics are to be dyed in light shades fabric must be bleached.

2. Mercerization

It was a revolutionary development discovered by John Mercer in 1853 a Calico printer, caustic soda is used for treating cotton which makes the fabric stronger, lustrous and more absorbent. Mercerization can be done to yarn and fabric. The fabric is dipped in caustic soda and left for 1 1/2 minutes, and then washed and dried.

3. Acid finishes - Parchmentisation

This is the oldest finish which is used to make the organdy fabric. It gives transparent effects on cotton cloth with the help of strong sulfuric acid. The solution partially dissolves the cellulose and dries which re-hardens the cellulose film and gives crispness and transparency. The small design with large surface transparent area of fabric can be made by localized parchmenting technique. Caustic soda in paste form is printed on the cotton fabric in a predetermined pattern. Caustic soda causes theareas coated to shrink and the untreated areas to pucker that makes the plisse effect.

4. Burnt out or Etched Effects

A fabric constructed of two different yarns, each of a different kind of fiber can be printed with a chemical that will dissolve one fibre but not affect the other. The desired pattern is etched as the burnt-out fibre, leaves a transparent area and the rest of the fabric remains opaque. Etched effects are produced by printing with sulphuric acid.

5. Water-repellent

This finish coats the fabrics with wax, metals, or resins. It causes fabrics to shed water in normal wear, but it does not make them completely waterproof. It repels water-based stains while remaining porous. It cannot resist heavy rain. It may have to be renewed after laundering or dry cleaning.

Additive finishes are applied to give weight, texture and luster and abrasion resistance to the fabric by application of additives such as starch etc. The padding is done by passing the fabric through the finishing solution, under guide roll and between two padding rolls.

The back filling differs from the padding. It has finish only on one side, usually to the wrong side of the fabric. The surface coating is made with rubber latex, acrylic latex, thermoplastics, and resins. It increases abrasion resistance, serve as a binder give luster or provide waterproofing also.

8.2 Classification of Fabric Defects

Woven fabrics are made from interlacing of yarns and often have some defects. Consumers can easily identify defects in woven fabrics. These defects affect the serviceability of the fabric and may not suit perfectly the expected end use. If consumers are aware of these defects they may not buy such fabrics and will go for purchasing of good quality fabrics. In this chapter some of the common defects are discussed.

Reed marks:

Reed is a part of the loom and is made up of vertical steel strips, somewhat like the teeth of a comb. The yarns are pulled through this reed while weaving. Sometimes in woven cloth streaks are visible along the length of the fabric. It is called reed mark and it is caused by the reed in the loom. This defect can be classified under warp defects. These reed marks can be very easily identified due to the presence of open meshy space throughout. This defect cannot be overcome by laundering. If it is too prominent it creates an ugly look. These fabrics are generally graded as seconds fabrics. This defect cannot be rectified.

Broken picks:

Pick is the filling yarn used in the construction of a fabric. While weaving pick is fed in the required place to form the interlacing. Due to some reason or the other if a pick or filling yarn is broken, or pick is missing in few places then this defect occurs. Broken picks may appear in a portion or full width of the fabric. This may give the fabric an ugly look and strength in those places may be less.

Bad selvedges:

Selvedge is the finished edge of the fabric. The width of the selvedge may range from quarter to one inch. Selvedge is the place of the fabric where the

warp yarns and weft yarns end and in few fabrics few more yarns are also included. In a good fabric the selvedge will be straight and thick.

If selvedges are loose, narrow, and crisscross (without being straight), then the fabric is said to have bad selvedges. Due to this the yarns inside may not be at right angles or properly interlaced. This again reduces the strength of the fabric, and in turn the look of the fabric also.

Broken pattern:

In a fabric the pattern or a design can be broken due to yarn breakages. These are commonly found when heavy yarns are used, usually in bed sheets material, drapery material, curtain material etc. If the pattern is broken to a large extent the look of the motif will change. If it happens in one place more number of motifs may get affected.

Thick and thin places:

As the cloth is being woven, in some places thick yarns and thin yarns appear. This happens mostly in filling yarns. ln some places more number of yarns are seen, and in other places less number of yarns are seen. Such defect is commonly known as thick and thin places. This defect will also affect the durability of the fabric.

Floats in a fabric:

Float is characterised by long unbound or uninterlaced yarns left loose on a fabric. Since the yarns are not interlaced the fabric strength will be less. Such fabrics are graded as seconds.

Neps:

Neps are characterised by small balls or rolled fibers on the surface of the fabric. This is usually found in cotton fabrics or blended fabrics. This defect may be due to lack of coherence in the fibers while yarns are processed. This defect interferes with the fabric look, strength, durability, fabric design.

Defects due to dyeing and printing:

Due to improper bleaching, or excess use of chemicals, or due to stains in machinery yellow or brown stains will be seen in the fabric. This can also happen due improper kiering. These stained fabrics show tendering and are damaged very easily. Uneven bleaching will disturb further processing of the fabric.

Dyeing is a process of imparting colour to the fabric. While dyeing if the temperature is not maintained properly, if the chemicals added are more than the required quantity, or proper stirring is not done, streaks of dyeing, uneven shading, occur. They are identified as dark spots or specks of colour on fabric. This defect will not look good if garments are stitched.

Printing is the process of imparting designs on a fabric. Printing is done in several ways. Defects such as misprints, uneven printing, uneven developing, colour streaks, colour stains, dark and light places occur due to improper printing. But these defects are found in cheap fabrics and are easily visible. Printing defects will spoil the beauty of the garment.

SUMMARY:

Fabric defects are many and they may be due to inferior quality of fibers, yarns. They may be due to weaving or dyeing or printing. These defects spoil the look of the fabric and the consumer will not have quality fabrics. It is necessary that the consumer should be aware of such defects for wise selection.

Terms introduced:1. Moire - Water lined effect **2**. Tentering -Straightening

3. Plisse -Puckering effect

SHORT ANSWER QUESTIONS:

1. What is a finish?

2. Mention the types of finishes.

3. Name any two fabric defects.

4. What is singeing?

5. What are bad selvedges?

LONG ANSWER QUESTIONS:

1.Answer the following:

a) bleaching b) calendering c) napping

2. Write in detail about defects due to dyeing and printing.

3.Discuss about fabric defects.

UNIT 9

STAIN REMOVAL

Structure:

9.1 Introduction

9.2 Common stains

9.3 General instructions to remove stains.

LEARNING OBJECTIVES:

By learning this unit, the student is able to understand

- Common stains.
- Nature and classification of stains.
- To use appropriate reagents for the removal of stains.

UNIT PREVIEW:

Stain is an unwanted mark. Stain is a spot or discolouration caused on fabrics by contact or absorption of some foreign substance.

9.1 Introduction

Selection of appropriate clothing is an art. Choosing correct clothing calls for creativity and individuality. Clothing expresses the personality of the wearer. Selecting clothing is one aspect and maintaining is another aspect. To increase the longevity and durability of clothing, proper care must be taken. Cloths should be devoid of stains, tears and smell. Stains should be removed from cloths to give them a neat appearance.

For successful stain removal, prompt action is important. The more quickly, one deals with a stain, the more likely one is able to remove. With most stains, try cold water first, flushing the water through the material if possible. Make sure that one should know about the cleaning agent, one uses.

But as a general rule, one can safely use lemon juice, vinegar, and bicarbonate of soda. Stain removal and spotting is a skill to be developed with practice.

Stains are classified according to the substances that cause them. Broadly speaking they can be divided into,

(a) Animal

(b) Vegetable

(c) Grease

(d) Dye and

(e) Mineral.

Animal stains are those caused by blood, egg, milk and meat juice. As these contain protein matter, heat must be avoided in removing them, otherwise the protein matter will get fixed in the stain.

Vegetable stains include those caused by tea, cocoa, coffee, fruit and wine. These are acidic and therefore, require alkaline reagents to remove them.

Grease stains may be just grease spots or some colouring matter fixed with grease. These include butter, curry, oil paint, varnish, and tar stains. In removing these stains, grease solvent or an absorbent is first used to dissolve or absorb grease before the removal of the colouring matter. A solvent soap is also very effective for removing these stains from washable fabrics.

Dye stains may be acidic or alkaline, so the nature of the stain is ascertained before a specific removing reagent is used.

Mineral stains, such as ironmould, black ink and certain medicine stains are compounds of a metal and a dye. These are first treated by acid reagent to act on the metal, and then by an alkaline solution to neutralize the acid reagent and act on the dye.

9.2 General directions

1. All stains are easily removed when fresh.

2. If the nature of the stain is unknown the least harmful method must be used. First passing from mild reagent to stronger ones.

a) Soak in cold water.

b) Soak in warm water.

c) Bleach in the open air, if time permits.

d) Treat with an alkaline solution.

e) Treat with an acid solution

f) Treat with oxidizing bleach, if the above fail.

g) Treat with reducing bleach.

h) In the event of stain persisting, which is unlikely processes (d) and (g) can be repeated

3. Known stains should be treated by their specific reagents.

4. Bleaching treatments should only be tried as the last resort, and these should take the form of several applications of weak solution rather than the use of strong solution in one application.

5. Reagents may be spread on to white cotton and linen fabrics and boiling water may be poured through the fabric.

6. Reagents must be made into a solution when used on coloured linen, wool, silk, and rayon.

7. The fabric should stay in the reagent only, until the stain is removed, and the fabric should be taken out at once. If the reagent is allowed to dry into the fabric it may damage it.

8. An acid stain removing agent should be neutralized by an alkaline rinse.

9.3 Common stains

Artificial flowers

Place dirty artificial flowers in a large paper bag add lots of salt and shake vigorously. Then run water through the flowers and watch the dirt just wash away.

Ballpoint ink

Dab the mark with methylated sprit, then rub and rinse.

Blood

A fresh bloodstain on clothing can be rinsed out in cold salt water. If the stain is dried, bleach with a drop of hydrogen peroxide.

Grass

A cleaner way is to rub with a piece of lemon sprinkled with salt, rinse and dry.

Butter

Scrape off as much as possible. Iron with a warm iron between layers of absorbent paper.

Candle wax

Put in a plastic bag in the freezer for an hour or two. Then place the fabric between sheets of blotting paper and iron with a warm iron.

Cane furniture stains

Cane furniture stains can be cleaned and lightened by scrubbing with hot salted water.

Chewing gum

Put the garment in a plastic bag in the freezer for a while or put an ice pack on the gum. Crack off the solid pieces. Sponge the remainder with dry cleaning fluid.

Chocolate

On clothing, scrape off the solid chocolate with a blunt knife. Pour boiling water from a height or use detergent and work from back of the stain.

Coffee

Sponge stains with borax and pour hot water through the fabric.

Curry

Soak stain with methylated spirit or diluted ammonia or white spirit.

Hair dye

Rinse fabric immediately with cold water, then wash in warm water with liquid detergent and ammonia.

Perspiration

Stain can be removed by eucalyptus oil and with few drops of ammonia.

Iron rust

Sponge with oxalic acid, rinse well or spread with salt. Moisten with lemon juice and place it in sun.

Jam stains

Remove jam stains from washable clothes by soaking in a solution of borax and water, and then wash as usual.

Lipstick

For lipstick on fabric, try cold water first and if that fails, put glycerine on the stain, leave overnight, then wash with warm to hot sudsy water.

Ointment stain

Try dry cleaning solution, then rinse in cold water. Then work in liquid detergent and rinse again.

Ink (black and blue)

a) Rub the stain with a cut tomato and wash

b) Rub salt and wash.

c) Repeat the process till stain is removed

d) Soak the stain immediately in sour milk or curd for half an hour. Do not allow the curd or milk to dry. Wash with soap and water.

e) Apply salt and lime juice and leave it for half an hour and wash.

Tar

Use kerosene. Follow usual washing procedure to remove kerosene smell.

Grease, oil and ghee

Wash with hot water and soap. If washable same as white cotton. For un washable, treat with grease absorbent. Spread French chalk or fuller's earth on the stain, leave it for one hour. Brush off the powder

Pan

a) Treat with $KMNO_4$ solution b) Treat with sodium perborate Use hydrogen peroxide, wash with soap water.

Medicine

a) Steep in warm water

b) Steep in oxalic acid and wash with borax solution

c) Steep in methylated alcohol or surgical sprit

Turmeric

a) Soak in hot soapy water and dry in the sun or grass.

b) Apply a few drops of hydrogen peroxide, leave for few minutes. Rinse thoroughly and dry in the Sun.

c) Treat with oxalic acid.

Curry

a) Wash with soap and water

b) Bleach with Sunlight and air

c) Bleach with Javelle water

Shoe polish

Scrape off the stain if dry. Apply little grease and wash with hot water and soap.

Egg

Wash in cold water and then in warm water and soap. Apply salt and pour warm water through.

Rust

(a) Steep in oxalic acid and then rinse with dilute borax solution Steep in solution of salt and lemon juice.

(b) Bleaching in the sunlight is best. Apply soap lather to the stain and place it in the sun. Keep the stain with moisture while it is in the sun

(c) Rub dry borax and place wet muslin over the stain.

(d) Steep in dilute ammonia. Place the fabric in the Sun for bleaching.

Nail polish

Apply acetone to the stained area with a cotton pad. Acetone must not be used on acetate rayon fabric.

Ice cream

(a)Wash in cold water and soap.

(b)Steep in warm borax solution

(c)Sponge with petrol or carbon tetrachloride.

Perfume

(a) Treat with ethyl alcohol

(b) Bleach with hydrogen peroxide

Summary

A well-informed consumer is the one, who can recognize and interpret the inherent characteristics of a textile fabric in the light of its intended use. With knowledge of facts about the stains, one can judge its probable, removing methods. One can also try indigenous methods by using household reagents.

Short answer type questions

1What is a stain?

2.List out animal stains.

3.List out vegetable stains.

4.How do you remove a perfume stain?

Long answer type questions

1. Classify stains based on their composition, with examples.

2.Describe the methods and care to be taken while removing stains.

UNIT 10

DRY CLEANING PROCESS

Structure

Learning objectives

After learning this unit, a student is able to know,

- History and process of dry cleaning
- To know about the methods of storing clothes when not in use.

Unit preview

Dry cleaning is a method used to clothes, for which ordinary washing methods cannot be used.

Storage of cloths refer to the methods followed to keep them safe and fresh when not in use. For example, woollens are used only in winter and silks only for occasions.

10.0 Introduction

Dry cleaning is any cleaning process for clothing and textiles using a chemical solvent other than water. It is used to clean fabrics that degrade in water, and delicate fabrics that cannot withstand the rough and tumble of a washing machine and clothes dryer. It can eliminate labour-intensive hand washing.

Unlike what its name implies, dry cleaning is not a 'dry' process. Clothes are soaked in a solvent other than water. Tetrachloroethylene

(perchloroethylene), which the industry calls "perc," is the most widely used solvent. Alternative solvents are trichloroethane and petroleum spirits.

10.1 History

Modern dry cleaning's use of non-water-based solvents to remove soil and stains from clothes was reported as early as 1855. The potential for petroleum-based solvents was recognized by French dye-works operator Jean Baptiste Jolly, who offered a new service that became dry-cleaning. Flammability concerns led William Joseph Stoddard, a dry cleaner from Atlanta, to develop Stoddard solvent (white spirit) as a slightly less flammable alternative to gasoline-based solvents. The use of highly flammable petroleum solvents caused many fires and explosions, resulting in government regulation of dry cleaners. After World War I, dry cleaners began using chlorinated solvents. These solvents were much less flammable than petroleum solvents and had improved cleaning power

10.2 Dry Cleaning Process

A dry-cleaning machine is similar to a combination of a domestic washing machine and clothes dryer. Garments are placed in the washing or extraction chamber (referred to as the 'basket' or 'drum'), which constitutes the core of the machine. The washing chamber contains a horizontal, perforated drum that rotates within an outer shell. The shell holds the solvent while the rotating drum holds the garment load. The basket capacity is between about 10 and 40 kg (22 to 88 lb).

During the wash cycle, the chamber is filled approximately one-third full of solvent and begins to rotate, agitating the clothing. The solvent temperature is maintained at 30 degrees Celsius (86 degrees Fahrenheit), as a higher temperature may damage it. During the wash cycle, the solvent in the chamber (commonly known as the 'cage' or 'tackle box') is passed through a filtration chamber and then fed back into the 'cage'. This is known as the cycle and is continued for the wash duration. The solvent is then removed and sent to a distillation unit consisting of a boiler and condenser. The condensed solvent is fed into a separator unit where any remaining water is separated from the solvent and then fed into the 'clean solvent' tank. The ideal flow rate is roughly 8 litters of solvent per kilogram of garments per minute, depending on the size of the machine.

Garments are also checked for foreign objects. Items such as plastic pens that may dissolve in the solvent bath, damaging the textiles. Some textile dyes are "loose" and will shed dye during solvent immersion. Fragile items, such as

feather bedspreads or tasselled rugs or hangings, may be enclosed in a loose mesh bag to provide mechanical support.

Not all stains can be removed by dry cleaning. Some need to be treated with spotting solvents, sometimes by steam jet or by soaking in special stain-remover liquids, before garments are washed or dry cleaned. Also, garments stored in soiled condition for a long time are difficult to bring back to their original colour and texture.

A typical wash cycle lasts for 8–15 minutes depending on the type of garments and degree of soiling. During the first three minutes, solvent-soluble soils dissolve into the perchloroethylene and loose, insoluble soil comes off. It takes 10–12 minutes after the loose soil has come off to remove the ground-in insoluble soil from garments. Machines using hydrocarbon solvents require a wash cycle of at least 25 minutes because of the much slower rate of solvation of solvent-soluble soils. A dry cleaning surfactant "soap" may also be added.

At the end of the wash cycle, the machine starts a rinse cycle where the garment load is rinsed with freshly distilled solvent dispensed from the solvent tank. This pure solvent rinse prevents discoloration caused by soil particles being absorbed back onto the garment surface from the 'dirty' working solvent. After the rinse cycle, the machine begins the extraction process, which recovers the solvent for reuse. Then the drying cycle starts.

During the drying cycle, the garments are tumbled in a stream of warm air that circulates through the basket, evaporating traces of solvent left after the spin cycle. The air temperature is controlled to prevent heat damage to the garments. The exhausted warm air from the machine then passes through a chiller unit where solvent vapours are condensed and returned to the distilled solvent tank.

10.3 Storage of clothes

If you live in a climate where there is more than one season, you should store off-season clothing

Based on the season different types of clothes are required. Off-season clothes must be stored carefully to avoid damage from insects, mildew and mould. Clothes must be washed thoroughly before storing.

1. Sorting of clothes: Clothes must be sorted according to their properties for storing. Such as cotton clothing woollen clothing blankets, sweaters,

excessively soiled, slightly soiled. If differentiated this way it is easier to store them after necessary processing.

2. Brushing clothes: Brushing is necessary to shake off dust from the clothes. Brushes of different types and sizes are available for the purpose. There is possibility of dust settling on the entire cloth and the folded portions of the clothing. Hence dust must be first removed by brushing.

3. Airing: Clothes which are to be stored for a long time should be cleaned. It is enough if some clothes are only brushed. Stored clothes should be spread in open air from time to time so that clothes do not smell.

4. Mending: Clothes must be mended before washing. Before, storing clothes they have to be examined for tears or holes. The most satisfactory methods of mending torn or worn worn-out garments are patching and darning.

Darning is a method of repair in which threads or yarns are worked into the weave or knit of the fabric. Darning is useful in mending small holes and tears.

Patching is a type of mending where in the place of tear or hole, an additional piece of fabric of the same kind is inserted and stitched. For repairing a big hole, patching is more suitable than darning. It is stronger and can stand more wear and tear in laundering.

5. **Washing of clothes**: While washing clothes, the method used should be according to the type of fibres of which they are made. In the course of washing, hard water, low quality soap, heavy scrubbing, beating, wringing tightly, drying in sunlight should be avoided. Clothes to be stored should be completely dry. If there is moisture they are quickly infested by mould. The storage place (Almirah, wardrobe etc), should be dry. To prevent being harmed by moth naphthalene balls or neem leaves should be kept in the storage place. Clothes which cannot be washed by water should be dry cleaned. They should be hung on hangers or stored in boxes after properly folding them.

Storage of clothes

Storage of cotton clothing. Cotton clothing should be washed, cleaned before storing. But, they should not be starched, as starched clothes are easily affected by mildew. Clothes which are not frequently used like Zari, should be spread in open air from time to time, so that they do not develop odour. Storage space should be dry.

Storage of silk clothing: After every use silk clothes should be washed. They should be washed clean to avoid any smell and damage caused by perspiration. Since weighted-silk have a tendency to tear in folds, they should be hung on hangers. Polyethene covers should not be used as there no passage of air. Paper covers without any print should be used for storing silks. The printing ink on the paper covers may attract insects. Sandal-wood power and dried neem leaves are used to protect silks.

Storage of woollen clothing: Woollen clothes are used for few months, that is in winter. Thereafter they are not required for a long period. Hence, they have to be carefully stored. Before storing woollens should be thoroughly washed by using alkaline-free soaps. They should be dried flat for two to three days to remove the moisture completely. Woollens do not require ironing. The should be folded properly, if possible wrapped in light weight cotton cloth which is devoid of starch, to protect them from moths and other insects. Besides naphthalene balls, dried neem leaves, dried tobacco and eucalyptus leaves can be used to retain the freshness of the clothes.

Storing of other fabrics: Clothes like blankets, comforters, counterpanes, extra bed-linin, table linen bathroom accessories like towels, bathrobes and kitchen linen should be washed from time to time and stored in a clean dry place. Fabric fresheners and moth balls can be used to maintain the freshness.

Summary: Dry cleaning is a method of washing of clothes for which water cannot be used. In dry-cleaning, solvents and absorbents are used for stain removal and to clean the fabrics.

Clothes which are not in use should be stored properly. Woollens are used only in winter and silks are for occasions. These must be stored carefully so that the longevity can be increased.

Short answer type questions:

1. What is meant by dry cleaning?
2. Mention the chemicals used for dry-cleaning.
3. How are cotton clothes stored?

Long answer type questions:

1. Explain the process of dry-cleaning.
2. How do you store woollens and silks?
3. What are the general principles to be followed while storing clothes.?

