UNIT -1

SEWING MACHINE

SEWING TERMINOLOGY

1. **Anchoring stitches**-These are machine stitches that are sewn with zero stitch length, to keep from pulling out. This term can also be used to refer to when you stitch backwards for a couple of stitches, to anchor it.

2. **Applique**-This comes from the French word "appliquer," which means to apply or put on. In sewing, applique is used to describe the process of applying one kind of fabric on top of another layer of fabric. This is fixed into place by sewing or by another fusing means. It can also refer to a surface embellishment.

3. **Armscye**-The opening in a bodice to which the sleeve is attached; also known as an armhole.

4. **Basting**-Basting stitches are temporary long running stitches, made by machine or hand, that hold fabric together before the final permanent stitching.

5. **Bias** -Bias refers to the diagonal of the fabric; a cut that's made diagonally across the crosswise and lengthwise grain of the fabric. This is a 45 degree angle to the gain line, or diagonal direction of the fabric.

6. **Blanket stitch-**A hand stitch used for finishing a fabric edge.

7. **Buttonhole**-A small cut in the fabric that is bound with small stitching. The hole has to be just big enough to allow a button to pass through it and remain in place.
8. **Casing** -A folded over edge of a garment, which is usually at the waist. It is used to enclose a way of adjusting the fit – for example for a drawstring.

9. **Clip-**To help flatten a curved seam, snip at even intervals along the inner curve, being careful not to cut into the stitch line.
10. **Crossgrain**-The line of fabric perpendicular to the selvage edge of the fabric.

11. **Dart -** A dart is a folded wedge of fabric used to shape a garment, particularly over curves. They normally appear around the waist and bust.

12. **Darn (or darning)-**Usually refers to the repair of a small hole, most often in knitwear, using a needle and thread. It is often done by hand, using a darning stitch. It can also refer to any number of needlework techniques that are worked using darning stitches.

13. **Ease** -The allowance of space in a pattern for fit, comfort and style, over exact body

measurements. For example, a garment with a 40" bust made to fit someone with a 38" bust would have 2" of positive ease.

14. **Edge stitch** -Straight stitching very close to the edge of a seam, trim or outer edge. This is usually sewn to keep pressed seams in place

15. **Facing** -A fabric piece used to create a finished edge on a garment, mirroring the edge it is sewn to and creating a enclosed edge. Typically used for necklines, edges with closures, or armholes.

16. **French seam** -A French seam is a finished seam in which the seam is initially stitched with wrong sides together, then flipped inside and stitched right sides together. This encloses the seam allowance, creating a clean finish on the inside of the garment.

17. **Face**-The front of a piece of fabric (the *right* side).

18. **Gather** -A way of gathering the fabric to create fullness in the fabric, such as ruffles. It is a technique for shortening the length of a strip of fabric, so that the longer piece can be attached to the shorter piece.

19. **Grain**-Grain describes the direction of the warp and the weft in a woven fabric. The threads in a woven fabric are set up on a loom in a lengthwise and crosswise orientation. The lengthwise grain is used to lay out the garment pattern pieces. The crosswise grain runs from one selvage edge to the other.

20. **Grain line**-The imaginary line running lengthwise on the fabric, always parallel to the selvage edge. The grain line is marked on pattern pieces with a straight line, usually with arrows at either end, and marked as "grain line" or "straight grain."

21. **Grading** -After a seam is stitched, the two layers are trimmed to a different width in order to prevent a ridge showing on the outside of the garment seam. A second definition of Grading is the process of converting a pattern size to a larger or smaller size.
22. **Hem** -The finished bottom edge of a garment. The hem indicates the edge which is usually folded up and sewn, thus creating a neat and even finish.
23. **Interfacing**-A term for a textile used on the unseen (wrong) side of fabrics. They support and stabilise the fashion fabric of the garment.
24. **Lining**-A piece of material used to finish the inside of a garment. Linings can hide the seam and make the garments easier and more comfortable to wear.

25. **Notch**-The notches on a pattern help align the pattern pieces when you sew them together. Another type of notch is one that is added when sewing the outside edge of a curved seam. These notches are added by cutting wedge shapes into the seam allowance at even intervals, being careful not to cut into the stitching.
26. **Pattern**-A template on paper or cardboard from which all of the pieces of the garment

are traced onto fabric. All the parts are then cut out and assembled to create the final piece.