FASHION & GARMENT MAKING

Paper - III

FASHION & APPAREL DESIGNING

INDEX

UNIT 1

Design

Structure

Learning Objectives

After studying this unit, a student will be able to

- Understand the importance and types of art elements in dress design
- Identify the elements that influence clothing
- Distinguish between different elements and principles of design
- Emphasize the influence of different elements and principles in dress
- Apply relevant principles in correcting the figure faults
- Understand the elements interaction with the help of principles

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Unit Preview

Art elements like line colour, texture and shape of the garment plays a prominent role in dress design besides creating some visual effects on the physical proportion of the individual. These elements are arranged in a particular fashion based on the principles of design. Both art elements and principles are dependent on each other and are interdependent too in creating a complete dress design.

1.0 Introduction

Garment designing involves three major aspects - structure, function and decoration. A garment should be structurally valuable and appropriate as per the customer's need and the day's fashion. Functionally it should permit the activity of a

person and decoratively suitable to the garment and the wearer. Garment designed with the above three aspects lends itself to be accepted by the customer. Designing garments is also an art and so the elements and principles of art are also applicable here.

When designing, there are several ideas or aspects of design that need to be kept in mind. These aspects of design can be categorized into two areas: Principles and Elements of Design. They are defined as the basic blocks or components from which a visual design is made. Although the elements are unique and fundamental in nature, they are not always exclusive but are dependent on each other. For example, shape cannot exist without line and space. Though various authors group elements separately, the fundamentals remain the same.

1.1 Elements of Design

Line:

Line is a fundamental element of design which establishes the outline of a garment. It is an extremely useful and versatile realistic tool that is made to function in bothvisual and verbal ways. Line leads the eye in the direction it is going, and divides the areas through which it passes, thus providing a breaking point in space. It defines a shape or a silhouette and conveys a mood or a character. Line can create visual illusions, such as height and width and also makes a figure look thin or bulky. It manipulates space: line divides it, encloses it, organizes it, pushes and pulls it, separates and contours it.

Definition: Line is an elongated mark, the connection between two points, or the effect made by the edge of an object where there is no actual line on the object itself.

There are certain characteristics that each line possesses – path, thickness, evenness, continuity, sharpness, contour consistency, length and direction. These aspects or characteristics of line give it a powerful role in dress.

In garments, lines can be categorized in fourways:
Directing
Dividing
Psychological effect
Optical illusion
All garments contain a combination of lines from each of these categories.

Directing

Line creates movement by leading the eye up and down, side to side or around the garment line may be straight, curved, or bent horizontal, vertical; or it may be a combination of these directions.

Dividing

Line may divide large areas and make shapes or connect shapes and garment parts.

Psychological effect

We respond to the quality and character of a line by associating different types of lines with certain emotional and psychological states.

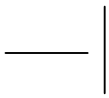
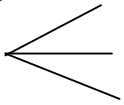
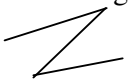
Optical illusion

Lines may cause visual distortions, which affect the way a garment appears when being worn. Depending on the skill of the designer, these effects may conceal figure irregularities or exaggerate them.

A. Line types

According to the type, lines are of three types – straight, curved, and jagged lines (Fig 1.1)

Fig: 1.1 Types of lines

Types of Lines	Visual effect	Decorative use
1. Straight line 	Opposes natural curves, countersroundness, slims	Row of buttons, Zippers, Tucks,Braids.
2. Vertical line	Slims, adds height	Any trim
3. Horizontal line	Shortens, widens, broadens	Welt pockets, tabs
4. Diagonal Line 	Slims if vertical & widens if horizontal	Pockets and shoe laces
5. Zig-Zag 	Angular, roundness, eye-catching	Sleeves Rick-rac
6. Perpendicular 	Attracts attention	Any trims
7. Alternating 	Eye catching, dominant may be too violent	Any trims
8. Cross – over 	Creates a focal point at the point of intersection	Lacing, any trims
9. Converging 	a) Dragging, descending b) Uplifting, Light Emphasizes direction	Pockets, Quilting, any trims
10. Full curve 	Emphasizes body curves, counters thinness and sharp angles, better on thick bodies	Pockets, collars any type

1. Straight-line: All garments have some straight lines in them which help to emphasize body angularity and neutralize the roundness of the body. Seams, darts, hems or garment edges, pleats, hems, trims, braids, tucks and panels are all straight lines. They create a feeling of elegance, bold and powerful effects in a garment. Use only limited number of straight lines in a dress as more straight lines can give a stiffer look.

2. Curved lines: Curved lines are less conservative, formal and powerful than straight lines. Circles and curves make spaces look larger than they really are. They increase the size and shape of the figure adding interest to a design. They give soft, gentle, youthful and flowing feeling. But too many curved lines in a dress can create a confusing look too, therefore to be avoided.

a. Full curve: Emphasizes body curves, counters thinness and angularity giving a young, youthful, feminine, dynamic character. In a dress full curves are introduced through seams, garment edges and scalloped edges.

b.Restrainedcurve: These curves slightly emphasize curves of the body. Yet they give soft, gentle, feminine and graceful effects. Soft, shallow curves suggest comfort, safety, and relaxation. These are introduced in dress by seams, garment edges, princess lines, trims, gathers, draping and fabric pattern.

c. Zig Zag lines: These lines have sharp points like zigzags, which change the direction abruptly due to their points. These types of lines give a feeling of jerky, busy, exited effect. They also emphasize angularity. When they are used more than required, these lines can create a feeling of confusion in dress. As they are very noticeable their use should be judicious. Decorative fabric pattern and trim like rickrack can help create this effect. They are also used to combine different patterns and textures.

B.Line Direction:

According to the direction, lines may be vertical, horizontal, or diagonal.

a. **Vertical lines** communicate a feeling of self-importance, dignity, strength and spirituality. They lead the eye to move up and down. They give the impression of added height and slimness. Dresses having vertical lines if worn by a thin person, it makes the person look even taller and thinner. Vertical lines are found in a shit front., princess line center back seam, darts, pleats, tucks and in fabric pattern. These lines are best used on short & hefty figures.

b. ***Horizontal lines suggest*** a feeling of rest or relaxation. Therefore, garments in which horizontal lines dominate tend to be quiet, relaxed and restful in feeling. These lines will direct the viewer across the garment, emphasizing its width at that point. That is, they give the impression of more width and less height i.e. the body looks shorter and wider. So, their placement is done where a wider and broader feeling is required. For example, a band or seam at the hipline will make the hips seem wider. Horizontal lines are found at waistlines, hemline, wide neckline, sleeves, collars, panels, midriffs and in belts.

c. Diagonal lines are slanted and they suggest a feeling of movement or direction. Diagonal lines in a garment tend to slenderize the whole, more than vertical lines. They are strong and draw attention to the area where they are used. Since objects in a diagonal position are unstable in relation to gravity, they are either about to fall,

or in motion. Thus, if a feeling or movement or speed is desired, or a feeling of activity, diagonal lines can be used. Their degree of slant determines their visual effect in clothes. If they have a vertical slant they give slenderness feeling and if they are horizontally slant they add width. When these lines are combined with vertical lines, a figure seems the tallest as they tend to create a more slenderizing effect (fig.1.2). These lines are found generally in panels, seams, darts, 'V' necklines, collars & lapels, flared trousers. 'A' line skirts, bias cut stripes and raglan sleeves.

a. Straight line b. Horizontal line c. Diagonal line

Fig 1.2 Direction of line

C. Application of Lines in garments

Lines are incorporated into clothing in two basic ways – structural and decorative.

a. ***Structural lines***: Structural lines are most visible if the fabric of the garment is plain. They can be introduced through constructional lines like seams, darts, fitting tucks and

shirring. Creases and folds created by pleats, gathers etc. also give structural line effect in a garment.

b. ***Decorative lines***: Decorative lines are created by adding details to the surface of clothing. They are added simply to decorate the garment and make it more interesting. They add style and personality. They can be formed by adding rows of buttons, topstitching, braids, piping, bias binding lace edging, faggoting ruffles, fringe etc. Fabric pattern lines such as stripes, plaids herringbone, checks etc. also add lines decoratively.

D. Types of illusions created by line in dress

Different lines are mixed in garments. Skillfully used lines can create various visual illusions.Lines lengthen an area more or less depending on the direction of line "tails" as shown in fig1.3.When diagonal lines are added to each end of a straight line pointing towards the center, it looks shorter than when the diagonal lines on each end keep the eye moving out.

A horizontal line and vertical line of the same size when placed together, the horizontal still appears to be small due to illusion.

In clothing, lines often combined into designs that appear to form an arrow or the letters T,I or Y (Fig.1.3). These configurations cause certain optical illusions. Lines that form an arrow tend to redirect the gaze downward. They shorten or reduce the height of a person. Lines that form a "T" also stop the upward movement of the eye. Lines that form an "I" tend to give a vertical feeling and makes the body look somewhat taller and thinner. Lines that form a "Y" keep the gaze moving upward even further. The appearance of even more height is given to the body with a raised collar or a V neckline.

Lines spaced far apart make the figure look larger than they are nearer. A panel at the center of the dress can create this effect. Also, when the lines are bold like in stripes draw the attention of the looker. They make a person look larger than he or she actually is.

So, illusion of width and height, thin and thick are all possible in a dress by tactful use of line in garments. It often helps one to conceal figure irregularities and help to overcome them skillfully.

Fig 1.4 Illusion created by line spacing

Activity:

Identify a person in the class who is wearing a garment with lines and analyze them for the effect learnt by you.

Draw a dress design on a paper and try to draw different lines in the garment and evaluate in terms of the effects that are created without changing the size of the garment.

II. Colour

The human eye can identify approximately 30,000 different colours. Colours are the most exciting, versatile and strikingly visible element of design. It is this colour which attracts the consumer to the store for purchase rather than style and texture. Colour in apparel creates optical illusion, thereby helping the wearer to camouflage the undesirable features and to build his false figure image.

Colour has three characteristics namely, hue, value and intensity.

The traditional colour name of a specific wavelength of light is a **hue**. While **value** being one of the characteristic concerned with the light and dark properties of colour. All colors exhibit these properties. The brightness and dullness of colour is called saturation which is concerned with the **intensity**. Among different characteristics value is most critical as it refers to the relationship between light and dark on a surface or object and it is also referred to as tone.

Colours can be classified as follows:

- Cool and warm – Colour temperatures affect both psychologically and perceptually. They help determine how objects appear positioned in space.
- Primary, Secondary and Tertiary colours – Prang colour wheel.
- Colour schemes –are descriptions of colour relationships, for using colour in a proper way. They are based on the traditional colour wheel.

Activity

Observe the dresses worn by your friends in the class. Note down the colours used.

III Texture

Texture is the element of design that describes surface appearance and feel understood by sight as well as by touch. It also means the appearance of the fabric. It is quality of roughness or smoothness, dullness or glossiness, stiffness or softness. Some words to describe the texture of fabrics are: rough, smooth, dull, shiny, firm, crisp, fuzzy, bulky, dull, etc.

There are two types of textures- structural texture, which is created when fabrics or garments are manufactured, and added visual textures, which come when a design is printed onto the fabric surface. There are various components like fibers, yarns, fabrics and finishes that determine texture.

A. Determinants of texture

a. **Fibers:** Fibers are hair like strands that are made into yarns. Fibers of wool produce soft textures while that of linen produce crisp textures. The short fuzzy

fibers of cotton will produce a dull appearance due to the fuzz. The smooth and long filaments like silk fibers and synthetic fibers make fabrics that are shiny, smooth and cool to touch fabrics.

b. Yarn: Yarns produced from fibers that are twisted in different ways. A yarn which has a low twist will produce a shiny texture because the natural gloss of fiber is not lost in the twist, where as a highly twisted yarn gives a rough texture. Novelty yarns that are looped or coiled in manufacture of yarn create interesting surface contours too.

c. Fabric: Fabric is constructed either by weaving, knitting, felting, bonding, crocheting or braiding techniques. Often the construction of the fabric determines the texture. A satin weave of loosely twisted yarns produces shiny textures whereas knits absorb light and are dull textured.

d. Finish: Finish is given to fabric after it is constructed. Finish like sizing gives stiffness, moire adds shine and watermark design to the fabric. Calendaring gives shine to the fabric, singeing makes the surface smooth and napping makes the fabric fuzzy.

B. Effect of Texture on colour

Colors generally seem lighter on a shiny surface than a dull one.colors from "textured and wrinkled" fabrics seem darker because of more shadows and colors on fuzzy surface mix with fiber highlights and shadows, dulling them slightly. Colors on firm, smooth surfaces seem flat.

C. Effect of texture on physical proportion:

1. ***Smooth, Flat texture*** makes people look smaller. They are suitable for almost all figures and body types. They can hide some figure irregularities because they can hold their own shape.

2. ***Rough textures*** tend to subdue the colors of fabrics. Sheer fabrics also tend to do the same as the skin of the wearer is seen through them.

3. ***Soft and clingy fabrics***: Fabrics that are soft and drapablecling to the body and show every contour and reveal body irregularities. Their use should be limited to those people who wish to reveal their body. Addition of lining to a garment makes it drape better (Fig 1.5).

4. ***Stiff fabrics – bulky fabrics***: They hide body irregularities. Exclusively stiff fabrics appear to add and weight to the body. Persons, who are average,too tall in height, having average or thin body, are benefited by them while small physique persons look dwarfed. Overweight people look heavier because these fabrics stand away from the body, creating the illusion of additional thickness (fig. 1.6) A moderate amount of stiffness is advantageous for overweight people as it does not cling and reveal the exact contours.

Fig: 1.5 Illusion of soft and clingy fabrics withand without lining

Fig.1.6 Illusion of material thickness

5. ***Shiny textures – dull textures***: Shiny texture reflects light and make the person wearing them appear larger. These textures are suitable for all body types, provided they do not

possess other qualities such as bulk, softness and crispness that would contribute undesirable characteristics. Textures that are not extreme – very thin or thick, very soft or stiff or very shiny are to be chosen.

D. Proportion of textures in dress

The scale of textures should be chosen in relation to the size of the person wearing them. A contrast in texture of the dress will emphasis the form. A small sized body wearing large scale textures can even get lost in the textures. On the other hand, pettiness is emphasized by the large-scale texture. Very heavy people who wear large-scale texture will appear heavier because there is repetition of size.

Added visual texture can affect the apparent size of the wearer just as structural texture does. If the print designs are large and bold, the structural design will become secondary to the print. Large, bold patterns emphasize the area where they are used and increase the apparent size of the wearer. Good structural and added visual textures must be planned and organized in interesting ways.

Activity

Touch the fabric you are wearing as well as your friend is wearing. Note down the feeling you have perceived after the touch.

Collect some pictures of textures or fabrics of different textures and create an album

IV. Shape

Shape is flat space closed by a line and in clothing, it is defined as a flat, two-dimensional area enclosed by a line. When both ends of a line meet to surround space, the line forms a shape. Shapes have both physical and psychological effects based on the lines surrounding them. Space within the shape and separating the shapes also has an effect. The word “shape” usually suggests geometric shapes and there are many shapes such as flat ones with equal sides – square, circle, pentagon, hexagon, and octagon, with unequal shapes such as oval, triangle, rectangle, diamond; equal side’s three-dimensional shapes such as sphere and cube. But pure forms are rarely seen in dresses; however, the garment shapes suggest these forms. For e.g. Flared skirt is visualized as a cone or a pant legs suggests tubular shape.

Shapes of unequal proportion such as oval or cone can create a visual interest in dress with the unequal proportions emphasizing in that direction. A short midriff yoke in a dress shortens and widens that area. Shapes with diagonal edges such as triangles and trapezoids, and parallelograms provide dynamism in dress but are less stable. Shapes with unequal sides of three dimensional natures is called form-cylinder, cone, pyramid, bell, dome barrel, box etc. forms are generally created by combining two or more shapes. A form is a shape that has three dimensions:height, width, and depth.

Visual effects of shapes

The visual effects created in the dress by the use of different shapes can affect the physical appearance and the mood of the wearer.

- They can add or reduce the length, width, and weight of the person which can be achieved by placing seams, pleats, armsyce, necklines and waistlines at appropriate places on the garments.
- Garment styles such as dome shaped skirt can conceal heavy thigh or short leg length i.e., shapes can be used to camouflage the undesirable features of the human form.
- Close fit garment styles can help to highlight the desirable features of the person but they can also enlarge a person so they have to be used carefully.

Incorporating shape in dress:

Shapes like Square, circle/oval, triangle, diamond, teardrop, and trapezoid can be introduced into dresses structurally by means of pockets, yokes, collars, necklines, and decoratively with the help of pattern on the fabric, trims and other means of decorative work such as cut work.

Forms such as sphere, cone, box, dome etc. canbe introduced structurally into garments through incorporation of puff sleeves, skits, lehnga, and formal gent's suit.

Some general guidelines to be followed in introducing the above are

- There must be balance between the structural, functional and decorative aspect of design.

- There should be harmony between various proportions and with the whole garment

- The shape should not be either too concealing or revealing but should help to highlight the desirable features of the wearer.

1.2 Principles of Design

Principles of design are guidelines for the use of the elements of design to create attractive garments. They are used for creating, discussing and evaluating garment designs on and off the individual. In order to arrange the elements of design well, principles like balance, proportion, emphasis rhythmand unity/harmony are essential.

1. Balance

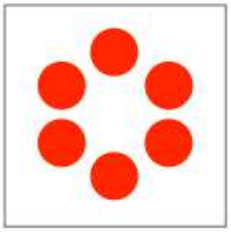
Balance means pose, equilibrium, stability and security. The average human body is visually symmetrical which means that the body seems to be same on each side of a central line. When important details or decorations are designed for a dress, they should be grouped

in such a way that there seems to be equal interest or weight on each side of an imaginary center. When the design elements are in balance, a pleasing harmony is established. Balance in garments is produced by structural parts and by added decoration.

A. Types of balance:

There are three types of design balance in design- formal balance that is encountered in almost all the garments, which are simple in design: informal balance which is difficult to achieve, compared to the formal balance and the radial balance, which is mostly found in areas of necklines. The following explanation gives a bird's eye view of the types of balances and the means of achieving a harmonious outfit using them. The types of balance are shown in fig. 1.7

Symmetrical Balance



Radial Balance

Asymmetrical Balance

a Formal b. informal c. radial

Fig. 1.7 Different types of balance in dress

a**.Formal balance**: It is also called symmetrical balance. Symmetrical balance is mirror image balance that occurs when identical objects are equidistant from a center point. It is easier and safe to create but may not be as interesting as informal balance. A garment with formal balance can be made more interesting using unusual colour, textures or accessories. This relieves the uninteresting aspect from the garment look. Colour, texture and cut of the garment influence this balance in creating a feeling of dignity or formality. A dress with formal balance may emphasize body irregularities as the eye judges or compares one side of the body with the other. (Fig.1.7 a)

a. Formal

b. Informal

c. Radial

b**. Informal balance**: Informal balance occurs when objects or elements of design are arranged on either side of a center are equal but not identical in all aspects. Informal balance is more a visual impact rather than exact distribution of physical weight. More freedom of expression is possible with this balance, because it is exciting and has an element of interest. But such design is more difficult to construct, is more time consuming as the parts of the garment are to be assembled separately which adds to the cost of manufacturing. Informal balance can be used to correct the appearance of body irregularities as comparison of both the sides of the garment is not done by the viewer. (Fig: 1.7b)

C. Radial balance: Radial balance occurs when the major parts of the design radiate from a central point. Pleats, seams, gather, darts, or motifs radiate from the focal point creating a sunburst effect. This type of balance is found frequently in necklines. Due to the intricacy of construction it is found only in expensive clothing (Fig:1.7c)

II V.Rhythm

Rhythm is an important principle of art created by repeated use of the design. It has a feeling of organized movement as the arrangement of the design elements make the eye move easily over the apparel. Though repetition of pattern is required, it is not always very essential.

A. Rhythm in clothing design:

Rhythm can be created in a garment with repetition, gradation, transition opposition or radial arrangement of various parts of design and also the fabric design.

a. Rhythm through repetition

Repetition or regular repeats of motifs of design, shapes, buttons, tucks, pleats, laces, edgings, colour, textures, fabric designs etc. Parts of the garment having the same shaped edges like squared, rounded, or scalloped edges also create repetition. When colours are used in repetition a good effect can be created if the colours are distributed in an interesting way (fig: 1.8a)

Smooth undulating lines imparts a peaceful and calming effect while lines with sharp points and jagged create an exciting rhythm more suitable for evening wear. Care should be exercised with this type of rhythm as it may disturb and subdue a garment design. Pleats, tucks, stitching folds create abrupt rhythm. Trimmings like beads, buttons lace etc. create a variety of rhythmic effects in a garment.

b.Rhythm through Progression/gradation

Rhythm is also created by progression or by gradation. Gradation implies gradual increase or decrease of similar design elements. For e.g.colour from light to dark or textures from fine to coarse; shapes from small to large, and lines may range from thin to thick or vice versa. A gradual change generally provides continuity, giving a feeling of movement. Increasing or decreasing changes in sizes of motifs buttons trims, ruffles, fabric design also create rhythm (Fig 1.8d)

a repetition b transitionc radiation d gradation

Fig 1.8 Rhythm in clothing design

c. Rhythm through transition

Transition is the process of changing from one style, condition, position etc. to another without any break point during modification. The curved lines of transition cause the eye to change direction gradually rather than abruptly. Transitional lines and shapes lead the eye

gracefully and easily from one area or direction to another. It is found in dropped shoulder designs, puff sleeves and cap sleeves. Transition can also be achieved by using scarves, shawls, ruffles and gathers in an outfit (Fig 1.8b)

d.Rhythm through radiation

Rhythm by radiation creates a feeling of movement in different directions. This organized movement originates from a central point of gathers, folds, tucks, darts, pleats and lines. Direction of radiation may be in a similar or one direction, opposing direction or both the directions (Fig 1.8c)

e. Rhythm by continuous line movement:

This type of rhythm is obtained by flowing lines of trims, bands of colour, fabric designs etc., which make the eye move in a continuous line bringing about harmony. Rhythm is broken when lines, trimmings, or fabric designs are not matched at the seams or at other construction points. Fabric's designs with widely placed motifs may lack rhythm.