27. **Pintuck** -A narrow, stitched fold of fabric. This style is usually seen in multiples and creates a stylish and smart finish.
28. **Pleat** -A type of fold in the fabric created by doubling the material back on itself and securing it in place. When ironed, they create a sharp crease.
29. **Seam-**The line where 2 pieces of fabric are held together by the thread.
30. **Seam allowance-**This is the width of the fabric beyond the seam line. The standard seam allowance is normally 1.5cm.
31. **Selvedge-**The woven edge of the fabric that runs parallel to the lengthwise grain – also called "selvage." They are the finished edges that do not fray.
32. **Staystitch** -Stitching placed on or just outside the seamline, stitched on a single layer of fabric. It is used to stablise the fabric and prevent it from stretching out of shape.
33. **Topstitch** -Topstitching is a row of stitches seen on the outside of a garment. They can be decorative and also add strength and wearing ability to an item.
34. **Under stitch**-A row of stitching that attaches the facing to the seam allowance on the inside of the garment.
35. **Warp**-The lengthwise thread in woven fabric.
36. **Weft**-The crosswise threads in woven fabric.
37. **Yardage**-A term for an undefined length of fabric. Patterns will indicate required yardage needed for a garment in a specific size, detailing how much yardage is needed.
38. **Yoke**-A panel across the shoulders or the waistline.

TYPES OF SEWING MACHINE

Though there are different types of sewing machine but mainly, three types are considered for sewing, as given below.

1. Mechanical sewing machines

2. Electronic sewing machines

3. Computerised sewing machines

1. Mechanical sewing machines -These machines are less expensive and are the simplest type of sewing machines in terms of build. They are the hand-operated sewing machine and treadle sewing machine.

Hand-operated sewing machine

(i) This is the simplest form of domestic sewing machine which is operated by hand.
(ii) A handle is attached to the flywheel which is detachable and is used to operate the machine.
(iii) A hand-operated sewing machine is generally used for domestic purpose for simple projects as it does not work very speedily.

(iv) This machine is suitable where there is no electricity supply

Treadle sewing machine

(i) This machine is the same as a hand-operated sewing machine but it is operated by feet, with an additional stand attached to the machine.
(ii) A belt is attached to the lower stand passing through the balance wheel and driven by feet.
(iii) These machines run faster than the hand-operated sewing machine.
(iv) This machine is also suitable for the places where there is no electric supply.
(v) When handling the treadle sewing machine, both the hands of the Operator are free to handle the fabric. Hence, this speeds up the work of sewing.

2. Electronic sewing machine

These machines became popular during the 1970s. There are many more features in an electronic sewing machine than in a mechanical sewing machine.

(i) These sewing machines run faster than manually operated machines.
(ii) In the electronic machines, balance wheel comes to motion by a belt, which is attached to an electric motor.
(iii) A single motor is attached to the electronic sewing machines and this motor supplies power to the needle.
(iv) It is essential to control the speed of this machine by putting pressure on an electronic foot pedal.
(v) Practice is essential to handle an electric sewing machine.

3. Computerised sewing machines

(i) These sewing machines are very fast and specific to use.
(ii) These machines are similar to the electronic sewing machines. However, a computerised sewing machine works with the help of various softwares.
(iii) Computerised sewing machines allow the Operator to tailor the functions according to the sewing needs.

A computerised sewing machine functions very appropriately in designing and stitching various components of the garment like sleeves, yokes, pockets, etc. These advanced computerised machines have an LED display or LCD display or touch screen. They are multi function machines and are expensive.

The following are some other types of sewing machines according to their specific applications.

(i) Lock stitch machine
(ii) Chain stitch machine
(iii) Double chain stitch machine
(iv) Buttonhole machine
(v) Button stitch machine
(vi) Bar-tack machine
(vii) Feed off arm machine
(viii) Over-lock machine
(ix) Blind stitch machine
(x) Over-edge machine

SEWING MACHINE: PARTS AND THEIR FUNCTIONS

The basic parts of a sewing machine are:

1. **Spool pin** is a metal rod placed on the top of the machine for correct positioning of the reel of thread.

2. **Thread guide** takes the thread from the spool pin to the needle through a small hole. It holds the thread in position from the spool to the needle. It smoothens the thread and protects it from abrasion.

3. **Tension disc** is a combination of two concave discs placed together with the convex sides facing. From spool pin, the thread passes through the thread guide, then between the tension discs to the needle. Tension discs control the delivery of the upper thread from the spool to the needle. The tension of the thread is adjusted by a spring and nut which decreases or increases the pressure.

4. **Thread take-up** lever is a lever fitted to the body of the arm located above the tension disc. It receives its up and down motion from the front axle. At the outside end of the lever, there is a small hole through which the thread passes. The take-up lever first loosens the top thread during the stitch formation, and then removes any slack to set or lock the stitch.

5. **Needle bar** is a metal rod to hold the needle at one end with the help of a clamp. Its main function is to give motion to the needle.

6. **Presser foot** is a detachable device for holding the material in place on the feed dog while stitching. This device is not used when attachments for tucks, ruffles or embroidery are used.

7. **Presser foot lifter** is the lever attached to the presser bar (located inside the face plate) to control the up and down movement of the presser foot. It must always be lifted up to take out the material from the machine.

8. **Stitch regulator** controls the length of the stitch.

9. **Bobbin winder** is a device which helps in winding the bobbin (located inside the slide plate) properly. The thread passes through it tightly or loosely, as desired.

10. **Fly wheel** (or balance wheel) is a round wheel located at the upper right of the sewing machine. This is made to revolve the machine. It controls the motion of the machine manually or electrically.

11. **Slide plate** is a rectangular plate, which facilitates the removal of the bobbin case without lifting the machine top.

12. **Needle plate or throat plate** is a semi-circular disc with a hole to allow the needle to pass through it. The fundamental purpose of this plate is to provide a levelled surface for the material and to prevent the dust from entering the inner parts of the sewing machine.

13. **Feed dog** consists of a set of teeth fitted below the needle plate. When the machine is in motion, the feed moves upwards, thus advancing the material as each stitch is made. It helps to move the material forward while sewing.

14. **Face plate** is a cover, which when removed, gives access to the oiling points on the needle bar, presser bar and take-up lever. 1

5. **Arm** is a horizontal part of the head that houses the drive shafts.

16. **Check spring** is a small wire spring behind or at the top of the tension discs. It provides a little amount of tension on the thread of the needle and acts a shock absorber.

17. **Slack thread regulator** is a metal hook near the tension discs.

18. **Bobbin case** is fixed in the shuttle case placed in the bottom chamber (the hollow space under the slide plate) of the sewing machine and moves into position to catch the top thread and form the stitch as the needle is lowered into the bobbin case. The lower tension of the thread can be adjusted (by loosening or by tightening) by a small screw fixed on the bobbin case.

19. **Clutch or thumb screw** is in the centre of the fly wheel and it engages and disengages the stitching mechanism.

20. **Rubber ring** is a ring on the bobbin winder which comes in contact with the nut of the balance wheel. This should never be allowed to become oily, as it will make it slippery and will not be able to make proper contact with the balance wheel.

21. **Bobbin winder tension angle** is a device situated near the bobbin winder which helps to wind the bobbin evenly.

22. **Needle clamp** is a screw that is tightened to hold the needle in position.

23. **Handle driver** is attached to the handle attachment of the machine and helps to drive it with hand.

24. **Shuttle** holds the bobbin case and moves to form the loop as the machine is operated. It is fitted below the feed dog or to its left side.

25. **Treadle drive** is a large wheel located under the board in the treadle machine. It is connected to the balance wheel with a leather belt. As it rotates, the power is transmitted to the balance wheel by the leather belt.

26. **Treadle** is the foot rest at the base of the treadle machine which is pressed with the feet to operate the treadle machine.

27. **Pressure regulating screw** is the screw above the presser bar, which can be tightened to increase the pressure on the fabric when stitching with fine/ lightweight fabric and loosened to accommodate thick fabric.

CARE AND MAINTENANCE OF SEWING MACHINE

Introduction

The care and maintenance of a sewing machine helps to improve its working. This consists mainly of cleaning, oiling, and right handling, which contributes to good output, quality production and safety of the workers. Care and maintenance is also necessary in order to operate the machine smoothly and for its long term use.

Cleaning, Oiling and Handling of Sewing Machine

A clean, well-oiled sewing machine is essential for good output and safety. The maintenance of sewing machine is also important in preventing stitching faults. When not in use, keep the machine covered with a suitable cover to prevent dust from settling on it. In some organisations, this is done by the operators but in others, it is done by a mechanic.

Cleaning of sewing machine

While cleaning the machine, pay attention to the various parts of the machine, the machine table or stand, the work station, and even your hands, to avoid soiling the material being sewn, prevent accidents and damage to the machine. These directions mainly hold true for the lockstitch machine, but they can easily be adapted to other machine types also. The machine should always be kept covered when not in use to protect from dirt and dust. Before attempting to clean the machine, it is wise to remove the needle to avoid the danger of sewing into the finger during the cleaning process.

Material required for cleaning

1. Flat paintbrush (½" to ¾" wide)

2. Cleaning solvent or fluid

3. Soft disposable cloth

4. Screwdriver

5. Sewing machine manual

6. Small handy vacuum cleaner

All dust and dirt can be removed by wiping the part out carefully with the cloth, but if the machine is clogged, a more careful cleaning is necessary. Common tools like a small dry brush or old toothbrush or compressed air and a soft cloth are used to remove dust and lint.

Points to be considered while cleaning

1. Before cleaning any machine, turn it off.

2. Open the slide plate and remove the bobbin case. Then remove the throat plate. Whenever it is required, remove the face plate from the left end of the head.

3. Any lint, dust, or loose threads in the area around the feed dog and rotary hook, shuttle may be brushed or blown away. Do not use anything hard, such as a screwdriver or scissors points, to remove the lint. Instead, carefully use a pointed instrument like a needle or pointed tweezers/plucker to pick out bits of thread and lint that cannot be brushed out.