The structural seams incorporated by means of darts, edge finishing, gathers, pleats etc. create graceful rhythm in a garment. Pleats or tucks produce regular rhythm, scalloped edges in tiered skirt produce graduated rhythm and shirring gathers, smocking produce random but intricate rhythm in a garment. Besides, this the applied means of decoration like ruffles, laces; embroidery stitches, etc. incorporate different types of rhythmic movements in the garment.

III. Proportion

Proportion is sometimes called scale. Proportion includes the relationship of height, Width, depth and surrounding space of each design. When all the parts work well together, the garment is well, proportioned. Unequal parts are more interesting than when all areas are exactly equal in size. Also an odd number of parts, such as three, are more interesting than an even number such as two or four. Of course, fashions that make the body look distorted, or out of proportion, are sometimes referred as popular fads too. Proportion in relation to clothing design and to that of body conformation is important aspect to be considered to create a well-proportioned garment style. Figure 1.9 shows garment styles in different proportions.

a. **Proportion applied to clothing design:** The golden means equations are used to produce garments that may be divided visually into 3:5, 5:8, and 8:13 horizontal sections. This is because, the body proportions have 3/8 of total figures from the waist to top of the head and the remaining 5/8 of the body is from the waist to soles of the feet. To coordinate with this, most outfits are divided unequally. These divisions may not be measured exactly and accurately, but they are within certain limitations, because we accept certain variation if they are pleasing to the eye.

b. **Proportion and body conformation:**The human body size can be divided into three general categories – small, medium and large. The body size should be identified for using it as a guide in selecting all clothing and accessories. The small person should limit himself or

herself to items that are of small or medium scale. The middle or medium sized person may select from small, medium or larger scale. The large person should be limited to the large or medium scale.

Fig 1.9 various proportions in dress

Parts of apparel, such as yokes, collars, and pockets, must be the right size for the total design and for the wearer. A tiny pocket would look out of proportion on a large, heavy overcoat. Similarly, details such as buttons and trimmings should also be related to the overall size of the garment.

When a person wears clothing that is too large in fit, texture and fabric design and also selects accessories that are too large, the relationship of size becomes out of proportion as the large built individual is visualized in contrast to the small scale of the clothing and accessories. A person of medium size has more freedom to select clothing and accessories in a wider scale range.

In considering the proportion of an outfit, one should therefore always use the body as the guide for clothing purpose. It is most pleasing to divide a garment or outfit at natural body division such as the chest, waist or hips than at any other area.

IV. Unity / Harmony

Unity is also called harmony in design. It is a pleasing visual unity, the relationship among all parts within a whole. When a design has unity, it gives an overall impression, a feeling of belongingness to the composition that attracts and holds the attention of the observer.

Shapes and spaces created by pockets, collars, cuffs, sleeves etc. will harmonize if they are soft curved or straight and angular in accordance with the major forms of garments. By using monochromatic and analogous colour schemes one can achieve harmony of colour in a dress. Textures, which gently move from clinging to fluid folds, introduce harmony of texture.

However complete similarity in agarment, be it colour, texture, shape or space may create boredom. To avoid this monotony a small area in contrast colour or a garment part cut in contrast of texture can often add interesting element in the design.

A. Unity in clothing design

Harmony between shape and form is necessary for good design. The agreement among functional, structural and decorative design level is essential in order to have harmony in the garment design. This means that occasion, climate, size, gender, age, personal coloring, life style and personality of the wearer should be considered while designing the garments (Fig 1.10)

Fig 1.10 Harmony and disharmony is dress designs

V.Emphasis

There is some portion in every dress which is the center of attraction. This portion is called point of emphasis. Emphasis is concentration of interest in one area called eye arresting area of a design that acts as the center of attention. It is the center of attention of an outfit. This implies that some areas require subordination in order to emphasize some areas. Without any such center of interest, an outfit looks unplanned and monotonous too. When many focal points are created in a dress, a jumbled, confusing design results. So, it is best for

instance, to leave the cuffs, hemline and other areas of a dress fairly plain if the neckline is being emphasized.

Placement of emphasis should not be in any area where the individual wishes. The face or personality areas are more important and should be emphasized most often. This is the part of the person that is most unique and individualistic and so one should make use of this area. Emphasis at this personality area may be achieved by colour and texture contrasts, necklines, jewelry, scarves, hats, hairstyles, and makeup. Care is exercised to see that only one area is emphasized as discussed earlier.

Hands are emphasized by long sleeves, especially when cuffs are linked by bracelets and rings and even by well-manicured nails. Hands that are dirty or with chewed nails can bring negative emphasis to this area. Similarly, legs and feet are made dominated by unusual hem lengths, design details at the hem, textured or colored hosiery and even elaborate footwear. Parts of the torso, such as the waist and hips become areas of interest when garments lines or ornamentation fall at these areas.

a. Creating emphasis in garments

1. Emphasis may be achieved by grouping rows of tucks, gathers, ruffles, buttons or trim in one area, or by concentration of jewelry such as rows of beads, chains or pins (Fig1.11).

Fig 1.11 Creation of Emphasis in Dress

2. Shapes of collars, sleeves, pockets, jewelry,oversized buttons, belts and trims can be used to create local interest with usual designs. Unusual and different fabric designs and texture may attract focus of attention, provided the garment design is simple, and not competing with fabric design or the texture.

3. The placement of decoration on a plain, contrasting background permits the decoration to be dominated. Trims, embroidery appliqué, jewelry, buttons and belt, buckles when used ona contrasting background are emphasized and become areas of interest.

4. Contrast of colour, lines shape, and texture will also create emphasis. Using contrasts too many times often lose their impact in the design.

5. Contrasts of shapes is more strongly emphasized when they differ from the background. Yokes, collars, cuffs and shapes will be more noticeable when their edges are outlined in a contrasting trim.

6. Emphasis can also be achieved by progression in ruffles, contrasting bands, buttons and other trims

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1.3 Summary

There are different components of elements of design such as line, form, colour, texture which greatly influence the clothing decisions. Elements create psychological effects and physical effects which should carefully balance for an appropriate appearance. One should know both the potentials and the limitations of each element for proper usage in a design. Understanding how and why a person responds to the various elements and principles of design and knowing how to control and use them effectively for a good design is an important aspect in designing.

Terms Introduced

Design element: The basic unit of visual design

Form: A three-dimensional object created by combining two or more shapes.

Texture: Texture refers to how the surface of something looks and feels, tactile sensation

Illusion: Are visually perceived objects and images that differ from reality

Structural design: It is the frame work or essential form of a garment formed by stitching pieces together, like collar, cuff, yoke, pleats, etc.

Decorativedesign: Design created on the surface of fabric either by painting, printing, embroidery or any other technique.

Repetition: It is the recurrence of the feature

Gradation: The feature does not change as such but one aspect of the feature change in the next repeat.

Transition: The process of changing from one style, such that it appears gliding gradually rather than jumping from one place to other.

Rhythm: A regular recurrence of elements or motifs in a measured way.

Activity

Students should be encouraged to collect various dress design figures and evaluate in terms of elements of design individually or in groups.

Test your understanding

State True or False for the statements below

1. Lines can be categorized by type, direction and application (T/F)
2. Restrained curve highly emphasizes the curves of the body (T/F)
3. Jagged lines give a feeling of jerky, busy, excited effect. (T/F)
4. Horizontal lines give the impression of more width and less height (T/F)
5. Lines spaced far apart make the figure look taller than they are. (T/F)

II.Test your understanding

State True or False for the statement below

1. Colours generally seem lighter on a shiny surface than a dull one. (T/F)
2. Smooth, flat textures make people look larger (T/F)
3. Shinny texture reflects light and make the person wearing it appear larger (T/F)
4. A yarn which has a low twist will produce a rough texture. (T/F)
5. The smooth and long filaments like fibers make fabrics look shiny, smooth and cool to touch fabrics(T/F)

III. Test your understanding

Fill in the blanks with correct answer

1. Organic shapes are also known as _____ shapes.
2. Shape is the outer edge or contour of an area enclosed by _____
3. Form is defined as a three dimensional_____
4. Straight tubular shapes add _____ to the person
5. Human made shapes and accidental shapes are called_____

IV. Test your understanding

State if the following statements are TRUE or False

1. Informal balance is difficult to achieve than formal balance. (T/F)
2. When pleats, seams, gathers, darts are used in a dress it is formal balance (T/F)
3. Rhythm is an important principle of Art created by repeated use of the design (T/F)
4. Rhythm can be created in a garment with repetition, gradation or transition (T/F)
5. A dress with formal balance may emphasize body irregularities (T/F)

V. Test your understanding

Fill in the blanks with correct answer:

1. Unequal parts are more interesting than when all areas are exactly _____ in size.

2. Emphasis is concentration of interest in one area called _____area of a design.

3. Harmony between shape and _____ is necessary for good design.

4. The human body size can be divided into three general categories small _____ and large.

5. Proportion is sometimes called_____.

Model Questions

Short Answer Type Questions

1. How are lines in garments categorized?
2. What are the various types of illusion created by line in dress?
3. Write about the application of line in garments
4. According to directions, what are the various types of lines?
5. Differentiate between form and shape.
6. Define line. How is it useful as an element of design?
7. What are the determinants of texture?
8. How does texture effect colour?
9. Write about effect of texture on physical proportion?
10. How should be the proportion of textures in dress?
11. What are the various types of texture?
12. What are warm and cool colours?
13. What are the characteristics of colour?
14. What are the principles of design?
15. What are the different types of balances that can be used in dress design?
16. How is informal balance achieved in a dress?
17. What is meant by radial balance?
18. Formal balance is easy to achieve. Explain.
19. What are the different types of rhythm that can be created in garments?
20. Write about the proportions suitable for a small person.
21. Where emphasis should be placed in garments?
22. What are the physical effects of harmony?
23. Write about the methods of creating rhythm in clothing design

Long Answer Type Questions

1. What are the various Elements of design that help in dress design?
2. What is texture? What are the different textures used in creating illusion in dress design?

3. What are different types of lines used in dresses? How do they effect in dress designing?
4. What are the visual effects of shapes in a dress?
5. Briefly describe the importance of elements in dress
6. Explain different methods to create rhythm in design. Support with suitable illustrations.
7. What are the different types of balance used in clothing?
8. How is rhythm created in dresses? Give examples for each variety.
9. What is proportion? How is it achieved in clothing?
10. How are art principles useful in clothing design? Explain with suitable dress designs.
11. How can harmony be introduced into garments?
12. What is the use of emphasis and how is it created in clothing design?

Answers

I. Test your understanding:

1. True 2. False 3. True 4. True 5. False

II. Test yourunderstanding:

1. True 2. False 3. True 4. False 5. True

III. Test your understanding:

1. Natural 2.Lines3.Shape 4.Height 5. Non-objective

IV. Test your understanding:

1. True 2. False 3. True 4. True 5. True

V. Test your understanding:

1. Equal 2. Eye arresting 3. Form 4. Medium 5. Scale

UNIT 2

Colour and Colour Theory

Structure

Learning Objectives

After reading this lesson the student will be able to

- Recognize the significance of colour
- Comprehend the properties of colour and its dimensions
- Follow the theories of colour and the differences
- Gain knowledge about different colour systems in vogue
- Differentiate colour based on characteristics
- Acquaint with the different schemes of colour and its physical effects
- Understand the importance of colour in dress design
- Visualize the effects of colour in dress
- Design dresses based on the qualities of personality and interaction of colour

Unit Preview

Colour is the first attraction in a garment. There are two colour systems used by designers and various color schemes that aid in the creating a good garment design. This chapter deals with different colours their classification, properties, and different schemes. It also gives an idea of how well to use colour in designing.

2.0 Introduction

Colour is the most exciting design element as it is the first thing noticed in a garment and attracts consumers. Colour is a property of light, a sensation, which occurs when light enters eyes. Colour enables one to express oneself, to affect the feeling, and also reveal the personality of the wearer. Colour has the power to thrill and shock, irritate or soothe, attract or repel**.**

Objects appear colored because their surfaces absorb certain parts of the visible spectrum of light and reflect other parts back to our eyes. For e.g. if an object appears blue, it is because the object absorbed all other colored light and reflected only blue colour light. Visible spectrum of light or white light contains colours from Blue at one end of the spectrum to Red at the other end. The ends of this spectra band are bent and joined to form a colour wheel.

2.1- Properties of Colour / Colour Dimensions

Colour has three distinct properties hue, value and intensity/saturation

a. Hue

It is the family name or quality of a colour, which distinguishes one colour from the other. It is accurate description of a colour. Hue is the other word used for colour. Some of the hues names are red, orange, yellow, green, blue, violet, magenta, cyan etc.

b.Value

Value is concerned with the lightness or darkness of a colour, the property which is exhibited by all colours. The extreme values are black and white. Some colours like yellow are naturally light. Some, like violet, are darker. All hues can be made in all values. Adding white paint will make any hue lighter. The resultant hue colours with white are called tints. Adding black paint will make most hues darker and adding black to a hue results in shades.

c.Chroma /Intensity

Intensity is brightness and dullness of a colour. The colours, on the colour wheel are of full intensity. When grey or its complement colour is added it becomes less intense. A dull colour is unsaturated or low in intensity. A colour without any brightness (on hue) is achromatic (black, white and / or gray. According to intensity, colours are called as very bright, bright medium, bright, bright medium, medium dull, dull or very dull). On the other-hand black and white are neutrals.

Activity:

- *Look into the nature and select a flower and try to describe the characteristics of colour in it*
- *Conduct a small experiment with three transparent red, green and blue coloured papers and place one on top of another. Use a torch light and let light pass through all three paper layers at a time and record the observation*

- *Similarly take three or more water colours and start mixing first any two, add another colour to this mixture, keep on adding every colour. Record your observations.*

2.1.1Colour Wheels

A Colour Wheel is a conventional arrangement of hues in a circle to demonstrate their relationships. This wheel can be used as a guide to choose and combine colours.

A. Munsell Colour System

This system is based on a unique colour-solid arrangement, which more accurately demonstrates hue, value and intensity of colour. In this system, a colours hue is given a number /letter destination, which locates it on the Munsell Colour Wheel. Paint, ink and colored paper and other manufacturers often use this system. There are five primary and five secondary hues in this system. The primaries are red, purple, blue, green and yellow. Hue, value and chroma are then rated with numbers. Colours can be very accurately described using this system. A three-dimensional model using Munsell's is called **a colour tree.**

B. Prang or Brewster

By 1831 Brewster laid the groundwork for what has become known as the Prang theory. Its structure is simple, straightforward and practical. The most common colour wheel is based on the theories advanced by Louis Prang in 1876 and is commonly known as the Prang colour wheel. In most theories the hues on the colour wheel can be grouped as follows (fig2.1)

It is a standard 12-hue wheel with 3 primaries, 3 secondaries, and 6 tertiary colours. Prang value has 9 steps from white to black and 7 steps in intensity from a full primary at the tip to its full complement secondary at bottom.

Primary Hues: These are red, blue and yellow in the Prang colour system. They are referred to as primary because they cannot be made by mixing other hues and all other colours can be made by them. The three primary hues are placed at equal distances from each other on the colour wheel.

Fig. 2.1 Prang colour System

Secondary Hues: The three secondary hues are orange, green, and violet (purple). They are made by mixing equal amounts of two primary hues together. They are found halfway between the primary hues on the colour wheel. Orange is made by mixing red and yellow. Green is made from equal amounts of blue and yellow. Violet is a combination of red and blue.

Tertiary Hues: Intermediate hues (sometimes called tertiary hues) result when equal amounts of adjoining primary and secondary colours are combined. When naming them, it is customary to state the name of the primary hues first e.g. red-orange is the tertiary between red and orange. Intermediate colours are blue-violet, blue-green, yellow-orange, red-range, and red-violet.

c. Warm and cool colours

Colour creates a feeling of warmth and coolness when looked at. The colour wheel can be divided into warm and cool sides. The colours on the red side of the wheel are said to be **warm** because they are associated with warm phenomena. Warm colours are red, orange, and yellow. They appear to be hot like the sun, or like fire. Orange is the warmest colour. Warm colours give a feeling a gaiety, activity, and cheerfulness and lively mood. Warm colours appear to advance, or to come toward the observer. They make the body look larger. White and light colours also make objects look larger.

They green side implies **cool** phenomena. Cool colours are green, blue, and violet. They remind us of water or the sky. Blue is the coolest colour. Cool colours give a feeling of

quietness and restfulness. They suggest a subdued mood. If overdone, they can be depressing. Cool colours appear to recede, or to back away from the observer. They make the body look smaller. Designers often use cool colours for garments in large sizes so that people look smaller.

2..2 Colour scheme/ Harmonies

Colour when combined should be used at the right proportion or else they clash and give an awkward appearance rather than being beautiful. Colour schemes are the ways that colours are used together. An understanding of well-known colour schemes helps us to achieve different results by using different combinations of colours. The six basic colour schemes are as follows:

a. **Monochromatic colour scheme:** A monochromatic colour schemeis a one-colour plan that uses different tints, and shades. Neutrals such as black and white can be added to a monochromatic scheme for contrast and interest.

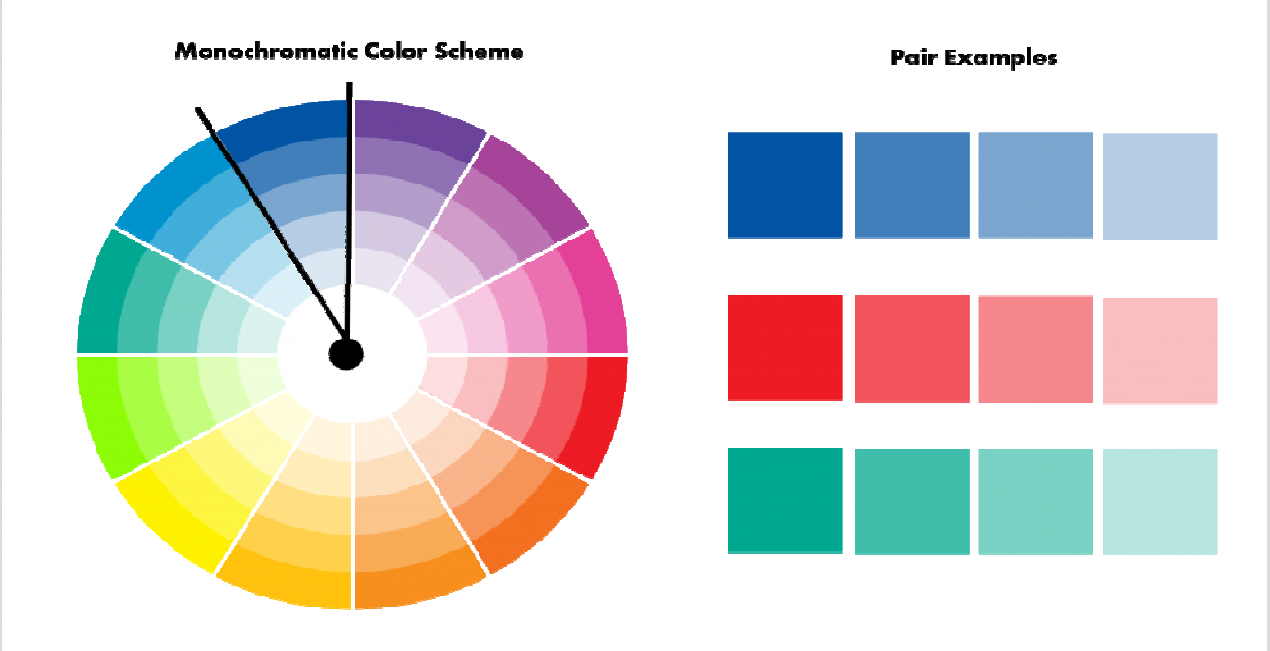


Fig 2.2 Monochromatic colour scheme

b. Analogous: They all have one hue in common so things can't get too wild. An analogous colour scheme uses neighboring, or adjacent, colours on the wheel. It is sometimes called a related colour scheme since two or three "related" colours are used. The combination of yellow-green and green is an analogous scheme with three hues. In nature, the yellow, orange and red of autumn is an analogous colour scheme. Also, the blue, aqua, and green of sky, water, and grass is analogous. (fig2.3)

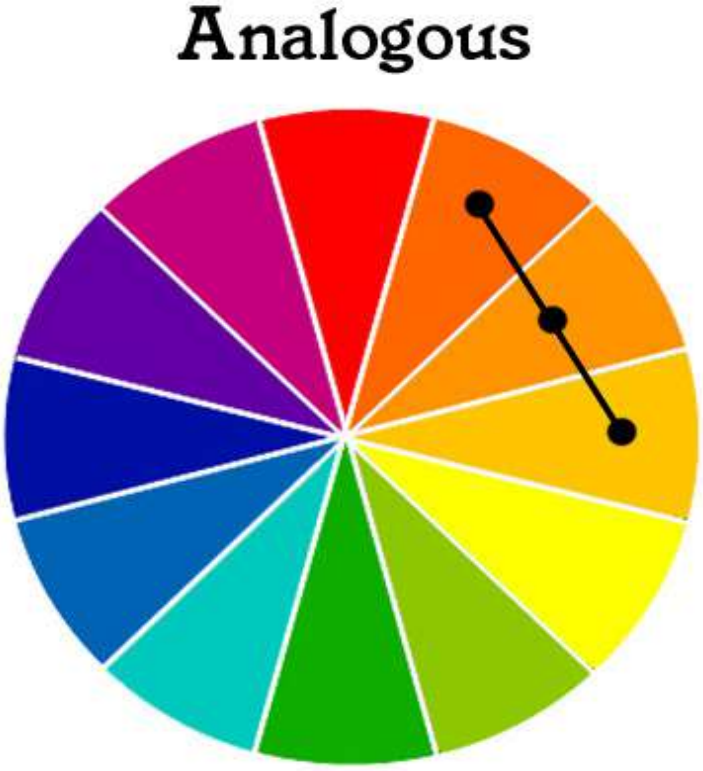


Fig 2.3 Analogous colour scheme

c. Complementary: This scheme uses colours that are opposite on the colour wheel (complements). Complementary colours are across from each other on the wheel. They have great contrast. In fact, the colours look even brighter when they are used side by side. Examples are blue and orange, violet and yellow, and red and green. Worn together in full strength, these colours can give a real jolt. However, when used in tints and shades, they can be sophisticated and pleasing. A soft tint of one is usually attractive with a deep shade of the other (fig2.4).