4. Turn the hand wheel manually to expose any areas that might have been hidden initially. Brush again.

5. Carefully tilt the machine head back until the head rests on the post on the back of the table.

6. Brush out any lint, dust, or threads from the lower part of the machine.

7. Use a soft, thin and clean cloth to remove any lint on the machine parts.

8. Unscrew all plates and screws and the bobbin case.

9. Check the needle to be sure it is clean and the eye is not clogged.

10. Replace the needle, if necessary.

11. Wipe away any excess oil or dust on the head, machine bed, motor, table, and stand.

12. If there is lint between the tension discs and in the thread guides, use thread to floss the tension discs and remove any lint.

13. If you have oiled the machine, sew on few scraps to remove any excess oil.

14. Wash hands after cleaning and oiling the machine.

15. After completing the work, put a piece of fabric under the foot, lower the presser foot, cover the machine, and pick up any trash.

16. For cleaning the machine, it is good to clean one Notes area at a time. Remove only those parts that are detachable, and keep in mind the position and direction of each part that is removed for cleaning. Keep the parts in order to make it easier to attach them.

17. When using a screwdriver, apply pressure on the screw, if a screw does not loosen easily. Soak it in a good quality cleaning fluid available in the market for the sewing machine. Petrol or kerosene can also be used as cleaning fluids. Then set the screwdriver in the slot to loosen the screws if required.

18. Remove all the parts that is, the needle, presser foot, slide plate, throat plate, bobbin case, and the face plate. Put them in the tray and soak in cleaning fluid.

19. Wrap the motor to protect it from oil and cleaning solvent. Ensure that the sewing machine has been unplugged.

20. To clean the feed dog, remove the needle plate of the machine and brush off all lint deposits and dirt sticking to different parts.

21. To clean the shuttle case, remove all the screws holding the shuttle case. Take out the shuttle case and wipe its groove free of dirt, and thread bits.

22. Sometimes loose threads wind around the pivots of the treadle and make the sewing machine hard to run. Thread bits must be removed which are caught in the wheel along with all lint and dust sticking to the treadle parts.

23. Use a cloth or small brush to clean near the needle and feed dog.

24. If the machine starts to run hard, it is an indication that dirt or lint is jammed inside a bearing. In that case, remove the bobbin case to remove all lint and stray threads. Continuously run the machine and flush it with the cleaning fluid until the dirt and gummed oil are washed from the bearing

25. The bobbin case can be removed from the sewing machine easily. Use a dry brush to clean out all lint. Remove any thread that may be wound up around the hook shaft. In some machines, the hook assembly can also be removed for complete cleaning.

26. Remove bobbin and bobbin case, and clean small thread particles from there.

27. Pull a piece of cloth soaked in the solvent, back and forth between the discs to clean it from dust, lint or any other particles. Repeat with a dry cloth to make sure that no lint or thread is caught between them. To remove any remaining dirt and oil, dip a cloth or brush in a cleaning fluid and scrub all parts of machine that can be reached. Check the lower tension of the bobbin case and the upper thread tension discs. Pull a thread under the bobbin to remove dirt.

28. Clean the hand wheel, washer, and the shaft. Lubricate the shaft with two drops of sewing machine oil and place a small amount of grease on all gears. Reassemble the hand wheel and clutch. After properly cleaning these areas, reassemble all the parts of the sewing machine and run it. If reassembled correctly, it should run smoothly.

Oiling the sewing machine

Always keep your sewing machine well oiled. All dust should be removed from the exposed parts at least once every week, and the important parts of the machine should be oiled. Use good quality sewing machine oil. Always remove lint deposits, dust and thread bits before oiling any part of the machine. In order to operate the machine smoothly, it is essential to oil it repeatedly. Material required

1. Sewing machine manual

2. Sewing machine oil

3. Soft disposable cloth

Points to remember while oiling the sewing machine

1. Before oiling, ensure that the sewing machine is turned off.

2. Oil the machine using the directions given in the machine manual. Inspect the condition of all visible parts of the machine every time you oil it.

3. If a manual is not available, oil the machine as per the directions of the teacher/instructor as per the required frequency.

4. Locate oil holes of the sewing machine. They are mostly identified by arrows, or red or yellow paint. Put one to two drops of oil into each hole. Too much oil will clog the machine. Turn the hand wheel manually so that the oil will work its way between the parts.

5. Wipe off all dust and excess oil from the machine or table; clean up any spilled oil immediately.

6. Sew on a few fabric scraps to remove any excess oil.

7. Wash hands after oiling the machine.

8. Excess oil is a major problem that can spoil and damage the fabric.

Method for oiling of the sewing machine

It is necessary to oil the sewing machine periodically. If the machine is used everyday, oil it once a week. If you do not use it very regularly, then oiling once a month is sufficient. The frequency of oiling depends on its use, and sometimes on the material sewn. To oil thoroughly, remove the upper thread, needle plate, slide plate, face plate, bobbin case, and needle and presser foot. Put sewing machine oil in all oil holes and joints where one part rubs against another. One or two drops of oil are enough for each point. While oiling, turn the fly wheel back and forth to facilitate the flow of the oil to different moving parts. It is necessary to oil the shuttle case. After oiling the points on the head of the machine, tilt the machine head back to oil the points on the underside. On a treadle machine, the belt will have to be released before tilting the machine head back. Remember to oil the pivots of the treadle. When the machine has been completely oiled, wipe away excess oil and run it slowly for 2–3 minutes on a waste piece of material. Before you close the machine, place a scrap of fabric under the presser foot and lower the needle. The fabric will absorb the excess oil that might drain down through the machine and will prevent the formation of oil spots on your work the next time the machine is used.

If the sewing machine becomes gummed and dirty with oil, put a drop of kerosene or petrol in each oil hole and at joints, and run it rapidly for 1–2 minutes. Then wipe off the oil that oozes out with a soft cloth and re-oil the machine. It will require a second oiling within few hours after this treatment.

Check the machine instruction booklet/manual to determine the types of oil lubricant to use and where to use them. Do not oil the tension discs, the hand wheel release or the belts and rubber rings in any machine. Run the machine so the oil would be distributed into all the bearings. Use oil freely because all oil has been removed in the cleaning process. For later oiling, one drop of oil on each bearing and in each oil hole is enough.

After oiling the sewing machine, wipe away the excess oil and reassemble the machine. The oil used should be of good quality, preferably regular machine oil, as otherwise it may clog the bearings. Care should be taken to see that too much oil is not deposited in, as it is liable to spoil the cloth being stitched. It is advisable to do a few stitches on a waste piece of cloth until clear stitches are obtained.

Care and maintenance of sewing machine Most sewing machines encounter problems that can be traced to poor general maintenance or neglect. But with some simple tools and just a few minutes daily, weekly, or monthly, depending on how much our sewing machine is used, we can help keep our machine running smoothly.

PROBLEMS RELATED TO SEWING MACHINE CAUSES AND REMEDIES

Some of the common defects related to sewing and the sewing machine, the possible causes, and the best possible corrective actions associated with these are.

1. **Defect: The machine does not feed the material.**

Possible causes

(i) The stitch length has been set to zero.
(ii) The presser foot pressure is too low.
(iii) Feed dog is lowered.
(iv) Threads are knotted under the fabric.

Corrective action

(i) Set the proper stitch length.
(ii) Set pressure of presser foot.
(iii) Raise feed dog.
(iv) Remove fabric and knotted threads. Then again place the fabric properly.
(v) Place both threads back under the presser foot before starting to sew.

2. **Defect: Machine running heavily**

Possible causes

(i) Dust or lint clogging under the feed dog
(ii) Insufficient oiling
(iii) Thread caught in the shuttle
(iv) Machine not used for sometime with the result that the parts have jammed

Corrective action

(i) Clean the feed dog.
(ii) Oil the machine properly.
(iii) Remove the thread from the shuttle.
(iv) Disassemble the removable parts, clean and oil them.

3. **Defect: The sewing machine does not run.**

Possible causes

(i) The presser foot is not properly placed and the needle hits the presser foot.
(ii) The needle has come out and is in the shuttle area of the machine.

Corrective action

(i) Place and tighten the presser foot properly.
(ii) Remove the needle and insert a new one again, or place it at the right position.

4. **Defect: The upper thread breaks.**

Possible causes

(i) The threading is not correct.
(ii) The thread has a knot in it.
(iii) The upper thread tension is too tight/high.
(iv) The needle is bent or blunt.
(v) Wrong size of needle
(vi) The needle has been inserted wrongly.
(vii) The needle and thread do not match, and are also not suitable for the fabric to be sewn.
(viii) Started stitching too fast
(ix) Thread take-up lever has not been threaded

Corrective action

(i) Thread the machine correctly.
(ii) Remove knots from the thread.
(iii) Make correct the thread tension.
(iv) Replace with a new needle, of good condition.
(v) Replace with a needle of the correct size.
(vi) Insert the needle properly.
(vii) Use a suitable thread and needle.
(viii) Start the machine at a medium speed.
(ix) Check the threading order.

5. **Defect: The bobbin thread breaks**

Possible causes

(i) The bobbin has not been fully inserted/pushed in the bobbin case.
(ii) The bobbin case has not been threaded correctly.
(iii) The bobbin does not turn smoothly in the bobbin case.
(iv) A lint in the bobbin case or shuttle

Corrective action

(i) Securely install the bobbin in the bobbin case.
(ii) Thread the bobbin case correctly.
(iii) The bobbin should not be overwound.
(iv) Check that the bobbin has been wound evenly.
(v) Clean the bobbin case and shuttle, and remove the lint. Defect: Skipped stitches

6. **Defect: Skipped stitches**

Possible causes

(i) The thread tension is too tight/high.
(ii) The needle is bent or blunt.
(iii) Wrong size of the needle
(iv) The needle and thread do not match.
(v) The thread take-up lever has not been threaded.
(vi) Light pressure on the presser foot
(vii) Incorrect setting of the needle

Corrective action

(i) Correct the thread tension.
(ii) Replace with a new needle of good condition.
(iii) Replace with a needle of correct size.
(iv) Use a suitable thread and needle.
(v) Check the threading order.
(vi) Increase pressure on the presser foot.
(vii) Reset the needle properly.