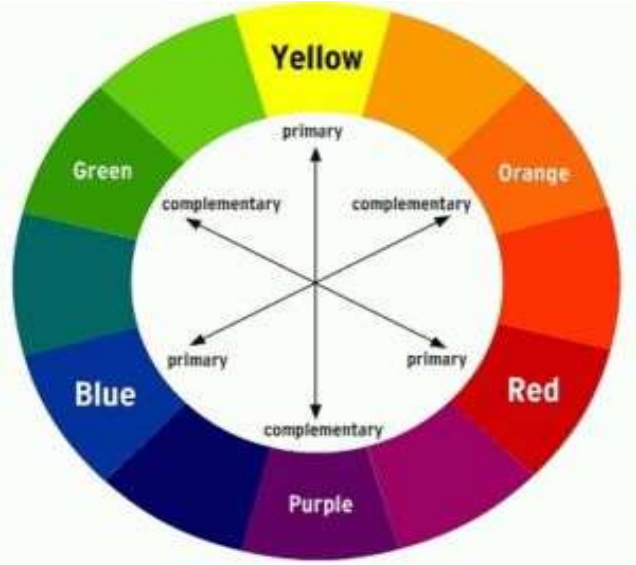
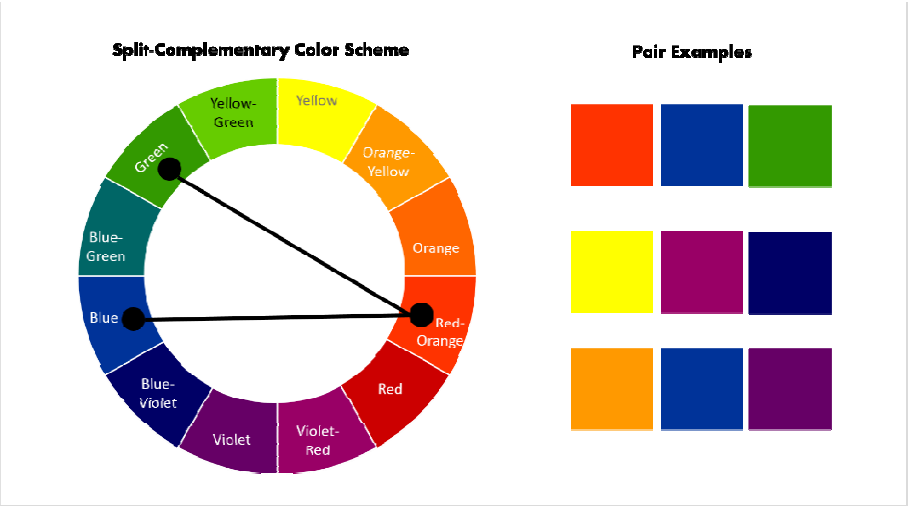


Fig 2.4 complementary colour scheme

C. **Split-complementary colour scheme**: A split-complementary colour scheme uses three colours. It combines one colour with the two colours on the sides of its complement. First choose a colour and find its compliment on the colour wheel and then take colours on either side of the compliment. For instance, blue might be used with yellow-orange and red-orange. This is also a bright colour scheme to be used with care in your apparel. (Fig2.5)



. (Fig2.5) split complimentary colours

e. Triad colour scheme:A triad colour scheme combines three colours, which are of equidistant on the wheel. Examples are red, yellow, and blue, or purple, green and orange. It has a great deal of contrast. To soften the contrast, one may choose to combine pleasing values and intensities (Fig2.6)

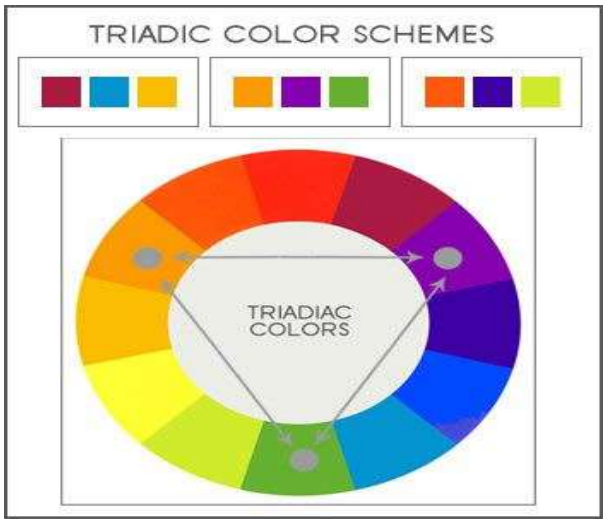


Fig 2.6 Triad colour schemes

Activity

1. *Draw a dress design and fill it with different colour schemes and observe the physical effects the schemes have created.*

2.2.3 Use of colour in designing

Knowledge about colour and its use is important in achieving awell-dressed appearance. If not used well or combined well, colour can cause apparel to look too gaudy or very dull. Colours in clothing are usually best used according to the following.

- Black is good for formal wear. It tends to be sophisticated.
- Brown is casual, natural and informal
- Navy looks good on almost everyone and is good for sportswear or classic styles.
- For a tailored image beige and grey are to be chosen.
- White looks good with all other colours. Off-white is better for most people than pure white.
- Red, green, and blue have many tints, shades and intensities which make these hues suitable for almost all occasions.
- Yellow is good for causal, fun clothes, but it is not pleasing for many skin tones. Bright colours are fun for active sportswear or as accents with neutrals.

Using a colour with a neutral makes the colour appear brighter. Also, white and grey look brighter when placed beside black. Clothing outfits are generally more attractive if they do not have equal areas of light and dark. In most cases colours in clothes seem to be better balanced if light ones are used above dark ones. Colours of contrasting value are often exciting when used together. Extreme contrasts makecolour look brighter.

2.1.4. Visual effects of colour in dress

Colours react with each other and the effects they give depend on how light, dark or strong the colours are. Dark, cool and dull colours make objects appear smaller than the same object in warm, light or bright colours. Warm and bright colours make a form seem larger due the colours advancing characteristics. Such colours are white, yellow, orange and red.

A single colour for an entire outfit makes a person look thinner and taller. When combining two colors in an outfit, special precautions are needed. Sharply contrasting colours appear to shorten the body. This effect can best be used for a very tall person, dividing the top and bottom of the dress.

When two hues of identical tone are used together, they cause visual 'clashing' colours appear to jump around because they both compete equally for attention. This effect is reduced by changing the tone of one or both the colours. In most cases use one colour for a large area and another colour or two for smaller areas. Students of Apparel design need to perceive the light and dark shades of a hue that appear on garments when folded.

Summary

Colour is also an element of design and it has a strong influence on humans. The properties of colour and the different colour wheels aid in identifying their role in garment designing. Different visual effects are created with colour and colour schemes and the designer has to consider these effects and use colour appropriately and wisely in order to create an effective and pleasing yet attractive design.

Terms Introduced

Phenomena -an observable event or occurrence

Cyan- generally dark blue colour or any colour in the blue-green shade

Classic styles – traditional style that always exists even fashion changes frequently

Beige – light brown colour

Activity

Collect some pictures from magazines and paste them according to colour characteristics and schemes

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I. Test your understanding

State if the following statements are true or false:

1. **Colour is the property of light. T/F**
2. **The lightness or darkness of colour is called hue. T/F**
3. **A colour without any brightness (no Hue) is chromatic. T/F**
4. **White light contains colours from Blue at one end of the spectrum to Red at the other end. T/F**
5. **An object appears blue, because the object reflected only blue colour light. T/F**

II. Test your understanding

Fill in the blanks with correctanswers:

1. **A colour wheel can be used as a guide to choose and _____colours.**
2. **Paints, ink and colored paper and other manufacturers often use _____ colour system**
3. **The standard 12-hue wheel was developed by _____**
4. **There are _____ primaries, and _____ tertiary colours in the Prang colour wheel.**
5. **The colours on the red side of the wheel are said to be _____colours**

III. Test your understanding

S.no.	A	B
1.	Single colour in a dress	Makes person look larger ( )
2.	Dark, cool and dull colours	To be used with care ( )
3.	Light warm and bright colours	Uses adjacent colours of the wheel ( )
4.	Monochromatic colour scheme	Person looks thinner and taller ( )
5.	Analogous colour scheme	One colour plan ( )

6. Split-complimentary colour scheme Objects appear smallest ( )

Model Questions

Short Type Questions

1. **What are the properties of colour?**
2. **Which are the colours classified as warm and cool colours?**
3. **What are the primary and secondary colours of the Prang colour chart?**
4. **How many of colours are there together in a Prang Colour Chart?**
5. **Write about the use of colour in designing?**
6. **Which are the colours that make a person appear thin and fat?**

Long Answer Type Question

1. **What are the various visual effects created in a dress by colour?**
2. **Describe Prang colour chart with proper illustrations.**
3. **What are the different major colour harmonies?**
4. **What does Munsell colour system describe about colour?**
5. **Write about colour theories followed in designing dress**
6. **Draw Prang colour chart and explain how colours are achieved.**

Answers

I. Test your understanding:

1. True 2. False 3. False 4. True 5. True

II. Test your understanding:

2. Combine 2. Munsell 3. Prang 4. 3,6 5. Warm

III. Test your understanding:

1. (3) 2. (6) 3. (5) 4. (1) 5. (4) 6(2)

UNIT 3

Elements of Fashion

Structure

Learning Objectives

After reading this unit, the student will be able to

- Understand fashion and its classification
- Gain knowledge about the terminology used in the fashion industry
- Acquaint with the cyclic changes fashion undergoes over a period of time
- Know about the flow of fashion from one segment of population to the other
- Differentiate between different silhouette types

Unit Preview

Fashion can be classified according to the type used. Different terminology used in the fashion world aids the students to understand the scenario. Fashion cycles and theories of fashion help the students to identify how each style would change over a period of time. Silhouettes and their types allow the student to understand the description of garment and in identification**.**

3.0 Introduction

Fashion is a complex subject-one that intrigues andfascinates and has been studied throughout history. In the study of fashion today, certain words and phrases are used over and over again for ex; HIGH FAHION,MASS FASHION STYLE,DESIGN, TASTE, CLASSIC AND FAD

Fashion is something we deal with every day. It is a language which tells a story about the person who wears it. Fashion is always changing, sometimes strongly and sometimes extremely seductive. It has the power to transform an image and make a social statement. Fashion on its most basic level is about the making and selling of clothes. It is a classically social phenomenon being born in the fifteenth century. It can be viewed as an art because it requires a lot of creativity to make the products. Fashion involves the clothes we wear, the way the hair is cut, the accessories that are worn and so on. It has an impact on every stage of life from birth to the end of life.

Definition: The Prevailing mode or style, especially of dress. Fashion is a term commonly used to describe a style of clothing worn by most of the people in a country**.**

3.1 Classification of Fashion

A fashion can be brief or of long duration. Some fashion takes a short time to peak in popularity, others take longer. Some decline slowly other swiftly. Certain fashions fade quickly, others completely disappear. The duration of fashion is very important and critical to fashion designers or concern manufactures.

Fashion is classified into many types such as:

a. **Basic or classic**
b. **Fad**
c. **Popular**

a. The Classic

Classic or basic styles need became completely obsolete, but instead remains more or less accepted for an extended period. Such as, salwar kameez and sari. These are the silhouettes that exist year after year because they are pleasing and suitable for many figures and occasions. The outfits stay in the fashion scene for a long period of time or may be for years. Their presence is felt irrespective of different fashions existing at a point of time. Almost every wardrobe has some classics in it, and some are mostly classics. Classics are characterized by simplicity of design as well as length of time in fashion. Garments that fall under this category include shirt and trousers, plain or pleated skirts and denims, etc.

b. The Fad

A fashion that suddenly sweeps into popularity, affecting relatively few of the total population and quickly disappears is called FAD. Fad follows the same cycle as fashion

do, but their rise in popularity is much faster, their acceptance much shorter they can also come and go in a single season, fads have been called, miniature fashion.

Fad can be defined as short lived fashion, lasting for a very little time or period acceptable by only a certain group of people. It can be denoted as the style 'born overnight' which grows very quickly in popularity and becomes short lived fashion. This is the trend that is quickly accepted sometimes quickly obsolete. It is often inclined to be extreme, quitegimmicky, and not suitable to all types of personalities. They are just part of what goes to make fashion fascinating.

Fads being in low priced garments and flood the market within a short time. People get tired of it quickly and end using them leading to their abrupt disappearance. The temporary nature of a fad is usually due to its extreme design, extreme silhouettes, strong colours, bright bold prints, exaggerated accessories are typical examples of fad.

c. The Popular

This is the Fashion that is popular everywhere. It is wearable, adaptable to figure types and to age groups, its shape must be such that is can be made excellently from any fabric in any season.

3.2 Fashion Terminology

Students aiming to be in the field of fashion should have a clear idea about the various terms that are prevailing in the industry. Besides familiarity they should be able to distinguish the subtle difference within the terms. Though there is an exhaustive list of terms used, the following are the most important terms that are greatly used in the fashion industry.

Fashion

Fashion is a style that is accepted and used by a majority of group at any one time, no matter how small the group is. Style may come and go but fashion is always present in some form or the other.But it does not mean that every style is in fashion. Style does not become fashion until it gains some popularity and is accepted and it remains in fashion as long as it is accepted. It can also be said that fashion denotes the display of the prevailing and popular style of clothing.

Style

A style is a particular design shape or type of apparel item. It is defined as a type of product that has one or more specific features or characteristics that distinguish it and make it different from other products of the same type. The style of garment is the determined by the distinct features that create its overall appearance. Caftans, Bermuda shorts, Pinafore etc. are all styles of dress.

Garment

Any article of clothing as a coat, a gown etc. an outer covering or outward appearance.

Taper

Diminish or reduce in thickness towards one end.

Classic

A Classic is a style or design that satisfies a basic need and remains in general fashion acceptance for an extended period of time. A classic is characterized by simplicity of design as well as length of time in fashion.

Empire

Empire silhouette, **Empire line**, **Empire waist** or just **Empire** is a style in clothing in which the dress has a fitted bodice ending just below the bust, giving a high-waist appearance, and a gathered skirtwhich is long and loosely fitting but skims the body rather than being supported by voluminous petticoats. The outline is especially flattering to pear shapes wishing to disguise the stomach area or emphasize the bust. The shape of the dress also helps to lengthen the body's appearance.

Silhouette

The silhouette is a shape or outline or contour of a clothing style. It is also called as “shape” and “form”. It is formed by the width and length of the neckline, sleeves, waistline and parts or skirt. Silhouettes always change in fashion. Based on the outer shape they are termed as bell, buck fullness, hourglass, tubular etc. They generally do not change abruptly but evolve gradually from one to another through changes in details.

Avant –grade

Avant-grade clothes are the most daring and wild designs. They are the styles created with original unconventional ideas or techniques with a startling look. They are too “far out” to be considered fashions of the times. Most features of these garments disappear completely after a few years. Avant grade clothes are used to draw attention to the wearer. Avant-grade is generally worn by rock stars on stage which is sometimes followed by the teenagers. One such example is the spiked hairstyles during 1980’s and at present.

Craze

A short-lived current fashion or A short-lived popular fashion; a fad

Couture

Literally means finest dress making in French. The word also implies fine, custom dress design, made to measure for a particular customer. It refers to a group of firms or fashion houses, each with a designer who creates original individually designed fashions. The

designer who often owns the firm is the couturier. Couturiere is the female designer. They have their own couture house and create original designs that are presented in a collection each season primarily aimed at individual or private customers. The designs created by the couturier are known for their beautiful detailing and use of luxury fabrics.

Knock –Off

Knock-Off is the stealing of design ideas, or the use of a design, without the consent of the originator/manufacturer. Designs are generally copied from higher priced garments. They are produced in great volume with lower quality materials and workmanship.

Mass fashions

In contrast to high fashion, mass fashion or otherwise called volume fashion consists of styles that are widely accepted by consumers. A classic may achieve peak in popularity and become a mass fashion. They are sold out in a variety of price ranges at department, specialty, and discount stores. Mass fashion constitutes the bread and butter of fashion industry, as they account on the major of sales in the fashion business. It also allows a variety of fashion looks to be available to all.

Custom

Custom means made for the individual customer. It is also called made-to-order apparel. This is usually done after the customer has seen a sample garment, sketch or picture. Custom made clothing was produced mostly by women of the house prior to the mass production at the factories.

Fashion Illustration

It is an artistic style of drawing a producer's or designers complete or part of collection of samples brought into the store for a limited time to take orders from customers. The garments are exhibited to customers at scheduled, announced showings. It is form of pre-testing that involves a producer's sending representatives to a store for the display of garments.

Ford

A style or design that is produced at the same time by many different manufacturers in many different prices is called a ford.

Fashion Trend

It is the direction in which fashion is moving. This helps the manufacturers and merchants to decide whether to promote fashion to the customer or to abandon it.

Gusset

In sewing, a **gusset** is a triangular or rhomboidal piece of fabric inserted into a seam to add breadth or reduce stress from tight-fitting clothing. Gussets were used at the shoulders, underarms, and hems of traditional shirts and chemises made of rectangular lengths of linen to shape the garments to the body

Ravel

Untangle something. Unravel; fray.

Ric rack

Sometimesspelled ricrac) is a "flat narrow braid woven in zigzag form, used as a trimming for clothing or curtains. “rick rack was used to provide a finished edge to fabric. Made of cotton or polyester, rickrack is stitched or glued to the edges of an item. Its zigzag configuration repeats every third of an inch (about one centimeter) and is sold in multiple colors and textures. Rickrack's popularity peaked in the 1970s.

Sag

Sink, subside, or bulge downwards underweight or pressure or through lack of strength.
to fall down

Trunk show

The show is organized by showing a producer or designer complete or part of collection of samples for limited time to take orders from customers. The garments are exhibited to the customer at scheduled announced showings. It is a form of pre-testing that involves producers sending a representative to a store for the display of garments.

Vent

In garment terms, a vent serves a similar purpose to a slit. They are often in the back seamof a jacket, where they have been inserted to let the shape ‘breathe’.

Wadding

Soft, thick material used to line garments or pack fragile items, especially cotton wool formed into a fleecy layer.

3.3 Fashion cycles

Our desire for new fashions causes garment silhouettes and details to constantly change. The way in which fashion changes is usually described as a fashion cycle. A fashion cycle is defined as the periodic return of specific styles or general shapes. It is the rotation of particular styles. Fashions always change with same series of events:

The new style is introduced

It is worn by many people

Finally, it is discarded

Inother words, new fashions eventually move to a peak stage, become old fashions and disappear. New fashions are always being created as people want to own the newest and latest items.

The fashion cycle is usually depicted as a bell shaped curve consists of five stages as shown in fig 3.1:

a. Introduction

b. Rise in popularity

c. Peak of popularity

d. Decline in popularity

e. Rejection

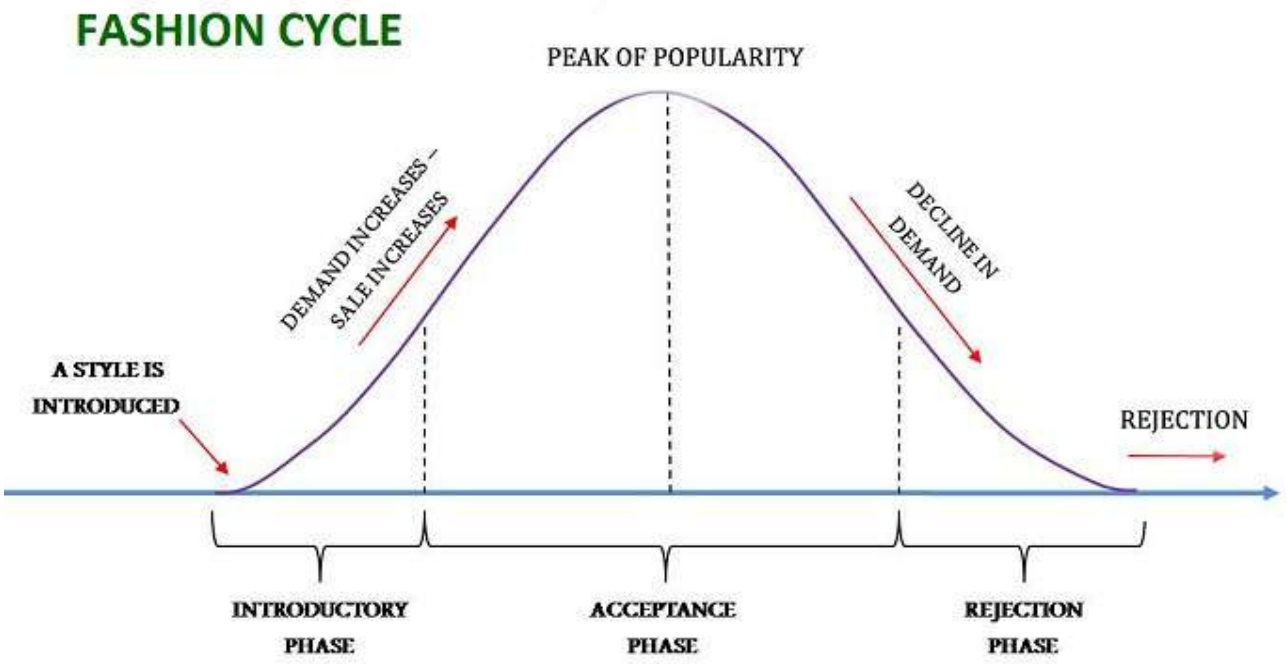

Fig 3.1 Fashion Cycle

The cycle can reflect the acceptance of a single style from one designer or a general style.

a. **Introduction of a style**

The first stage of the fashion cycle is introduction. At this stage the product is first introduced and is accepted by only a limited number of people. Designers interpret their research and creative ideas into apparel or accessories. New styles called the 'latest fashions' are offered to the public by changing elements such as line, shape, colour, fabric details and their relationship to one another. At this stage of cycle, fashion implies only newness and styles not yet been accepted by anyone. Now styles are introduced at a high price level with good workmanship, quality of materials and so only few people can afford them.Production in small quantities gives freedom, flexibility, and room for creativity.

b. Rise in Popularity: This is the second stage of fashion cycle. When the new original design is accepted by an increasing number of customers, it is considered to be in its rise stage. If a new style is purchased, worn and seen by many people, it may attract the attention of buyers, the press and the public. At this stage, the demand is created and the retailer orders for this apparel in maximum quantity. Popularity of a style may further increase through copying and adaptation with less expensive fabrics and less details to cater to the needs of other segment of the society.

c. **Peak of Popularity**: This stage also called as "Culmination" stage of the fashion cycle, is the period when a fashion is at the height of popularity and use. When fashion is at the height of its popularity. It may be in such demand that many manufacturers copy it or produce adaptations of it and sell at prices within the range of most customers. This stage

may be long or brief, depending on how extended the peak of attractiveness is. At the culmination stage, the high-price line fashion buyers stop reordering the fashion and begin reducing their stock levels. Sometimes a style becomes classic, and settles into a fairly stable sales pattern at this stage. Introducing new color, texture or details in the existing style may keep that style alive for longer period.

d. **Decline in Popularity**: Due to mass production and many people using the style, there monotony sets in and the consumer demand decreases for that fashion. Fashion conscious people become tired of a style and therefore begin to look for something new. This is known as the decline stage. Consumers still wear these styles, but they are no longer willing to buy them at regular prices. At this point, production stops immediately or comes slowly to a halt. Leading fashion stores reject the style while retail stores put such declining styles on discount sales. The styles which were once sold at a higher price now will be available at a very low price.

e. **Rejection of a Style or Obsolescence**: In the last phase of the fashion cycle the rejection or discarding of a style takes place because it is no longer sold at any price desired by a consumer and is out of fashion. This is also called consumer obsolescence. As fashion is in its last phasesome consumers turn to the beginningof a new cycle. As early as 1600s Shakespeare wrote that “” fashion wears out more apparel than the man’’.

Length of Cycles

The life of a fashion can seem quite short. Though there is a cycle pattern seen in the fashion cycle, there is no measured time that indicates that a particular style exists for quite some time before it reaches the last stage. This period may range from several months to several years. Predicting the time span of a fashion cycle is impossible since each moves at its own speed.However, one guideline can be counted on. Fashions seem to be extreme and daring when first introduced, smart and stylish when they are popular and old-fashioned and outdated after their peak period. Some fashions last a single selling season, others last several seasons. Certain fashions fade quickly others never completely disappear. Rapid technological development and instant communications have much to do with the speed. Whereas all fashions have life cycles and all can be depicted by a bell –shaped curve No two curves match each other. The rise and fall may be gradual or sharp. The shapes of the curve are different for each fashion. Men’s women’s children’s accessories all have life cycles. Furniture, household appliances and home electronics alsohave life.

3.4 Theories of Fashion adoption

Fashion is one of the greater economic forces in the present-day life. Fashion is like a river; continuously flowing sometimes slowly and gently and sometimes rushing and unstable. But how do they begin? Who startsthem? How are others able to use it? In fact, fashion theories help us explain this phenomenon of fashion.

Successful marketers of fashion realize that it is important to understand how new fashion ideas are disseminated and how they are adapted to fit the tastes, lifestyles, and

budgets of different consumer groups. Three theories describe how different groups of consumers initiate and lead the movement of fashion;
a.The down – ward flow theory or trickle-down theory.
b.The horizontal –flow theory or "mass-market" theory or mass dissemination theory,
c.The upward flow theory or trickle up theory.These theories explain the course that a fashion travels or it is likely to travel. Eachtheory identifies consumers who are the first to adopt a style and explains how each style is diffused from these leaders to other consumers.

a. Down-ward flow theory or Trickle-down theory

This trickle-down theory of the fashion evolvement was identified and accepted by the 19th century economists. This is the oldest theory of fashion adoption. It maintains that in order to be identified as a true fashion, a style must first be adopted by people of the top social level. They style then gradually wins acceptance at progressively lower social level. Centuries ago the setters of fashion were the royal families. The upper class copied the royalty and they in turn were copied by the middle class. At this time the lower class were prohibited by law from copying the styles. In time, royalty was replaced by the fashion leadership families who are business-men and who climbed to the top of the economics and social ladder. It became important for others in business to adopt the dress, activities and appearances of the fashion leaders.

People who were spread along the socio-economic level found it safe to copy the fashion leaders to the lower strata of people. Eager manufacturers quickly mass-produce lower-priced copies that many consumers can afford. As these new fashions are adopted by the lower stratum, new styles are introduced at the top level. It is during this period that the couture is in its most outstanding position. The trickle-down theory of fashion is applicable in the contemporary scene, E.g. of trickle down fashion where the designer jeans, asymmetrical tops etc.

b Mass market theory of Mass Dissemination

This is also called as Trickle-Across theory of fashion adoption. This theory claims that fashions move horizontally between groups on similar social levels rather than vertically from one level to another.

As the twentieth century progressed, fashion no longer was created by any specific social or economic class. Heroes and heroines from all walks of like became the fashion leaders. Movie stars, television personalities, campus celebrities, folk heroes,sport stars and other figures captured the public's fancy and gave a thrust to fashion. The trickle-across theory of fashion was proposed by Charles W King in 1963. He acknowledged that each group or segment of society has its own leader or leaders of fashion. The approval of these local leaders is required before a fashion can be adopted by the group. Hence there is no longer one channel of fashion diffusion. Many separate markets have developed for various age ranges, lifestyle and tastes. Various designer and manufacturer labels called the attention of various groups at different price points. Paris fashions for example, are now bought and

copied for mass distribution sometimes even before the originals are available to the more affluent markets.

Some other examples of trickle-across theory include the jogging suits for athletes, bell bottom wear and kurta style tops. Fashions are accepted by few before they are accepted by many. This has to be noticed and taken care of as if it is an important step in forecasting. The fashion forecasters should identify and keep a track of these few fashion leaders and their preferences. This helps in predicting the correct styles which may turn into classics rather than fading out as fads.

C. Upward flow Theory or Bottom-up Theories

This theory is also called as Trickle-up or Reverse adoption theory. This is a reverse theory to the downward flow theory. This theory attempts to explain the process of fashion adoption which is relatively new. The bottom –up theory explains the process of fashion adoption which is relatively new. The bottom-up theory explains that fashions filter up from youth to aged and from lower to upper socioeconomic groups. It holds that young – particularly those of low income families and those in higher-income groups who can adopt low income lifestyles are quicker to create or adopt new and different fashions.

The idea behind this theory is that lower income youth have little social position and thus have fewer inhibitions. They are free to create new dress patterns. Those from upper socio-economic groups are safe in their positions and feel free to adopt new dress patterns;those in the middle socio-economicgroups are often more traditional but can accept clothing styles emerging from lower and upper socio-economic groups. One such example is the T-shirts and jeans of the earliest “hippies” which swept the world and became the uniform of the young and would be young all over the world. Other examples include the denim; glitter tops, metal shine garments etc.

3.5 Silhouettes and their Types

In fashion, the term “Silhouette” is used to refer to the line of a dress, or the garments overall shape. A figure in the distance will be silhouetted against the background before any details of cut is visible, even before color can be clearly seen. Silhouettes in fashion change over time. Many periods in women’s fashion even have a distinct silhouette that we automatically associate with the clothing of that decade or era. Learning to recognize fashion silhouettes can make it easier to date fashions, as well as help in understand which silhouettes works best for the body type. The structural seaming of a garment, important as it is existing primarily to create the silhouette.

It may be classified as

A-line

The most common one that has the hem larger in proportion to the chest and waist giving a classic "A" appearance. An A-line dress will flair out from waist and will have a silhouette like the letter "A" as it falls to the ground. It is actually a combination of fit and flare. It's softly shaped at the waist. It gracefully hugs the natural curves of the upper body and then it flares out into the "A" shape as it falls. This silhouette is flattering to most body types, but it does emphasize the waist. This is a very common silhouette type and is similar to trapeze. Although A-line comes from the waist line rather than the top of the garment. The hem is larger in proportion to the chest. This gives a classic A shape appearance.

Empire

The empire-style gown has a high waistline under the bust with a narrower skirt. This silhouette involves a line below the bust that creates two panels dividing the garment. It was very popular in the 60's it is a figure –hugging dress and takes emphasis off the waist. It elongates the body, giving an appearance of being taller. People who want less emphasis on the bust and hips should avoid this shape. This dress has a waist line which is raised to directly beneath the bust, with a skirt that flares slightly from the raised-waist down. This dress is particularly recommended for women with a pronounced hourglass shape.

Shift

The shift silhouette is a straight cylindrical shape to a garment achieved by giving the same measurements to the chest, waist and hem.

Tent

Trapeze is triangular shape. The flare comes from the top of the garment. This is normally used when designing dresses or blouses. The line of the garment is a continuousflare.

Asymmetrical

This garment style does not have a symmetrical form. This can be achieved by varying the panels, fabric used or hemline.

Sheath

The sheath silhouette is used to refer to dresses that are from-fitting from the bust through the length of the thighs. This is generally recommended for thin women who have gentle to no curves. Curvy-full figured women or short women should avoid this silhouette because it hugs.

3.6 Summary

The classification of fashion gives the concept and idea that has to be followed for the designer. Different terminology gives an insight into the world of fashion business. Theories of fashion show how a fashion reaches its peak and declines to nothing indicating the various length of time it takes from popularity to decline of a style.

I. Test your understanding

State if the following statement are TRUE or FALSE

1. The duration of fashion is important and critical to a fashion designer. (T/F)
2. Sari can be classified as fad (T/F)
3. Fashion is a style that is accepted and used by a majority of group at any one time (T/F)
4. The finest dress making in French is called classis (T/F)
5. Custom is also called made to-order apparel (T/F)

Test your understanding

Fill in the blanks with correct answers:

1. The _____ is a shape or outline or contour of a clothing style.
2. Strong colours, bright bold prints, exaggerated accessories are typical examples of _____
3. The _____fashion consists of styles that are widely accepted by majority of consumers.
4. The direction in which fashion is moving is called_____
5. New styles are introduced at _____ and so only few people can afford them.

Model Questions

Short Type Questions

1. What is the different between style and fashion?
2. What is meant by couture?
3. When a fashion is called Avant-garde?
4. Difference between Fad and Classis.
5. How is Fashion illustration useful for a designer?
6. What is the difference between knock-off and fad?
7. Explain what does empire line mean and where does it fall.
8. What does the length of cycles indicate?
9. When does fashion decline in popularity?
10. What is mass market theory called?
11. Name the theories of fashion adoption
12. Who proposed trickle-across theory of fashion?
13. Which is the oldest theory of fashion adoption and why?

Long Answer Type Questions

1. How is a fashion cycle depicted? Show the stages on your illustration.
2. Explain what a silhouette is and different types of it.
3. Describe a fashion cycle.
4. What is a classical item? Explain with an example.
5. Write about theories of fashion adoption.
6. Describe the various stages of fashion cycle.

7. Difference between bottom-up theory and Mass Dissemination theory

Answers

I. Test your understanding:

1. True 2.False 3. True 4. False 5. True

II. Test your understanding: Answers

1. Silhouette 2. Fad 3. Mass 4. Fashion Trend 5. High price.

Unit 4

Designing Process

Structure

Learning Objective

At the end of the chapter the student will be able to

Understand the importance of themes for designing

Develop relevant themes for clothing designs from various inspirations

Follow the process of designing in a sequential manner

Realize the important aspects in designing a line

Build a logo label to be used as an identification mark for the lines

Conceptualize the color and texture rendering techniques

Develop the skill of rendering different types of fabrics

Develop a line of garments based on the theme

Acquire skills in presentation of the line to the customers

Unit Preview

In order to develop a line of garments this chapter allows the student to understand how the lines can be developed and the different components of the line. As a part of illustration of the line the student can also understand the importance of rendering different types of fabrics.

4.Introduction

The development and formulation of a design requires careful involvement of the designer. A proper process should be followed which involves a course of action that would make reaching the goal very much easier and simpler. An idea has to be conceived which later is expressed in a form. There may be constraints like materials and other things to be used in creating the design. But overall it is a very challenging job to create a design that is aesthetic, creative and innovative at the same time.

4.1 Theme based – Designing fashion illustrations

A constant search for the 'new' describes the rate at which the fashion industry operates today. This newness is driven by certain key elements bringing in a rush of excitement every season. The fashion calendar is divided into two seasons – 'spring summer' and 'fall winter'. Positively the first 6 months of the fashion year constitute 'Spring summer' and the remaining 6 months comprise 'fall winter 'break up. This 'season break up' is also regulated by the geographical situation or the geographical position of a particular place. For e.g. A place like Hyderabad does not see a winter, thus the season break up would not apply as indicated by the strict definition.

Fashion has attained a global appeal: this goes to say that it has with a mass-produceduniformity. Thus, to initiate the process of line planning the fashion designers follow varied forecasting sources to arrive at a range of garments with a global appeal. Each line starts as a vision in the mind of the designer. In the women's apparel industry 4-6 new lines or collections have been customary in the past. The opening dates and number of new lines vary from one segment of the industry to another, but as a general rule, Higher priced lines will be presented before lower priced lines. The size of the firm, the nature of the apparel produced and the fashion orientation of the company influence development of lines. In large firms, merchandisers are responsible for developing lines.

Today 'Fashion 'is defined as an extensive procedural process that produces utility clothing. To understand this process, we need to understand the concept of line planning. This term primarily indicates a range or collection of garments falling in the same category (like casual wear, formal wear, bridal wear, lingerie and ethnic). The design process triggers at least two seasons before the actual selling season to facilitate the arrival of merchandise at the right time in the market.

4.2 Development of a collection

A line should focus the type of customers to whom it is targeted. Lines designed without orienting towards a specific type of customer's market will end in failure. Every line is developed in a series of processes starting with the story board**.**

a. Story boards

The designers generate Design sheets or Design boards with in-depth study of the fashion forecast services. Story board is visual form of expression. These boards start from a source of inspiration. This board comprises the visual pictures in the form of story on the board. Along with name of the collection a brief write up indicating the mood of the collection lines is given in the board. Inspiration source could be any entity the designer feels in accordance with the forecast. Example: India street, geo-floral, surfing. USA, calligraphy. A story board on 'PEACOCK is shown in fig 4.1

Fig 4.1 Story Boards

Later, key words are generated to formulate the styling of garments. Continuing with one of the above example – calligraphy, key words like curvaceous, smooth, and feminine elegant, bell shape, continuous etc. fit the line. The collection-colour fabrics, prints and silhouette will be inspired by the theme of the mood board**.**

b. Colour Board

After the story board has been formulated, a visual presentation of colours in the form of swatches, write up (adjectives of colour may be used), pantone chips etc. is done. Pantone contains the 4.4 standard colours, which are numbered. This number is indicated along with the colour for accuracy in colour shade and tone.

Fig 4.2 Colour board

C.Fabric/Swatch boards

These contain fabric swatches. Swatches are cuttings of fabrics indicating the selection of fabric to be suitable for garment style. Swatches could be a small clipping or could be large enough to show print repeat, embroidery details or trims. It also gives a rough estimate of the garment drape. An example is shown in fig4.3.

4.3 Colour and Fabric/Swatch Board

d Illustration boards

Once the story board is created, the illustration board, which talks of fashion drawings of human forms (women, men and kids) with garments rendered on them is done. This rendering of garments on the figure sketches create an element of interest. Illustrations could be hand rendered or worked on the computer using latest software like Adobe Photoshop, illustrator.

Different types of figure formats are in use. Single, double or multiple figure formats can be selected by the designers depending on the intricacy of the designs. Generally, both the front and back view of the illustration is done for complete visualization of the garment design.

Fig 4.5 Illustration boards

e.Flats

Flats are miniature drawings of garments when drawn flat on table. On the design sheets, it is important, to indicate flats or specification drawing. Specification drawings or specs as they are called are small proportion drawings, with measurements of the various styles furnished. It also contains details of construction lines useful and relevant information to the production department of the apparel industries. This also helps to know about the calculation of the fabric to be used in the collection.

Fig 4.6 Flats

f. Client board

This board gives the details of age group, season, target market and exact or approximate costing of the line. The layout of these sheets could be changed as desired by the designer

Fig 4.7 Client board

g. Tag designing

Tags are designed with theme, colour board, swatches, wash and care price code and price.

h.Logos/labels

Company's name can be designed and attached along with tags for fixing on the garments. Size tag may be attached with the label or may be separate.

Activity

Collect some good black and white photographs from the magazines or old photographs from family album. Observe the interaction of light and shadow in the picture. Try on the paper and maintain a record for the same.

Refer to magazines for the different lines developed in different seasons. Study how they were developed and note your observations.

4.3 Use of colour and texture in rendering illustrations

Textures create good interest to an illustration, depicting the type of material to be used in the line with realistic and nearing accuracy. These may be rendered in an accurate way which creates the 'feel' of the fabric rather than showingevery detail. Simple drawings look better and more clear and easier to interpret than cluttered, overworked drawings. It is

not necessary to show a texture over the whole surface of a garment. Try fading, it is not necessary toshow a texture over the whole surface of a garment. Try fading it in areas of highlight and darkening it in shadows, or render only the dark side of the figure, leaving the light side plain.

A white space used for highlighting, by the side of the body between the colour and the outline adds interest. The size of the texture should be in correct proportion to the size of the figure. Very small textures cannot be rendered accurately, so sometimes an overall effect can be shown

When using colour, try using complementary colour for shadows instead of blacks and greys. They still look like shadows, apart from adding a lot of vitality to the work.

Light bright and warm colours advance, full dark and cool colours recede. On a walking figure, the back leg and foot should be shaded and the front foot should be light. A spot of highlight can be shown on the front knee to bring it forward. The more back the form is, the darker the shading can be. Observation and awareness of fabric drape through photographs, especially black and white photographs will be helpful for proper rendering of figures.

a. Shiny Surfaces

Satins are smooth, shine and reflective. They have many highlights, with rich and deep shadows. Colour application should be smooth and follow the folds of the fabric. To keep the texture simple, only three layers of different ones should be used. Highlights may be emphasized with white point or pencil. Out-lines should be smooth and requires undulating fluid lines (rising and falling), which cling close to the body (Fig.4.8)

Velvets are like satin but are thicker, heavier and have a tougher finish because of the pile. It can be similarly rendered as satin, but hem lines are rounded off to indicate the thickness of the fabric. Shading can be done over the highlight with a pencil to give a textured finish resembling the nap or pile.

Fig 4.8 Shiny surfaces

b. Sheers

Fabrics such as chiffon, organza and lace are semi-transparent, therefore the skin and underlying fabrics can be seen. Use of the same colour in various tones results in creating layered effect. More the layers the darker the effect is.

Fig. 4.9 Sheer fabrics

Start by sketching the outer garment and the lining shape beneath. Use a mid-tone for the lining or undergarment and skin tones for other areas, leaving white spaces for highlights. Apply soft shadows wherever fabric folds and drapes occur, keeping the brush strokes smooth and simple. When dry, apply the lightest, most transparent tone for the sheer outer

garment. To finish, lightly outline the hemline, garment parts and major folds and creases with a pen or pencil (Fig 4.9)

c. Brocade and Sequins

These fabrics have the shine, highlights and dark shadows as that of satins, but their surfaces are rough with a pattern, which need to be shown clearly. Apply the flat base colour to the garment leaving plenty of highlighted areas. When dry, add a darker tone of the same colour for shadows. Start the pattern with the same darker tone. Use fine lines of darker tone, for outlines and shapes such as sequins or brocaded motifs. Finish with flecks of white highlights for glitter effect (Fig.4.10).

Fig 4.10 sequins

c. **Checks and Stripes**

Folds, tucks, pleats, darts, body contours, design lines and panel line distort the direction of the stripe or check. Horizontal stripes follow the flow of a hemline, so start from the bottom and work up. Build up a check or plaid by starting with the lightest colored stripe and adding darker colour either horizontally or vertically (Fig 4.11

Fig 4.11 checkered fabric

Activity

Collect fabric swatches, cut them into square pieces of 3x3 inches and paste them in a record. Draw another square of 3x3 next to the swatch and try copying the colours, textures, prints using colour pencils and water colours. This will give you an idea of how to develop various textures.

Students can experience the design process by selecting one theme group wise and design a line of garments and prepare story board colour and swatch board, illustration board, flat and client board.

4.4 Summary

Theme based designing and selection of theme for developing a line is a basic necessity for a designer. The process which includes creating a story board, illustration board, flats, colour and swatch board and other important aspects that are to be followed in theme-based designing allows the students to gain confidence. Rendering techniques to a design further improves the ability to translate the design effectively. Above all presentation of line to customers is also very important.

Terms introduced

Fashion calendar: A valuable industry resource that serves as an authoritative guide for Fashion including buyer's manufacturers, designers and editors.

Lingerie – Most intimate garments or undergarments that are used by people. Inner elegance

Merchandiser – A merchandiser is someone who is continuously involved in business promotion by buying and selling of goods.

Pantone – A set of colours bearing numbers for each hue, shade and tint. These colours are used in forecasting and by the Fashion designers.

Rendering - A process of depicting the fabric features in true replica on paper. The rendered one should give a feeling of original fabric.

Colours advance: Feeling that is experienced by some colours as though they are moving forward towards us.

Highlights: An area or a spot in a drawing, painting, or photograph that is strongly shown.

Brocade: It is a class of richly decorative woven fabrics, often made in colored silks and with or without gold and silver threads.

Sequins: These are disk-shaped beads used for decorative purposes.

I. Test your understanding

State if the following statements are TRUE or FALSE

1. The fashion calendar is divided into two seasons (T/F)
2. Garments with lower priced lines will be presented before higher priced line (T/F)
3. Story boards are divided after the designer gets an inspiration (T/F)
4. Colour board may also contain swatches of fabrics to be used in the line. (T/F)

II. Test your understanding

Fill in the blanks with correct answers:

1. *To depict the type of material in a realistic way _____ is done to illustration.*
2. *To show shadows to an illustration _____ colours should be used instead of black and greys.*
3. *A _____ space between body of the colour and outline is added for high lightened effect.*

4. *Highlights may be emphasized with _____ paint or pencil in satins.*

5. *Chiffons and organza and lace materials are called as.*

Model Questions

Short Answer Type Questions

1. What is astory board?
2. What does a colour board indicate?
3. What is the content of swatch board?
4. How are illustration boards useful for a designer?
5. Differentiate between client board and story board.
6. How is a fashion calendar divided into seasons?
7. How does a line start?
8. What should be the colours used for shading an illustration?