7. **Defect: The stitches are not formed properly**

Possible causes

(i) The thread has not been pulled into the thread guide.

(ii) Threading is not correct.

(iii) The bobbin case has been threaded wrongly.

Corrective action

(i) Fully pull the thread into the thread guide
(ii) Correct the threading.
(iii) Correctly thread the bobbin case.

8. **Defect: Irregular stitches**

Possible causes

(i) Incorrect size of the needle
(ii) Improper threading
(iii) Loose upper thread tension
(iv) Pulling of the fabric
(v) Light pressure on the presser foot
(vi) Loose presser foot (vii) Uneven or overwound bobbin

Corrective action

(i) Choose the correct size of the needle for the thread and fabrics.
(ii) Rethread the machine properly.
(iii) Tighten the upper thread tension.
(iv) Do not pull the fabric; guide it gently.
(v) Increase pressure on the presser foot.
(vi) Reset the presser foot.
(vii) Rewind the bobbin properly.
(viii) Remove overwinding of the bobbin.

9. Defect: Fabric pucker

Possible causes

(i) The stitch length is too long for the material.
(ii) The needle point is blunt.
(iii) Incorrect thread tension
(iv) Light pressure on the presser foot
(v) The fabric is too sheer or soft.
(vi) Using two different sizes or kinds of upper and lower threads

Corrective action

(i) Decrease the stitch length.
(ii) Replace with a needle of good condition.
(iii) Reset the thread tension.
(iv) Increase pressure on the presser foot.
(v) Use an underlay of tissue paper/backing.
(vi) The upper thread and bobbin thread should be of the same size and kind.

10. Defect: Bunching of thread

Possible causes

(i) The upper and lower threads are not drawn back under the presser foot.
(ii) The placement of the feed dog is down.

Corrective action

(i) Draw both threads back under the presser foot.
(ii) Fit the feed dog properly.

11. Defect: Needle breaks

Possible causes

(i) A thin needle was used for sewing a heavy weight material.
(ii) The needle has not been fully inserted/pushed into the needle bar.
(iii) The screw of the needle clamp is loose.
(iv) The presser foot is not the correct one.
(v) The presser foot is loose.
(vi) Pulling of fabric

Corrective action

(i) Use the correct size of the needle.
(ii) Properly insert/push the needle in the needle bar.
(iii) Securely tighten the needle clamp screw.
(iv) Use correct presser foot.
(v) Reset the presser foot.
(vi) Do not pull fabric; guide it gently.

12. Defect: Loud noise is heard and/or knocking noise; machine jammed

Possible causes

(i) Dust has accumulated in the feed dog.
(ii) Lint is in the hook and shuttle area.
(iii) The thread is caught in the shuttle.

Corrective action

(i) Clean the machine and remove the lint.
(ii) Disassemble the shuttle case and clean it.
(iii) Oil the machine.

13. Defect: Threading cannot be done

Possible causes

(i) The needle is not at the highest position.

Corrective action

(i) Turn the hand wheel until the needle reaches its highest position.

14. Defect: The thread does not enter the eye of the needle.

Possible causes

(i) The eye of the needle is clogged.

(ii) The thread is thick in comparison to the eye of the needle.

Corrective action

(i) Clogging should be removed by using a fine wire.
(ii) Change the needle.
(iii) Select the thread according to the needle.

UNIT -2

BASICS OF APPAREL STYLE

SEWING EQUIPMENT AND TOOLS

INTRODUCTION

Clothing along with food and shelter has been recognized as integral and inseparable part of mankind in all parts of the world. Historical records shows that primitive people were covering and decorating their body with paints, tattooing, mutilation as well as by fur, beads, stones, wood, leaves and barks etc. This was the first attempt that was made to cover the body. The main function of clothing is to provide protection against climatic extremities, means of self expression, aesthetic enjoyment, conformity, to indicate socio- economic status as well as a source of decoration.

CLASSIFICATION OF TOOLS USED IN CLOTHING CONSTRUCTION

Clothing construction requires a variety of tools that can be classified into the following categories:

- Measuring Tools
- Marking Tools
- Cutting Tools
- Fitting Tools
- Sewing Tools
- Finishing / Pressing Tools
- General Tools

Using the right tool will help make the garment construction easier. These tools help increase the accuracy of the finished product, saves time and also simplify tasks.

MEASURING TOOLS

The following are the commonly used measuring tools for garment construction

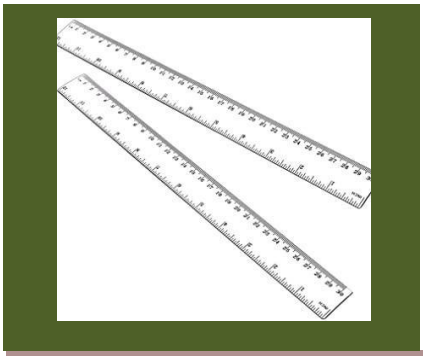
1. **Measuring tape**
2. **Ruler or Yard Stick**
3. **L -square or Tailor's Square**
4. **Hem marker/skirt marker**
5. **Gauge**

Measuring tape

Tape should be of good quality with a smooth surface and with metal tipped ends that prevent the tapes from raveling. At one end of the tape the metal tip is long (3") and is used when vertical measurements are taken. The other end has a short metal tip with a small hole at the centre. This side is used in taking circumference measurements. The small hole aids in drawing circle of perfect measure. Tape is marked with centimeters as well as inches to facilitate the conversion from one system to another. Generally tapes are of 150 centimeters(60 inches) long. The best tape choice is a flexible synthetic or fiberglass, which will not tear or stretch.

Ruler or Yard Stick

Ruler or yard stick is the best device for taking long, straight measurements on paper. Sticks of good quality and that are smoothly finished should be used. Ruler of 15 cm to 30 cm long and yard stick of 1.5 meter scale marked in centimeters and inches are commonly used.



L -square or Tailor's Square

It resembles the letter L – with perfect right angled corner. It is more accurate than ruler and convenient for measuring skirt lengths or straight lines of material before starting pattern layout. It is made of good quality, light weight, smoothly finished hardwood. Sometimes it is available with French curve, useful to mark corners, perpendiculars and curves of the pattern

MARKING TOOLS

1. **Tailor's chalk**
2. **Marking Pencil**
3. **Tracing Wheel**
4. **Dress Maker's Carbon Paper**

Tailor's chalk

Most commonly used dress maker's marking tool is tailors chalk and it is made of either clay or wax. It is available in various colours like white, yellow, blue, red etc with different sizes and shapes which facilitates quick and efficient marking. Wax based tailor's chalk is available in a 2 inch square white colour piece, mainly used for marking woolen fabrics. Tailors chalk is very safe because it does not leave any stain or permanent marking on the material. Light brushing is sufficient to rub off the marked lines completely.

Marking Pencil

These are convenient and precise tools for marking cutting and stitching lines. These are available in white and pastel colours. Since the marking pencil is made of wax, the coloured

lines can be removed by simple washing.

Tracing Wheel

It is used with or without dressmaker's carbon paper to transfer pattern marking onto the fabric. Tracing wheel is about 15 cm in length, having a wheel with saw-like periphery, which is connected by means of stem and at the rear end with a convenient handle. Tracing wheels are available in variety of edges 1)Needle-point wheel, makes a faint line that is desirable on fine thin fabric. 2) A serrated edge produces a prominent line that is good for marking heavy, loosely woven fabric, deep points are more effective on thicker fabric 3) A smooth wheel is recommended for delicate fabric such as velvet and knit that are subjected to snagging and are damaged by other types of wheels. Use of tracing wheel in conjunction with a carbon paper is very safe, because it does not leave any coloured markings, but a line of tiny dots remain which are temporary.

Dress Maker's Carbon Paper

By using carbon paper constructional details such as shape of the pattern, cutting and stitching line can easily be transferred on the material. These are available in white and several colours.

Care to be exercised while using carbon paper.

1. No carbon markings should never be placed on the right side of fabric.
2. No lines to be marked boldly.
3. The colour of the carbon must not show through the fabric.
4. If the garment is underlined, marking may be made on the underlining only.
5. White carbon paper is recommended for colour fabrics, because it is removed easily during cleaning.

CUTTING TOOLS

Scissors and shears are the important tools to the dress maker. Various types and sizes of scissors and shears are designed to perform different constructional work. Common working principles of scissors and shears are similar but their application is different.

Visually one can easily differentiate scissors and shears - shears have one finger ring bigger than the other for better grip while cutting thick or several layers of patterns.
Whereas scissors have identical round finger rings. A separate pair
of scissors or shears should be kept for cutting the cloth and the paper pattern.

The following types of shears and scissors are used in clothing construction.

1. **Shears**
2. **Scissors**
3. **Rotary cutter**

SHEARS

1. **Dress making shears**
2. **Bent-handle shears**
3. **Electric shears**
4. **Pinking shears**
5. **Serrated blade shears**

Dress making shears

Dress making shears are heavy duty scissors which are designed specifically with the needs of seamstresses in mind.The distinguishing feature of dressmaker's shears is that the handle is offset from the blades, allowing them to be used to cut fabric against a flat surface without distortion. In shears, one of the finger rings is typically larger than the other. In industrial terms, the finger rings on scissors and shears are known as “bows”. The large bow of a shear is usually on the side of the blade which points towards the floor when in use. The length of the blade varies from 25 to 30 cm.