Long Answer Type Questions

1. Write about story boards and their preparation.

2. How are colour, swatch and illustration boards created?

3. What type of information is available on flats and client boards?

4. Describe the use of colour and texture in rendering illustrations.

5. Write short notes on the methods of rendering
   (a) Sheers
   (b) Brocade and Sequins
   (c) Patterns and Prints
   (d) Checks and Stripes
   (e) Shiny surfaces

Answers

I. Test your understanding:

1. True 2. False 3. True 4. True

II. Test your understanding:

1. Rendering 2. Complementary 3. White 4. White
5. Sheers

UNIT 5

Designers of India

Structure

Learning Objectives

At the end of the unit, the student will be able to

- Understand the importance of fashion designer in creation of styles
- Roles and responsibilities of designers
- Identify the top Indian designers in the field of fashion
- Distinguish the work of different designers and their specialty area

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Unit Preview

Gaining popularity of fashion clothing created a space for designers. There are many designers, each specialized in their own way. This chapter deals with the top ten designers of India, their specialty and their work in fashion world. As the top ten always keep changing over a period of time the student is expected to keep abreast of the top designers from time to time.

5.0 Instruction

People of all ages and sex are passionate with the new trend of fashion designing. With the popularity of fashion clothing, various fashion designers and their designs have made a mark among people. Today there is a great opportunity in the field of design for people with good talent, imagination and a flare to design. Many fashion institutes have come up with an aim to generate good designers who can bring India in the forefront of fashion. To become a designer is not an easy task. This is a challenging task requiring many aspects to be

taken care of. It requires various tasks such as research of the market, need identification of the consumers and satisfying their needs through good design. Insight and perception always play a large part for the success of a designer. Let us consider the special qualities that make a good designer.

5.1Basic Requirements of a Designer

Fashion designer is also called an apparel designer who creates new ideas for garments and accessories. Fashion designers must be imaginative, have natural ability to design and have talent. They should love fashion, fabrics and beauty. They must be creative artists who can sketch and who have a strong knowledge of art elements and principles. They must be able to generate a constant flow of ideas. They should have an awareness of changing social and economic movement so that their designs have a good consumer demand. Current trends in consumer's purchasing practices lifestyles and attitudes are to be noted and analyzed. They must also be decisive and believe firmly in their own creativity. Fashion designers must have technical knowledge of fabrics, trimmings and fit. They should keep up with art and fashion news through trade publications. Visiting fashion shows, retail stores helps them to keep in touch with new trends. Technical skills like pattern making, draping and sewing will be an added talent. They should be able to visualize the three-dimensional garment before it is made.

Designers must continually study the lifestyles of those consumers, for whom their designs are intended. Because designers work far in advance of the final production they must be able to predict future fashion trends.

They must be aware of the effects of current events, socioeconomic conditions and psychological attitudes on fashion interest and demand. Constant experimentation with new ideas is a must. A designer should be able to get ideas and inspiration from all cultures and lifestyles throughout the world by going through museum exhibits, art shows, the theater, dance, world travel and especially fashions of the past which are rich source of design inspiration. They should take precaution to ensure that they are presenting what consumers want. They should have new styles ready by the time the old styles become obsolete. Designers must plan and improvise the work of their staff members.

They should understand manufacturing process and should be able to help with the costing of the garments. All designs must be produced at a profit and within the firm's predetermined wholesale price range. So, they should consider the availability and cost of materials and techniques of production and labor costs. They need to work easily and comfortably with others, which call for characteristics like flexibility and cooperation. They should work well, under pressure often in restricted working conditions. Designers must have enthusiasm, determination, and drive to succeed in this demanding career. They need to deal with buyers and fabric sales people in addition to management, production and publicity teams with great interest and enthusiasm.

Designers influence fashion by providing an unending series of new designs from which consumers choose the best ones to express their individual lifestyles.

5.2Indian Fashion Designers

Making an impact on consumers with lack of awareness in high fashion was a great achievement in a country like India. Fashion designers over the decades have become so much a part of Indian fashion scene that they are now respected, revered and consulted at every turn. These are the designers who have studied the intricacies of western fashion and adapted it to suit Indian norms. Indian designers are the trail blazers who gave a new dimension to haute couture in India. The top ten designers of India and their contribution to Indian fashion industry, an overview is as follows.

1 Manish Arora

Born and brought up in Mumbai graduated in Commerce, and later joined the National Institute of Fashion Technology in New Delhi. He graduated in 1994 after winning the Best Student Award. In 1997 he launched his Label "Manish Arora" and started retailing in India. Three years later in 2000, Manish represented India at the Hong Kong Fashion Week and participated at the first ever India Fashion Week held in New Delhi. The following year Manish launched his Label "Fish Fry" and showed this collection in six leading cities in India and was stocked at Lord and Taylor, New York.

Arora's future-in-outer-space inspired line at the Wills India Fashion Week 2007 attracted international viewers. He is regarded by many as the "John Galliano of India". He is known for a rich palette of psychedelic colours and Kutch motifs in garments that combine traditional Indian crafts embroidery, appliqué and beading with Western silhouettes. This Indian designer, known for his colorful fashion shows has created a collection of lip glosses, lipsticks, blush and a fabulous eye palette with bright shades.

2 Satya Paul

Satya Paul was born in a city called Leigha, which is located in Pakistan. He arrived in India during the tumultuous period of partition. His initiation in the world of fashion was marked when he launched his brand name in the year 1985. Ever since then his name has been attached to some of the most premier designs in sarees, kurtas and accessories that lend a surfeit of creativity to the world of Indian fashion and glamor. He is the pioneering head behind 2 of the most prestigious fashion stores in the country, Heritage and L'affaire. Since the 80's they have been the vanguard of dealing and selling in Indian creations with a modern twist that has taken Indian fashion from being ordinary to revolutionary.
In addition to catering to some of the crème la crème of Indian society, Satya Paul has also been a great supporter of weavers and craftsman all over the country and has taken inspiration from them to weave his own designs.

Satya Paul, the name is more than enough for any fashionista to know the value of the attire, since this brand name has been an equivalent to class and style while being true to what Indian traditional wear is all about. From saris to scarves, ties, clutches, handbags and

women's accessories, Satya Paul has made a distinct mark in originality and creativity which have lured women and men alike from all over the world.The prints are by no means ordinary or mundane. One of his saris, for example, has a large 'Om' motif in the color white with hues of yellow and blue in the background. The motif is only in one place, and that is the pallu.

The best thing about Satya Paul's designs is that they change with the current style, which is why the name has lasted and reigned for as long as it has. But saris are not his only area of expertise. His creative brilliance has spread onto other accessories as well, including long and flowing Kaftans, scarves, ties, cufflinks, wallets, hand bags and clutches as well. From the very traditional peacock feathers or cheetah stripes spread out across glitzy colors of hot pink, red, yellow and greens, to the imprint of web pages from Google used to adorn a traditional saree, quirky is the basic essence of all Satya Paul creations.

Satya Paul is a well-known name across Indian borders as well, and there are numerous websites which sell merchandise made authentically by the designer, which are made available to Indians as well as people living in countries like U.S., U.K. and Canada. Due to their modern yet ethnic appeal, Satya Paul attires have been more than welcomed by people from different countries and of different tastes.The ties are rich in texture and color due to the fine Silk used. But other than the traditional styles, the ties made by Satya Paul have unusual motifs such as hearts, leopards, horses, and unique geometrical patterns as well.

3 Sabyasachi Mukherjee (born 23 February 1974) is an Indian fashion designer from Kolkata. Since 1999, he has sold designer merchandise using the label Sabyasachi. Mukherjee is one of the Associate Designer Members of Fashion Design Council of Indiaand the youngest board member of the National Museum of Indian Cinema. In 1999, Sabyasachi Mukherjee graduated from the National Institute of Fashion Technology India.

In 2002, Sabyasachi Mukherjee participated at the India Fashion Week which got positive feedbacks from the press. During the spring of 2003, he made his first international runway, with the "Grand Winner Award" at the Mercedes Benz New Asia Fashion week in Singapore. In his collection "Kora" at the Lakme Fashion Week 2003, he used unbleached and hand-woven fabrics with Kantha and other hand embroideries. In 2004, Sabyasachi took a step ahead with Kuala Lumpur Fashion Week and The Miami Fashion Week with a bohemian take on Indian textiles and his collection was called "The Frog Princess". In 2005, his spring-summer collection, "The NairSisters" was inspired by hand blockprinting, embroideries, bagru prints and the extensive use of cotton and other hand-woven fabrics. The collection was sold at Browns & Selfridges in London. He was requested to showcase his collections at the prestigious Oxford University annual black-tie charity dinner fashion show.

2007, Sabyasachi participated at the New York and at the London Fashion Weeks plus Bridal Asia 2007, Lakme India Fashion Week and the Vogue Launch event in India. His "Sanctuary" collection showcased at Lakme Fashion Week Fall Winter 08 received positive reviews from the fashion editor of the New York Times Suzy Menkes.

The collection was showcased at the Vogue Wedding Show 2016. He launched his exclusive menswear collection featuring Sherwanis, Kurtas and headgear at the Lakme Fashion Week Spring Summer 09 Grand Finale show. He also started a kid wear line under the label *Chota Sabhya*.". He uses unusual fabrics, texturing and detailing, fusion of styles, patch-work with embellishments in a vibrant color. His creations evoke images of ancient and medieval ages. He describes his own collections as "an International styling with an Indian soul". He pioneered the use of Indian textiles in a modern context. His unique contribution

was the use of indigenous methods like bandhani, gotawork, block printing, hand dyeing etc. in construction of modern silhouettes. Sabyasachi is especially famous for Indian Bridal Wear.Sabyasachi's collection of Winter-Festive Lakme Fashion Week 2011 revived the finer version of Khadi.

4 JJ Valaya

Born and raised in the historical city of Jodhpur in Rajasthan. India's premier fashion designer. JJ.Valaya has made a name for him as one of the most original and inspired designers working today. Valaya has rejuvenated and redefined age-old Indian crafts as a profitable niche within the cosmopolitan market, allowing the valued artistic processes to live on despite the pressures of globalization.

In 1984, Valaya became the first Indian couture label to have a solo show in India. He opened a label JJ.Valaya Life India's largest single designer store till date. Since 1997, the House of Valaya has shared the catwalk with many of the world's top designers in Hong Kong, Singapore, Bangkok, London,Dubai, New York and Paris. As one of the most respected designers in contemporary fashion. JJ.Valaya continues to wow fashion's toughest critics with his two apparel lines. Couture and Diffusion, and his product labels Valaya Home and Studio Valaya. He remains as one of the biggest names in the bridal trousseau market in India and was one of the first Indian labels to invest in sampling, research and development at their "House of Valaya" establishment at Manesar on the outskirt.

5 Wendell Rodricks

Wendell Rodricks is a prominent fashion designer based in the western Indian region of Goa. He has been listed among one of India's top ten designers. His work has involved a wide range of fashion – from lecturing on world costume history to fashion journalism and styling for international advertising campaigns.

He is among the few designers who are obsessed with Indian fashion. His art designs truly reflect the inspiration drawn from ancient India. Simple cuts and perfectly conceived light and fluid attires are his specialty. One can be sure that his clothes would have no heavy embroideries and no stiff clothes. They would be easy to carry yet give that elegant look that one aspires to have. Wendell Roderick's clothes could be worn at society at large. His style is a range among Indian Clothes lovers and he is known for his passion for white. After completing his training in Los Angeles and Paris, he came back to India in 1988. The next two years, Wendell spent designing attires for reputed companies, such as Garden Vareli, cosmetic giant Lakme and diamond corporate DeBeers. It was in 1990 that the designer launched his own label "Wendell Roderick".

He has written special features for Apparel, regular columns for Femina, Goa Today and freelance fashion journalism in major Indian news media. The multi-talented designer's work includes theatre design, advertising styling and forecast portfolios.

Wendell Roderick was the first Indian who had got an opportunity to display his collection at the world's largest garment fair at IGEDO, Dusseldorf. He has designed

uniforms for the Goa State Traffic Police, the Four Seasons, the Goa Marriott Resort, the Vasco Sports Club football team and the staff of the Goa Tourism Development Corporation.

6 Rohit Bal

Rohit Bal, the fashion designer is from the valley of Kashmir. The "Bad Boy" of the fashion world, as Rohit Bal is popularly called is known for his sophisticated cuts and breathing fabrics. He weaves in the best for both men and women. Rohit Bal is called as "Indian Master of fabric and fantasy". He did his graduation from New Delhi's St. Stephens College with a first class (Hons) degree in History. Rohit Bal at the age of 12 years designed his first outfit, a pair of corduroy bell bottom with tussle. He worked for a few years in his brother's export company. In 1990 he created his first line, traditional designer wear for men.

He draws inspiration from history, fantasy and folklore. He experiments with different colours following the golden rule i.e. light for the day and heavier for evening. He uses matching colour of lingerie to the dress and hem and does wonderful hair colour to improve ensemble. He has had successful stand-alone fashion shows in New York, London, Paris, Dubai, Singapore, Mauritius, Saopaolo and all the major cities in India including New Delhi, Mumbai, Chennai, Banglore, Calcutta. He was also chosen by the Khadi Gram Udyog to collaborate with khadi and design collections for them to sell in all their outlets.

7 Manish Malhotra

Graduated from Elphinstone college, Mumbai, Manish is a well-known designer in new fashion world as well as in Bollywood. This Punjabi holds the credit for making a designer revolution in Bollywood's fashion Scenario with his uniqueness and inimitable style in designing which can approach the entire look of the character. At the age of 25, Manish Malhotra stepped into Bollywood and today, his name is synonymous with style in Hindi films. Malhotra's first fashion show was in 1999 which received great appreciation.

Malhotra uses clear and bold colours like black, red and opts for pastel colours like lilacs, lavenders, whites, creams pink and lemon instead. His garments include short kurtas with stoles, hip length tops, loose knit shirts, silk corsets and lucre trousers for women & kurtas, kurta shirts, full shirts, short shirts, jackets and draw strings for men. He likes lots of silk embroidery. He doesn't like gold, he likes Swarovski crystals, that they give a nice shimmer.

Manish set up REVERIE, hishigh-profile couture store in alliance with industrialist and socialites Yash and Avanti Birla. Malhotra is proud of the fact that he designed for Micheal. He has also been graced with Indira Memorial Award for his contribution to the fashion industry. He was facilitated by NIFT, New Delhi, and The Indo American Society for his fashion designing.

8 Ritu Berri

Ritu Beri graduated from Delhi University in 1987 and was amongst the first batch of 25 students from NIFT. She is known as the first Indian Designer to present a collection in

Paris. She created a collection in her graduation and with them started a studio "LAVANY" in December 1990. She achieved instant success with this collection even in the fashion at London's regent street. Ritu Beri's ready –to-wear line is an impressive couture collection that had the French media raving about her. She designed for Atlanta opening ceremony by creating a special collection. She even launched a program "caring for sharing "where she designed a unique collection of line styled with products range on animals.

She is the only Indian designer to be featured in promostyl's magazine Acustyl, which forecasts fashion trends worldwide.

9 Ritu Kumar

Ritu Kumar has contributed in the revival of Indian crafts. Her designs reflect the ancient traditions of Indian craftsmanship in a contemporary fashion. In 1964 she graduated from Lady Irwin College, Delhi in 1967 she has set up a workshop at Kolkata with largest collection of blocks in the world. Ritu Kumar mastered in Block prints, Kasuti, Chikankari to Zarodosi, Bandini and Kalamkari which was used in her timeless ethnic wear for women.

Ritu Kumar was selected by Miss Universe & Miss World organizations to dress their International beauties – Sushmita Sen, Ashiwarya Rai. Ritu Kumar mostly designs bridal wear sarees. She is creator of first chain of exclusive boutiques in India. She has her own distribution system. Four stores in Mumbai, one in Delhi, one in Amritsar has kept her their locals in traditional wear. In April 2002, Ritu Kumar launched her new brand, 'LABEL'. 'LABEL' cater todays woman, who is increasingly independent, discerning and global. Her outfits have been worn by celebs like Princess Diana. Ritu Kumar holds the status of a revivalist in the Indian fashion industry, which has successfully bridged the gap between traditional and modernity.

10 Neeta Lulla

Neeta Lulla is an Indian costume designers and fashion stylist who has worked on over 300 films. She has been designing wedding dresses since 1985. Her name became inseparably associated with Bollywood Her first big client was jewelry designer Varuna Jani, though Jani hadn't started her business at the time A notable creation from later in her career was a dress she designed for **Aishwarya** Rai's wedding. She crafted Rai's pearl-encrusted lehenga

After successfully completing the challenge of designing for a period films like Mohenjo Daro(2016), she plans on trying her hand in Tollywood again with Gautamiputra Satakarni. She has been known to utilize Paithani, the ancient technique of tapestry that combines multiple threads of different colors and incorporates gold and silver threads woven together to create a dynamic piece of silk:

"Neeta Lulla has been vocal about combating gender-based violence and has used her work as a platform for promoting the issue. Her 2016 collection "SheIsMe" simultaneously communicated both gentleness and resilience in the face of abuse. The collections debut at Lakme Fashion Week included a dance recital that spoke against women abuse. Lulla comments: Neeta Lulla grew up in Mumbai, India and spent significant time in Filmcity, a film studio within the city. She is now married to Dr. Shyam Lulla who is a psychiatrist.

11 BhanuAthaiya

Bhanu Athaiya née Rajopadhye born 28 April 1929) is an Indian costume designer, having worked in over 100 films, since the 1950s, with noted filmmakers like Guru Dutt, Yash Chopra, Raj Kapoor, Ashutosh Gowariker, and international directors like Conrad Rooks and Richard Attenborough

She made her debut as a film costume designer with theBollywood. In her career spanning 50 years she has received numerous awards. She won the Academy Award for Best Costume Design (shared with John Mollo for her work in the 1982 film, *Gandhi*. She became the first Indian to win an Academy Award She also won two National Film Awards, in 1991 and 2002

In March 2010, Athaiya released her book *The Art of Costume Design*, published by Harper Collins[] On January 13, 2013, Athaiya presented a copy of the book to the Dalai Lama.

On February 23, 2012, it was reported that Athaiya wished to return her Academy Award to The Academy of Motion Picture Arts and Sciences because she felt that her family will not be able to take care of the trophy after her demise. On December 15, 2012, it was confirmed that the trophy had been returned to the academy

Bhanu Athaiya was born Bhanumati Annasaheb Rajopadhye in Kolhapur in Maharashtra. She was the third of the seven children born to Annasaheb and Shantabai Rajopadhye. Athaiya's father, Annasaheb was a painter. He died when Athaiya was nine years old.

Athaiya started her career as a freelance fashion illustrator for various women's magazines in Bombay, including the 'Eve's Weekly'. Later when its editor opened a boutique, she asked Athaiya to try designing dresses, hereupon she discovered her flair for designing clothes. Her success as a designer soon led to her switching career paths. A tribute was paid to her body of work at the opening of the South Asian International Film Festival, New York in November 2005.

Athaiya was married to Satyendra Athaiya, a poet and occasional lyricist for Hindi films. The marriage ended in separation, and she never remarried. The couple has one daughter, who currently resides with her family in Kolkata. Athaiya currently resides in Mumbai.

12 Masaba gupta

Masaba Gupta is one of the rare Fashion designers to create a niche in demanding and crowded Indian fashion industry, at a very young age. Born in 1989, Masaba began her fashion journey reluctantly in 2009, when she was still a fashion student at SNDT Women University.

Her unique approach towards couture and flamboyant use of prints got her noticed and with the encouragement and support of her mentors, Anil Chopra and Wendell Rodricks, she debuted at Wills Lifestyle Fashion week 2009. Masaba is the youngest designer unveiled by Wills fashion week and an instant success there, abided her to launch her label ‘Masaba’.

Her first collection under the label 'Masaba' was 'Kattran', which was featured in Lakme Fashion Week 2010 Spring/ Summer. Masaba Gupta became the youngest fashion creative director, when she joined Satya Paul in 2012. Her floral prints created a gleaming palette of most free spirited Indian bridal designs ever seen. Bohemian traits of her personality can be seen all over her designs and she is thoroughly dedicated to prêt a porter style. Her signature style flaunts neat and quirky silhouettes and distinct use of dupattas like drapes in gowns and skirt ensembles. Masaba Gupta collections are marked out by bold retro styled prints, which are a much-welcomed change from prevalent embroidery and zardosi work. She has brought a new contemporary dimension to the Indian ramps with her fluid and audacious designs, truly accentuating the free spirit of the new generation of Indian women.

Masaba showcased her collection' Wanderess' in the opening show at Lakme Fashion Week Winter/ Festive 2014. This collection featured Masaba's signature free spirited retro designs in Goan prints she went an extra mile with affordable fashion when she launched her brand 'Masaba Lite' to avail her casual designs at a low price. She understands that majority of her buyers belong to an early-twenty age group and her affordable line 'Masaba Lite' will bring sarees in a price range of Rs. 400- 4000, to fit into the pockets of young Indian girls. Under Masaba Lite she has created eccentric prints inspired by Chetan Bhagat's recent novel Half Girlfriend.

Students should be encouraged to collect pictures of the fashion designers and paste them in the record.They should collect the designs of the above designers and evaluate in terms of their work.

5.3Summary

Knowing about fashion and their creator's, aids in developing a keen interest in design. Their inspirations, mode of working, determination, skill in overcoming hurdles and utilizing opportunities all help the budding designers to travel in the right path to reach their destination.

I.Test your understanding

Fill in the blanks with correct answers:

1. The designer who is born in the city in Pakistan ----------.
2. The collection called the Frog princess _____.
3. Fashion stores ---------- and ---------- by Satya Paul
4. Designer born and raised in the historical city of Jodhpur in Rajasthan is _____
5. Who was the first Indian to win the academy awards _____

III. Test your understanding

Statement if the following statements are TRUE or FALSE

1. Fashion designers are also called apparel designers (T/F)
2. Fashion designers must have technical knowledge of fabrics, trimmings and fit. (T/F)
3. Label "Fish Fry" was launched by designer Manish Malhotra (T/F)
4. Neeta lulla did not design clothes for Bollywood (T/F)
5. The first label of Masaba was'' Kattran'' (T/F)

Model Questions

Short Answer Type Questions

1. Who is called as the 'Bad Boy' of fashion world?
2. Who is called as "Indian master" of fabric and fantasy?
3. Manish Malhotra is famous for designing which group of people?
4. Caring for sharing a special programme was started by which designer?
5. Which designer is famous for block prints?
6. Who is the Indian designer known for his colourful collection of cosmetic?
7. Which designer emphasizes silhouettes in her styles?

8. Name the first Indian couture label to have a solo show in India.

Long Answer Type Questions

1. What are the basic requirements of a designer?
2. Who is called India's "Master of Fabric Fantasy" and why?
3. Sabyasacchi Mukherjee has contributed in the revival of Indian crafts- How do you justify this?
4. Write about Masaba gupta as a designer.
5. Why and how is Manish Malhotra famous in Indian fashion world?

6. **Describe the works carried out by the following designers**
   a. Ritu beri b. Rohit Bal c. Neeta lulla

Answers

I. Test your understanding

1.Kashmir 2. Sabyasachi Mukherjee 3. Heritage and L'affaire

4. JJ. Valaya 5. Bhanu Athaiya

II. Test your Understanding

1. True 2. True 3. False 4. False 5. True

UNIT 6

Fashion Fabric

Information Services

Structure

Learning Objectives

At the end of the unit, the student will be able to

- Recognize the importance of fashion services
- Understand the types of services and their assistance to the fashion industry
- Identify the types of services for fashion forecast

- Distinguish between different services and their role
- Make use of different services in creating latest trends in fashion
- Recognize different fabric types available in the market and their characteristics

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Unit Preview

This unit deals with the different books, services available for a right understanding of the material that goes into fashion designing. Designing is done on forecast and so the services of forecaster are a must for any designer. Fabric types and characteristics are a must, to be mastered by every designer and this chapter deals with the same.

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6. Introduction

Designers and merchandisers take the help of fashion service for fashion reporting, forecasting and consulting. These services are available on a subscription or free basis. Some of the major fashion services from Paris, London, Milan and New York are

- Bureau De Style
- Carlin International
- Dominique Peclers

- Esp/Ellen Sideri Partnership, Inc.,
- Here & There
- Promostyl
- The Fashion Service – T fs
- Trend Union
- Actuastyl
- WGSN
- PINTEREST

Fashion**Collection reports** provide the most immediate in-depth information about the collections. These reports include fashion information, photograph, sketches, slides fabric swatches and descriptions**. Trend books** are designed to anticipate the upcoming trends and development in design, fashion, and marketing to give clients a strategic edge in the market place. They may include descriptions, sketches, fabrics swatches and colour samples of garments. E.g. Fashion News, Style Master International, Insights, Vogue, etc.**Consultancy services** are provided by private company's which offer personalized help to their clients.

6.1 Services Available

A Colour Services

These services provide information about new colour, styles and other features for a fee. Some services provide only colour information, others specialize in fabric and still others provide style information with sketches, photographs, or computer-generated images. Fashion professionals and colorists meet at least twice a year to analyze the colour cycles and colour preferences. Forecasts including yarn colours or swatches are usually sent out by colour services to plan their colour stories and purchases of fabrics.

International Color Authority (ICA) recognizes two colour services to continue with the increasing global appeal of the fashion industry.

'PANTONE' has colour fan comprising 1701 hues

'SCOTDIC' (Standard Colour of Textile Dictionaire Internationaleda La Couleur) is another colour company having a library of 6000 colours. All the colours in the colour palette are indicated with Pantone numbers that act as universal code.

Other Colour projection services include:

- Colour Association of the United States (CAUS)
- Promostyl
- The Color Box
- The Colour Marketing Group
- Colour play

B Fashion Services

There are organizations that work as center for fashion services. Designers and merchandisers rely on these services for fashion reporting, forecasting and consultation. These organizations provide consultation for garments collections, market reports and designs to predict future fashions. The popular fashion services from Paris, London, Milan, and /or New York are**:**

- Bureau de Style
- Here & There
- Promostyl
- The Fashion Service (TFS)
- Trend Union
- The Tobe' Report

DNR – First in Men's wear News and Trends (Daily News Record)

This trade publication provides information on the retail as well as the design market. Includes trends in new textiles as well as articles on individual men 's wear manufactures.

Textile View Magazine (often called View)

Textile View Magazine is a quarterly magazine showcasing inspirational colour, texture, images and design.

C.Video Services

Video is an ideal medium for fashion reporting. Fashion channels FTV and other channels provide programmes on designers work and their collections.

D.Loose Leaf and Newsletter Services

Newsletters and industry survey can aid the designer or buyer in forecasting or in finding ideas. Some major services are Fashion Calendar, FGI Fashion Group International, RTW (ready-to-wear) Review and Inside Retailing, etc.

E.Web Sites

Thousands of web sites offer information on fashion.

International Fashion Group's Fashion Access Network (FAN)

www.fashioncenter .com, www.firstview.com, www.vogue.cometc.

F.Directories and Reference Books

Many directories and references can help designers and retailers to get information they need. Fabric Source Book is a directory for resources and fabrics available and supplies index.

G. Fashion Magazines and Newspaper

Fashion trend research also depends on a variety of trade and consumer publications. *Vogue, Gladrags, Women's era*are some of the Indian fashion magazines available for fashion. *Consumer* publications are created for the general public. Each fashion journalist edits fashion trends from a different perspective. Their collective editing can make or break a designer's collection and reinforce trends.

H. Catalogues

Designers also use catalogs as resources for ideas. Catalogues are essentially free magazines. Catalogue prepared by fabric manufacturers for latest prints and colours may be collected by designers before designing.

Activity

- *Students are advised to collect the cover pages of various services available for fashion designers and make a record of them*
- *They can use the computer and access the websites on fashion for the latest trends.*
- *Student should make a record of the latest trends in colour, fabric. Cut and design as per forecast*

6.2Fabric Information

Today's market is flooded with large variety of fabrics aimed at varied end uses. Innovation in fibers and types of finishers has led to this vast stock of fabrics. Knowledge of fabric makes the selection more effective for its end use.

Bird's Eye

Fabric is woven on a special loom called dobby loom with tiny geometric pattern of small diamonds, each having a dot in the center. Usually found on skirts, blazers, trousers and socks. Heavier filling yarns are loosely twisted, making the fabric absorbent. Usually made of cotton, rayon, or blends of them.

Brocade

A figured fabric in which the figure is developed by the wrap threads, in relief against a background. It is made of variety of fibers and often in metallic threads forming a raised pattern. Depending on the weight of the fabric it may be used for clothing or upholstery.

Chambray

This is a checked pattern fabric in which the patterns are formed by the use of coloured yarns in wrap and natural or white filling. This has also a mottled effect. There are endless variations of this fabric, such as stripes and satin stripes. Many novelties are available on the market.

Corduroy

This is a ribbed pile fabric with a high, soft luster. Pile is made with extra filling threads or extra wrap threads,which form loops or floats over the ground threads during weaving. After weaving, the loop threads are cut on a special machine. Threads are then brushed, forming a pile. This is suitable for casual clothes and sportswear.

Crepe

This is a light – weight fabric of silk, rayon, cotton, wool, synthetic or a combination of fibers. It has a pebbly or crinkled surface produced by use of special crepe yarns. It can be crepe or plain weave. Crepe effects can also be obtained by chemical treatment and embossing.

Chiffon

Originally a very light, sheer, transparent, open-mesh fabric made from silk, rayon or blend of fiberswoven in plain weave.

Casement Cloth

A lightweight to mediumweight fabric of cotton or manufactured fiber yarns. It is weft faced and used for curtains.

Cashmere

It is the under-hair of the Cashmeregoat. It is extremely soft and warm. It is used in men's and women's scarves, sweaters and robes. It is also highly priced.

Dobby s

These are fabrics woven on dobby loom. All fabrics have small figures. Such as dots and geometricdesigns; very small floral patterns woven in the fabrics. Fabrics are used for shirting; the huck towels, diapers cloth, woven border saree, drapery and upholstery fabrics.

Drill

A durable fabric of medium weight usually woven on three-harness loom. They are also warp-face left-hand twills made of sheeting yarn, which comes in various weight and thread counts. It is a 2\1 twill construction where, when dyed,it is known as khaki, ticking.

Damask

This is figured fabric made with one weft in which,generally, warp-satin and warp-sateen weaves may be introduced. This is lighter and flatter than brocade and has a high and low luster. It is used for dresses and suits.

Denim

It is a sturdy cotton twill fabric characterized by indigo-dyed yarn traditionally for the weft and a natural yarn for the warp. In the recent years this versatile fabric has been bleached, stonewashed, acid –washed, over dyed and destroyed. Traditionally a 3/1 wrap-faced and more recently, other weaves have been used in lighter construction.

Georgette

A fine, light-weight, open-texture fabric, usually in a plain weave made from crepe yarns.

Gingham

Aplain-weave, light-weight cotton fabric, approximately square in construction, with dyed yarns, or white yarns, form small checks or less usually narrow stripes.

Flannel

A full napped woven fabric, made generally of wool yarns in plain or twill weave with a soft handle. Usually woven with a twill weave, which may be obscured by the nap. Distinguished for its softness it is used for bath robes, skirts, men's suits and trousers. Wool napped fabrics are called flannel while cotton napped fabrics are termed as flannelette.

Gabardine

A regular and steep angle warp-face twill weave fabric made of carded or combed cotton, rayon, or worsted yarns. Twill is to left if made with all single yarns, and to the right when ply warp and single filling yarns are used.

Jersey

This is a smooth, plain knit fabric of wool cotton, rayon or synthetic blends. Usually jersey has a dull surface and excellent draping qualities.

Lawn

A thin fabric with plain weave made of fine, closely woven yarns that are slightly crisp and crease resistant. This is available in white, solid colors or pints. It is used for infant's wear, children's wear, lingerie, and women's wear.

Madras Shirting (Bleeding Madras)

A plain cotton weave fabric, usually in strong colored plaids, stripes and checks which will "bleed" slightly when washed. Thus, is used for shirts, dresses and blouses

Oxford

This is a fabric of plain basket weave of medium or heavy weight. It is woven in varieties of cotton, rayon, or polyester/cotton yarns, with heavier filling than warp yarns. Usually these are mercerized. A number of variations of this weave are on the market for shirting's dresses, and similar purpose.

6.3 Summary

Services of fashion forecaster are an aid to the designer as latest information can be obtained from these people. Knowledge of fabrics and their characteristics are important as each design requires suitability of different fabrics which help in creating the desired look.

1 **Test your understanding**

State if the following statements are TRUE or FALSE

1. Fashion Collection reports provide the most immediate in-depth information about the collections (T/F)
2. Consultancy services on fashion is provided by the government (T/F)
3. International Colour Authority recognizes four colour services(T/F)
4. Promostyl is a video service (T/F)
5. PANTONE has 6000 colours (T/F)

II Test your understanding.

Fill in the blanks with correct answers:

1. Designers and merchandisers rely on _____ services for fashion reporting, forecasting and consultation
2. FTV is a _____ service provided as a medium for fashion reporting.
3. Newsletters and industry survey can aid the _____ or buyer in Forecasting or in finding ideas.
4. Catalogues are essentially _____ magazines prepared by fabric manufacturers for latest prints and colors.
5. An example of Indian fashion magazine is_____

III Test your understanding:

S.No	A	B
1.	Bird's eye	Ribbed pile fabric for sportswear( )
2.	Corduroy	Very light, transparent open mesh fabric ( )
3.	Chiffon	Made with indigo dyed yarn ()
4.	Brocade	Tiny dots of diamond with a centraldot ()
5.	Denim	Plain knit fabric with good drape ( )
6.	Jersey	Raised design with metallic threads ( )

Model Questions

Short Answer Type Questions

1. What are fashion information services?
2. Write about various colour services available for designers.
3. How does a fabric source book help the designers?
4. Give few websites that offer fashion information.
5. What are the popular fashion services available worldwide?
6. What are catalogues?

Long Answer Type Questions

1. Differentiate between
   a. Chintz and chiffon fabrics
   b. Damask and brocade fabrics
   c. Chambray and gingham fabrics

2. Write about the similarities between drill, gabardine and denim.

3. How is crepe effects created on fabrics?

4. Write short notes on,
   Jersey, Lawn, Georgette

5. What are the different services available for designers to create the latest Styles?

Answers

I. Test your understanding:

1. True 2.False 3. False 4. False 5. False

II. Test your understanding

1. Fashion 2. Video 3. Designer 4. Free 5.Women's era

III. Test your understanding: Answers

1. (2) 2. (3) 3. (5) 4. (1) 5. (6) 6. (4)

UNIT 7

FABRIC TRIMS

Structure

Learning Objectives

After studying this unit, a student will be able to

. Understand the importance of fabric trims

. Identify the trims available.

. Understand what surface ornamentation is

. Visualize the usage of sequins and their combinations

. Gain knowledge about the varieties of trims and applications to the relevant designs.

Unit Preview

To make garments and shipping it up-to the buyer, trimmings and accessories have a great importance ingarments manufacturing. There are different types of trimmings and accessories. This chapter shows what are the different trims, their importance and applications.

7.0 Introduction

The materials which are attached to the body of garments by sewing are termed as trimmings. One point should be noted in case of trimmings, all the trimmings are used as decorative and functional / non-functional.

Another one non-technical explanation is that, trimmings are the ultimate materials that are attached with the garments. The garments get highlighted with the use of trims. With the help of trims an area of agarment part could also be emphasised or highlighted. The materials, which are used to make a garment attractive for sale and packing, other than fabrics and trims, are called Accessories.

7.1 Different kinds of trims

A.Surface ornamentation

The concept of adorning the clothes is almost as old as the invention of clothes themselves. Evidences from the past era reveal that men folk employed the use of numerous objects and accessories to adorn their clothes. Today apparel industry holds the pride of being one of the fastest growing industries both domestically and internationally. This industry has been estimated to directly employ as many as 35 million people in India, barring the indirect employment that it has rendered in its allied sectors. Every person wants to add value to his/ her garment. This enhances not only the look of the garment but also makes the wearer feel good of what he is wearing.

MAIN REASONS FOR SURFACE ORNAMENTATION

Increase the value of the garment both by appearance and by price.

Attractsthe customer to buy that particular garment.

WAYS TO ORNAMENT THE FABRIC SURFACE

"Ornamentation" purely depends on the creativity of the designer. There are no limits for surface ornamentation. Almost everything around, us can now be used for ornamentation. Be it traditional printing techniques… to the now latest radium finishes.

In this paper we are going to look at the following ways to ornament the surface: -

Eye catching designs- PRINTING TECHNIQUES

Beautiful usage of thread- EMBROIDERY

A play with colors- PAINTING

Ethnic and indo-westernized embellishments- ZARDOSI, SEQUINS, COIN WORK,

B PRINTING- This is an easy means of surface ornamentation. A varied effect can be obtained by using wonderful colors. The very ethnic batik, kalamkari, is very well known also about transfer printing, sugar print, puff print and glitter print.

C EMBROIDERY- Be it hand or machine embroidery India is famous for her varied stitches all over the globe. This paper covers all about the embroidery styles of India to the latest ones.

D PAINTING- All of us love painting our garment by using fabric paints, but how about silk painting- the latest trend of painting.

E EMBELLISHMENTS- Out for a party or a wedding your garment would be incomplete without embellishments. The traditional zardosi, mirror work, sequins of various shapes and

sizes are just a few of them. The now trendy coin work and shell work with all this your garment will look out of the world.

F MARKET

- Demand for surface ornamented garments with embroideries, sequins and crystals is quite strong in the International market, as also in India
- The size of the Indian market is slated to be around Rs. 800-900 core per annum.

The Indian products have definitely created a niche market in every nook & corner of the world.

A **sequin** is a disk-shaped bead used for decorative purposes. In earlier centuries, they were made from shiny metals. Today, sequins are most often made from plastic. They are available in a wide variety of colors and geometrical shapes. Sequins are commonly used on clothing, jewelry, bags, shoes and many other accessories. Sequins are sometimes also referred to as spangles, palettes', or diamantes, but technically differ. In costuming, sequins have a center hole, while spangles have the hole located at the top. Palettes' themselves are commonly very large and flat. Sequins may be stitched flat to the fabric, so that they do not move, and are less likely to fall off; or they may be stitched at only one point, so that they dangle and move easily, to catch more light. Some sequins are made with multiple facets to increase their reflective ability.

Sequin

G Mirror Work

Mirror work has been in vogue for centuries and is popularly known as "Sheesha" or "Abhala Bharat" embroidery. This is an art form in which mirrors of various shapes are fixed on to the fabric through embroidery. In recent times however, mirrors have been replaced by reflective luminescent metal pieces of different shapes and sizes, particularly on apparel.Mirror work is used on various fabrics such as georgette, crepe, cotton, silk, chiffon and many more which are then turned into attractive apparel and accessories ranging from sarees, to cushion covers and belts.

Mirror work case

Mirror work can brighten up a dull mono-colored fabric by producing a shimmering design that makes it more appealing. Sheesha or mirror embroidery is traced back to 17th century in Iran and it is said to have been brought to Indian through various travelers during the Mughal era. The mirrors are affixed on to the fabric by special cross stitch embroidery that encloses the mirror and provides it a casing. This cross-stitch embroidery is not only relegated to affixing the mirrors, but they are also used on the garment as well to enhance the overall appeal of it. Although the most popular shape of the mirror that is used commonly is circular, there are other geometrical shapes such as square, triangular, hexagonal and polygonal that are used for embroidery.Mirror or Shisha embroidery as we find it today actually originated in the 17th century and was originally done by using Mica. It which was later replaced by glass. The use of these decorative embellishments was inherited from Iran during the Mughal reign.

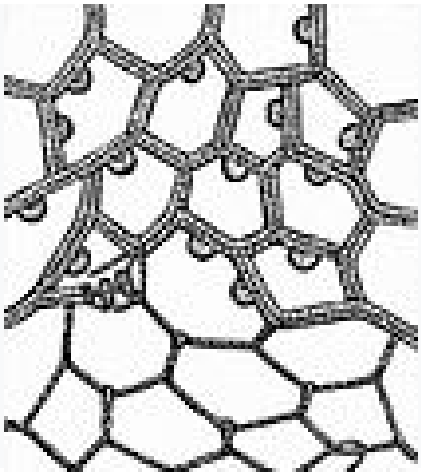
7.2 Lace

A fine open fabric of cotton or silk, made by looping, twisting, or knitting thread in patterns and used especially for trimming garments.

There are many types of lace, classified by how they are made. These include:

- **Needle lace**, such as Venetian Gros Point, is made using a needle and thread. This is the most flexible of the lace-making arts. While some types can be made more quickly than the finest of bobbin laces, others are very time-consuming. Some purists regard needle lace as the height of lace-making. The finest antique needle laces were made from a very fine thread that is not manufactured today.
- **Cutwork** or white work, is lace constructed by removing threads from a woven background, and the remaining threads wrapped or filled with embroidery.
- **Bobbin lace**, as the name suggests, is made with bobbins and a pillow. The bobbins, turned from wood, bone, or plastic, hold threads which are woven together and held in place with pins stuck in the pattern on the pillow. The pillow contains straw, lace. Chantilly lace is a type of bobbin lace.
- **Tape lace** makes the tape in the lace as it is worked or uses a machine- or hand-made textile strip formed into a design, then joined and embellished with needle or bobbin lace.
- **Knotted lace** includes macramé and tatting. Tatted lace is made with a shuttle or a tatting needle.
- **Crocheted lace** includes Irish crochet, pineapple crochet, and filet crochet.
- **Knitted lace** includes Shetland lace, such as the "wedding ring shawl", a lace shawl so fine that it can be pulled through a wedding ring.
- **Machine-made** lace is any style of lace created or replicated using mechanical means.
- **Chemical lace**: the area to be stitched, is stitched with embroidery threads that form a continuous motif. Afterwards, the stitching areas are removed and only the embroidery remains. The stitching ground is made of a water-soluble or non-heat-resistant material.

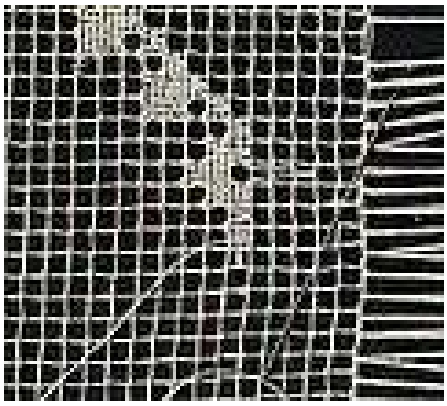
. The stitching ground is made of a water-soluble or non-heat-resistant material.



Needle lace, showing button hole stitch

Bobbin lace made on a pillow with bobbins and pins

Broderie anglaise, a type of cutwork



Filet lace, embroidered on an existing net

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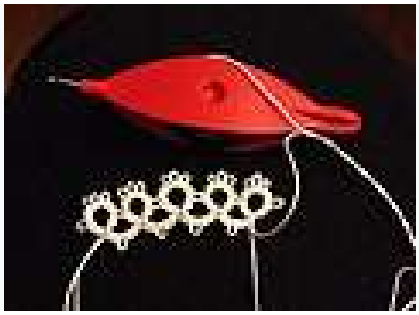
Lace knitting

- 

I. Test your understanding

State if the following statements are TRUE or FALSE

1. Surface ornamentation plays an important role in design (T/F)

2. Painting be done by machine (T/F)

3.Sequins are made of plastic (T/F)

4. A varied effect can be obtained by using wonderful colors. (T/F)

5. Machine-ma**de** lace is any style of lace created by hand (T/F)

II Test your understanding

Fill in the blanks with correct answers:

1. Bobbin lace as the name suggests, is made with _____ and _____.
2. A ---------- is a disk-shaped bead used for decorative purposes.
3. Every person wants to add value to his/ her----------
4. Mirror work has been in vogue for centuries and is popularly known as ---------- ----------
5. What was, which was later replaced by glass----------

Model Questions

1 What is surface ornamentation?
2What are trims?
3 Explain crochet lace?
4What is a niche market?
5 What are accessories

Long Answer Type Questions

1 What are the different types of laces and their uses?

2Name four types of surface ornamentations.

3What is the importance of fabric trims?

4 Name four traditional embellishments?

5Design a dress with sequins and mirror embellishment

6 How is the market influenced by surface ornamentation?

Answers

I Test your understanding:

1. True 2.False 3. False 4True 5. False

II Test your understanding

1. Bobbin and pillow 2. Sequin 3. Garment 4. "Sheesha" 5. Mica

UNIT 8

Basics in Computer Designing

Structure

8.0 Introduction

8.1 How to use MS word

8.2 Importance of power point presentation and usage

8.3 Summary

Learning Objectives

After studying this unit, a student will be able to,

. Understand the importance of computer

. How to use MS word

. Importance of power point presentation and usage

8.0 Introduction

A CAD/CAM will be an introduction to the techniques, processes and commercial applications of digital imaging for the fashion industry and in portfolio development. The course will commence with the basics of Microsoft Office with the understanding of MS Word and PowerPoint. The course will provide knowledge of basic and intermediate techniques and create visuals and texts, using Corel Draw.This software would also help to explore how fashion uses visual communication and image for marketing its product.

B.SYLLUBUS OUTLINE

- Presentations demonstrating all CAD/CAM tools used in the industry
- Presentations showing various graphical layouts and presentation layouts
- Demonstrations to depict the use of vector and raster images in presentations

C COMPUTER BASICS

What is a Computer?

An electronic device that stores, retrieves, and processes data, and can be programmed with instructions. A computer is composed of

hardware and software and can exist in a variety of sizes and configurations.

Hardware and Software

The term hardware refers to the physical components of your computer such as the system unit, mouse, keyboard, monitor etc. The software is the instructions that makes the computer work.

Software is held either on your computer's hard disk, CD-ROM, DVD or on adiskette (floppy disk) and is loaded (i.e. copied) from the disk into the computers RAM (Random Access Memory), as and when required.

Types of Computers

Mini and Mainframe Computers Very powerful, used by large organisations such as banks to control the entire business operation. Very expensive!

Personal Computersare cheap and easy to use. Often used as stand-alone computersor in a network. May be connected to large mainframe computers within big companies.

Hardware Components

Input Devices -- "How to tell it what to do "- A keyboard and mouse are the standard way to interact with the computer. Other devices include joysticks and game pads used primarily for games. Output Devices -- "How it shows you what it is doing" - The monitor (the screen) is how the computer sends information back to you. A printer is also an output device.

INPUT DEVICES: TheMouse isused to 'drive' Microsoft Windows. The keyboard is still the commonest way of entering information into a computer TrackerBalls an alternative to the traditional mouse and often used by graphic designers

INPUT DEVICES

Scanners: A scanner allows you to scan printed material and convert it into a file format that may be used within the PC TouchPads. A device that lays on the desktop and

responds to pressure Light Pens. Used to allow users to point to areas on a screen Joysticks. Many games require a joystick for the proper playing of the game.




Hardware Components



OUTPUT DEVICES

- The computer screen is used to display information in an understandable format to the Printer.
- There are many different types of printers.
- In large organizations laser printers are most commonly used due to the fact that they can print very fast and give a very high quality output .

OUTPUT DEVICES

Plotters

A plotter is an output device similar to a printer, but normally allows you to print larger images.

Speakers

Enhances the value of educational and presentation products.

Speech synthesisers

Gives you the ability to not only to display text on a monitor but also to read the text to you

Storage Devices -- "How it saves data and programs "

Hard disk drives are an internal, higher capacity drive which also stores the operating system which runs when, you power on the computer.

"Floppy" disk drives allow you to save work on small disks and take the data with you.


Hard Disks

- Speed
- Very fast

The speed of a hard disk is often quoted as "averageaccess time" speed, measured in milliseconds. The smaller this number the faster the disk.

- Capacity:

Enormous! Often 40/80 Gigabytes. A Gigabyte is equivalent to 1024 Megabytes.

- Cost:

Hard disks costs are falling rapidly and normally represent the cheapest way of storing data.

Main Parts of Computer
Memory -- "How the processor stores and uses immediate data “

- RAM - Random Access Memory

The main 'working' memory used by the computer.

When the operating system loads from disk when you first switch on the computer, it is copied into

- ROM – Read Only Memory

Read Only Memory (ROM) as the name suggests is a special type of memory chip that holds software that can be read but not written to.

Software Component

Operating systems software
The operating system is a special type of program that loads automatically when you start your computer.

Applications software
An application program is the type of program that you use once the operating system has been loaded.

Information Network
LAN

- A LAN (Local Area Network) is a system whereby individual PCs are connected together within a company or organization

WAN

- A WAN (Wide Area Network) as the name implies allows you to connect to other computers over a wider area (i.e. the whole world).

8.1 Microsoft Office: Introduction to Microsoft Word

1. Start using Word
2. Format your documents
3. Cut, Copy and Paste content from the same/other documents
4. Insert pictures and clip arts
5. Create Tables and Lists
6. Edit Headers and Footers
7. Check Spelling, Grammar and Word Count
8. Print Documents
9. Insert Page break and Section breaks
10. Track Changes

11. Use Versioning

8.2 Power Point Presentation

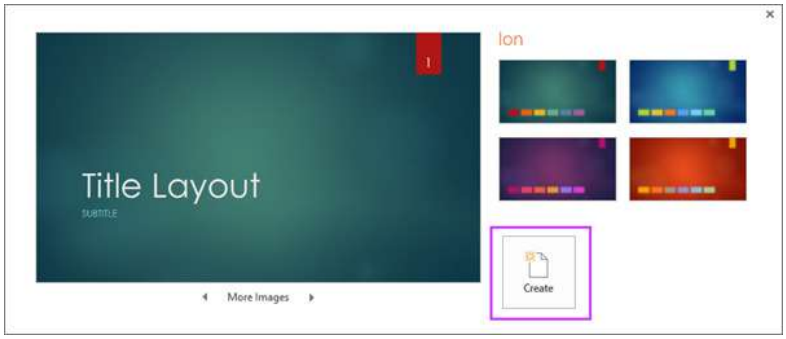
Basic understanding of MS-PowerPoint

When you open PowerPoint, you'll see some built-in themes and templates. A theme is a slide design that contains matching colors, fonts, and special effects like shadows, reflections, and more.

1. On the **File** tab of the Ribbon, select **New**, and then choose a theme.

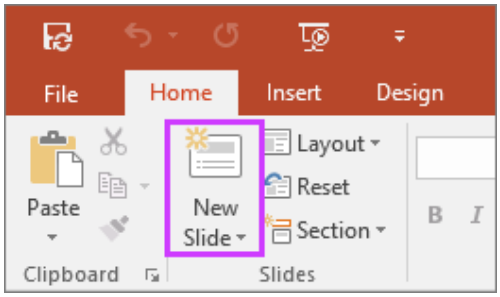
   PowerPoint shows you a preview of the theme, with four color variations to choose from on the right side.

2. Click **Create** or pick a color variation and then click **Create**.



Insert a new slide

- On the **Home** tab, click the bottom half of **New Slide**, and pick a slide layout.

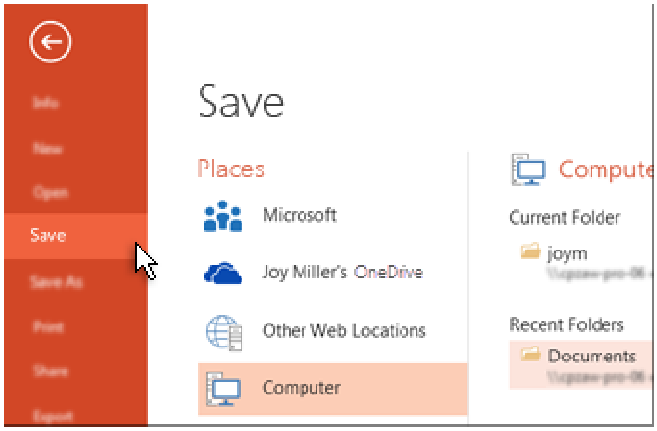


Save your presentation

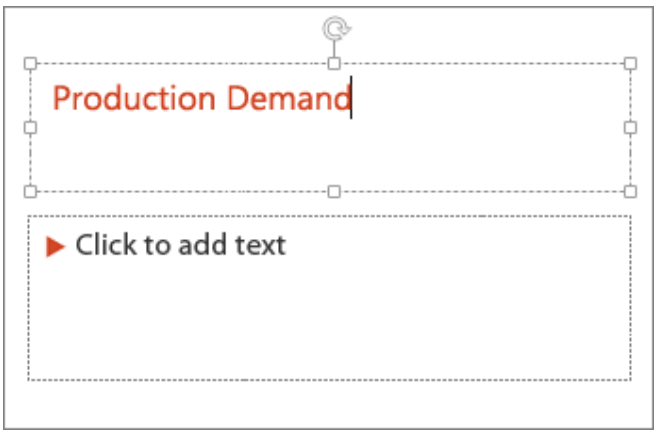
1. On the **File** tab, choose **Save**.
2. Pick or browse to a folder.
3. In the **File name** box, type a name for your presentation, and then choose **Save**.

Note: If you frequently save files to a certain folder, you can 'pin' the path so that it is always available

(as shown below).

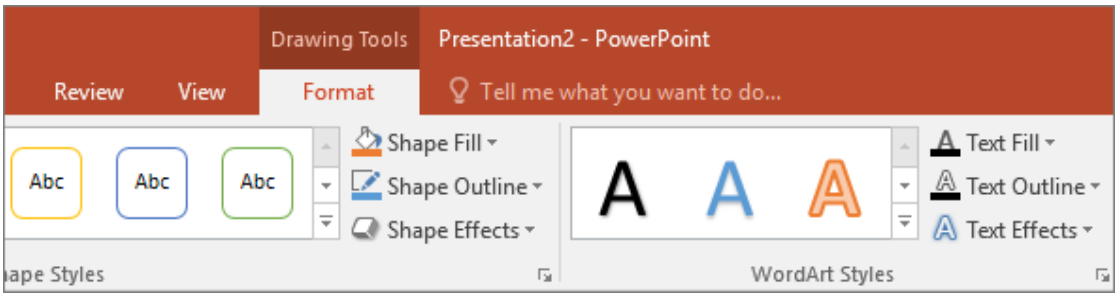


Add text,select a text placeholder, and begin typing.



Format your text

1. Select the text.
2. Under **Drawing Tools**, choose **Format**.



3. Do one of the following:

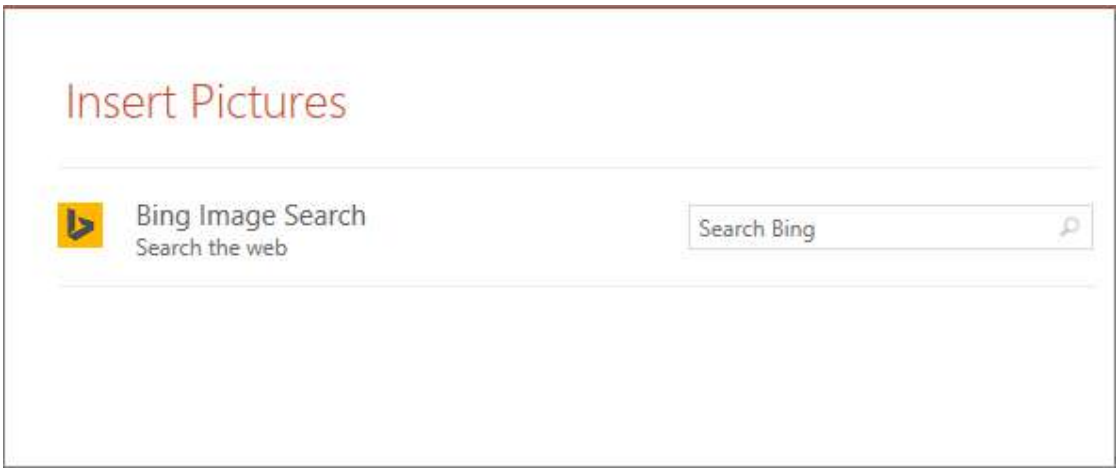
- To change the color of your text, choose **Text Fill**, and then choose a color.

- To change the outline color of your text, choose **Text Outline**, and then choose a color.
- To apply a shadow, reflection, glow, bevel, 3-D rotation, a transform, choose **Text Effects**, and then choose the effect you want.

Add pictures

On the **Insert** tab, do one of the following:

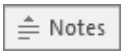
- To insert a picture that is saved on your local drive or an internal server, choose **Pictures**, browse for the picture, and then choose **Insert**.
- To insert a picture from the web, choose **Online Pictures**, and use the search box to find a picture.



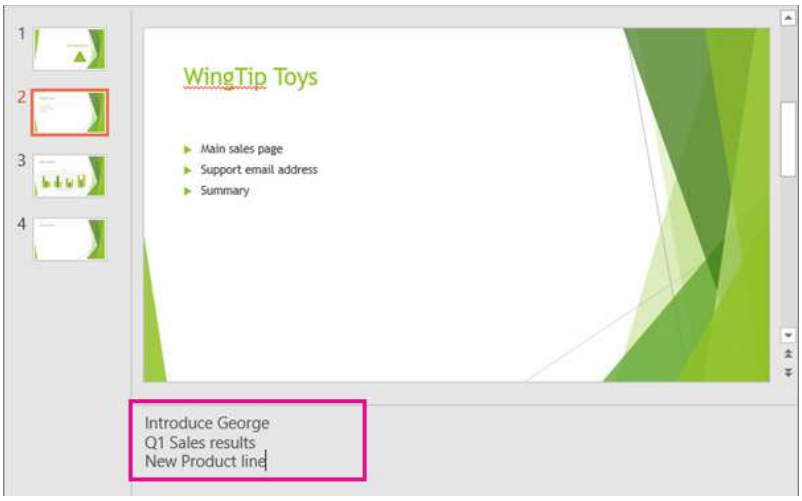
Choose a picture, and then click **Insert**.

Add speaker notes

Slides are best when you don't cram in too much information. You can put helpful facts and notes in the speaker notes and refer to them as you present.

1. To open the notes pane, at the bottom of the window, click **Notes** 

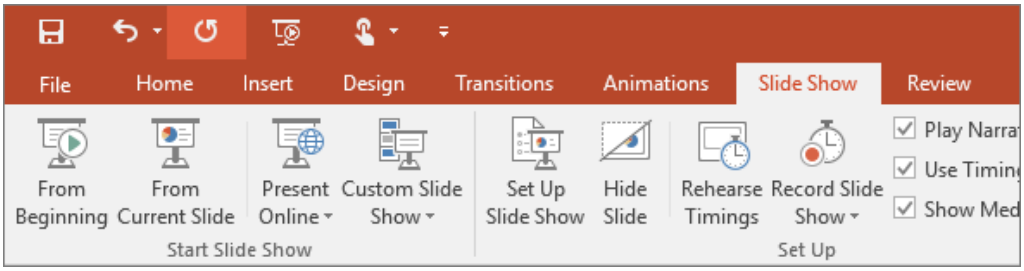
.
2. Click inside the **Notes** pane below the slide and begin typing your notes.



Give your presentation

On the **Slide Show** tab, do one of the following:

- To start the presentation at the first slide, in the **Start Slide Show** group, click **From Beginning**.



- If you're not at the first slide and want to start from where you are, click **From Current Slide**.
- If you need to present to people who are not where you are, click **Present Online** to set up a presentation on the web, and then choose one of the following options:

I. Test your understanding

State if the following statements are True/false

1. CPU controls only input data of computer.
   A. True B. False

2. MS Word is hardware.
   A. True B. False

3. You can only print one copy of a selected text
   A. True B. False

4. We can edit the image in MS word.
   A. True B. False

5. We can animate the slides in ppt.
   A. True B. False

II. Test your understanding

Fill in the Blanks with correct answers.

1. The first row of the window is called the _____

2. A _____ is a device that is used to manipulate objects in window

3. The _____ window contains information about your computer drives.

4. A _____ is a collection of buttons that represents commands

5. A group of computers connected together for the purpose of sharing resources is called _____

6. GUI =_____

III. Short AnswerType Questions

1. How will you create a new folder on desk top?
2. Write the steps to copy a text in one file to another file.
3. What is watermark?
4. Explain the alignment in word.
5. How can you change the desktop wallpaper?
6. What is the difference between moving and copying a file?
7. How do differ the files and folders?
8. What is hardware and software?
9. How to add music in PPT slide?
10. What is Header and Footer?

IV. Long Answer Type Questions

1. How to create PPT Write with steps?
2. Why CAD used in Fashion Designing?
3. Write 10 Short cuts keys in MSWord.

4. What is the difference between save and save as?
5. What is Drop cap and Text wrap?

Test your understanding

Answers

I. True/false

1. A
2. B
3. B
4. B
5. A

II. Fill in the Blanks

1. Title bar
2. Mouse
3. My computer
4. Toolbar
5. Networking
6. Graphical User Interface

FASHION GARMENT MAKING

BLUE PRINT

I YEAR

PAPER-I FUNDAMENTALS OF GARMENT CONSTRUCTION THEORY

Periods/Week : 05 TIME SCHEDULE, WEIGHTAGE AND BLUEPRINT Periods/Year :135 135

S.No.	Name of the Unit	No.of Periods	Weightage in Marks	Short Answer Questions	Long Answer Question
1	Sewing equipment and tools	10	2		
2	Sewing machine				
3	Hand sewing techniques:				
4	Seams and seam finishes:				
5	Creating fullness in garments				
6	Placket Openings:	15	8		
7	Neckline finishes	15	8		
8	Types of Fasteners	15	8		
9	Importance of paper patterns	10	8		
10	Body measurements	10	2		
	Total				

FASHION GARMENT MAKING

BLUE PRINT

I YEAR

PAPER-II FUNDAMENTALS OF TEXTILES

Periods/Week : 05 TIME SCHEDULE, WEIGHTAGE AND BLUEPRINT Periods/Year : 135

S.No.	Name of the Unit	No.of Periods	Weightage in Marks	Short Answer Questions	Long Answer Question
1	Textile terms and definitions				
2	Classification of fibers				
3	Origin & manufacture of natural fibers				
4	Origin manufacture manmade & Regenerated				
5	Types of yarns				
6	Importance of Knitting & Weaving	15	8		
7	Loom & its parts	15	8		
8	Fabric finishes & fabric defects	10	8		
9	Stain Removal	10	8		
10	Dry cleaning process	10	2		
	Total				

FASHION GARMENT MAKING

BLUE PRINT

I YEAR

PAPER-III FASHION & APPAREL DESIGNING

Periods/Week : 05 TIME SCHEDULE, WEIGHTAGE AND BLUEPRINT Periods/Year : 135

S.No.	Name of the Unit	No.of Periods	Weightage in Marks	Short Answer Questions	Long Answer Question
1	Introduction to Design	20	8		
2	Color concepts				
3	Introduction to elements of fashion				
4	Designing Process				
5	Designers of India				
6	Fashion and fabric information	15	8		
7	Fashion trims	15	8		
8	Basics in computer designing	10	8		
	Total				

MODEL QUESTION PAPER
FASHION GARMENT MAKING
1ST YEAR
PAPER-I :: FUNDAMENTALS OF GARMENT CONSTRUCTION THEORY

Time:3hrs Max.Marks:50

SECTION-A 10 x 2 = 20

Note: (i) Answer all questions.

(ii) Each question carries two marks.

1 Mention the general tools used in garment construction

2 How do you thread the sewing machine?

3 Write about uneven and even stitches

4 What is a bound seam? Where do you use it?

5 List out the tucks used ingarments.

6 Where do you use tailoredplacket?

7 Write about biasfacing.

8 Write about pressbuttons.

9 What are the types of paper patterns used in garment construction?

10 How do you take round chest measurements?

SECTION-B 5 x 6 = 30

Note: (i) Answer any **FIVE** questions.

(ii) Each question carries **SIX** marks.

11 Explain in detail the measuring tools used in garment construction.

12 Write about the minor defects and their repair in sewing machine.

13 Write about the various permanent stitches in hemming.

14 Explain with the help of a diagram about french seam and run and fellseam.

15 What is fullness? Explain about gathering and ruffles.

16 Write about continuous placket and indicate its usage.

17 How do you finish neckline with bias binding & facing?

18 Explain the contents of paper patterns and its uses?

MODEL QUESTION PAPER
FASHION GARMENT MAKING
I YEAR
PAPER-II FUNDAMENTALS OF TEXTILES

Time:3hrs Max.Marks:50

SECTION-A 10 x 2 = 20

Note: (i) Answer all questions.

(ii) Each question carries two marks.

1 What is hydrophobhic?

2 What is a filamentfibre?

3 List out the types of yarns.

4 Write any four physical properties of linen.

5 List out the types of synthetic fiberes.

6 Write about any four chemical properties of cotton.

7 What is spinning?

8 What are the chemicals required for manufacturing rayon?

9 Write about yarn twist.

10 Write about laced fabrics.

SECTION-B 5 x 6 = 30

Note: (i) Answer any **FIVE** questions.

(ii) Each question carries **SIX** marks.

11 Explain in detail the physical and chemical properties of silk.

12 Explain the classification of textile fibres.

13 Write about simple yarn, double yarn and ply yarn.

14 Write in detail loom and its parts .

15 Write about mechanical finish- calendaring

16 Write about the following ,yarn twist and yarn count.

17 Explain in detail the process of mercerization finish .

18 Explain in detail the physical and thermal properties of rayon.

MODEL QUESTION PAPER
FASHION GARMENT MAKING
I YEAR
PAPER-III FASHION & APPAREL DESIGNING

Time:3hrs Max.Marks:50

SECTION-A 10 x 2 = 20

Note: (i) Answer all questions.

(ii) Each question carries two marks.

1 What are the elements ofdesign?

2 What is Rhythm?

3 Write about silhouette

4 Write about surface ornamentation

5 Write about fashion magazine?

6 What is harmony?

7 Mention the primary colors

8 Who is a fashion designer?

9 What is a trim ?

10 List out fashion services

SECTION-B 5 x 6 = 30

Note: (i) Answer any **FIVE** questions.

(ii) Each question carries **SIX** marks.

11 Explain in detail about introducing texture indesign.

12 Explain about emphasis in appareldesigning.

13 Write about any two colorharmonies.

14 Explain the classification offashion.

15 Illustrate a design basing on 'beachwear'

16 How do films and news papers promotefashion?

17 Write about fashiontheories

18 Write about any two fashion designers and their work in fashionindustry