The edges of dressmaker's shears are typically ground with a beveled edge and they are extremely sharp. It is important to keep shears, sharp to avoid mangling of the fabric, as specially while cutting multiple layers of fabric at a time for efficient cutting.

Dressmaker's shears are not symmetrical, as they are available in both right and left-handed versions to facilitate comfortable use. It is important to use dressmaker's shears which are engineered for dominant hand, as it reduces the risk of injury and makes work more comfortable. It is also a good idea to try out a pair of shears before use, to make sure that they are comfortable in handling. shears are available in different materials from heavy brass to very light weight materials. Some have rivets at the crossing of two blades.

Bent-handle shears

These shears have straight blades with a handle that is off-set at an angle allowing the lower blade to stay flat on a cutting surface. The design of the handle allows the bottom blade to

rest on the flat surface below the fabric without lifting the fabric from the flat surface. The blade size is less than 15 cm long. Sharp shears are the key to prevent hand fatigue and accurate cutting along pattern lines.

Electric shears

These are used in most sample rooms. Electric shear is a type of hand tool suitable for a variety of cutting applications. They are essentially battery-powered shears Electric shears are also known as power scissors or cordless scissors. They resemble a utility knife with dual crossing blades on the end rather than a single blade, but a few models are designed slightly different. Most varieties are powered by alkaline batteries, but a few are powered by rechargeable batteries. They are ideal for cutting silk, nylon, and soft, hard-to-cut fabric.

Pinking shears

They produce a notched cutting line (zig zag) which gives a neat appearance to the inside of garments, as these shears have saw tooth blades.

These shears are used for pinking seams or decorative edges on felt, suede, chintz, etc. They are used to add a ravel-resistant seam finish to loosely woven fabric. It automatically notches and reduces bulk in seams and creates a decorative finish. Blade lengths range from 7" to 10 1/2" and are available in lightweight models, as well as scalloping shears for a more rounded effect.

Scissors

Scissors are hand operated cutting instruments. They are 5 to 6 inches long, used for light cutting, trimming, clipping corners and cutting curves. They are designed for snipping threads and trimming seams. They are also used for cutting various thin materials, such as paper, cardboard, metal foil, thin plastic, cloth, rope and wire.

1. **Embroidery scissors:**
   These are light weight cutting scissors with 3 to 4 inches in size with narrow blade

tapering into two sharp points. Blades are joined by a pin, screw or rivet and designed with two evenly sized ring handles. These scissors are ideal for clipping and notching, trimming fabric from delicate appliqués, embroidery and snipping thread tails.

2. Button hole scissors:

These scissors are adjusted to cut button holes of required length. They are greatly used when many button holes are to be made. Buttonhole scissors have a special adjustable screw for securing them partially open as per the length of buttonhole required. This open position translates to a precise cutting length (usually between 1/2" and 1 1/4") that prevents cutting of the stitches at the buttonhole end.

3. Trimming scissors:

These are used for trimming or clipping seams and cutting corners, and are generally 15 to 17.5 cm long with narrow blades and tapered sharp points.

4. **Snipping scissors:**
   These are spring-action clippers with or without a finger loop featuring very short blades for cutting thread tails and clipping seams quickly.

Care guidelines while using shears and scissors:

1. Take long strokes using the length of the blades.
2. Do not use fabric-cutting scissors for cutting paper or other non fabric materials.
3. Wipe scissors with dry cloth after each use. This is especially important after cutting polyesters and other synthetics, since lint from these manmade fibers is abrasive and can dull the blades.
4. Keep the cutting blades sharp. Scissors and shears may be sharpened using a professional-style electric sharpener or they may be sent to a professional sharpening service.
5. Occasionally oil the pivot screw with a tiny drop of sewing machine oil. Open and close the blades few times, then wipe the blades with a soft cloth.
6. Don't force a cut -this can deform the blades or spread them permanently.
7. Store scissors or shears in a box or pouch.
8. Never drop shears on the floor, it looses its sharpness.

Rotary cutter

This tool helps in cutting more than five layers of cloth at a time. It is electrically operated having a round circular shaped blade with a guard in the front of the blade. It is generally used in small garment manufacturing units. There are several sizes and types of rotary cutters available. Blade sizes range from 18 mm to 60 mm in diameter. Smaller diameter blades

make cutting out curves and details much easier; whereas the larger-diameter blades make quick work of long, straight cuts.

FITTING TOOLS

French Curve / Tailor's Curve: The main function of the curve stick is to give shape especially at neckline, arm hole, waist, crotch etc. It is made up of good quality wood or plastic with shaped curves marked in inches. Sometimes it is also used for measuring the length of the curve that is shaped.

SEWING TOOLS

The correct selection of sewing thread and needle prior to garment assembly is essential in order to achieve required finish to the garment.

The importance of thread and needle is often under estimated though fundamental to garment construction i.e. forming of stitches and subsequently joining of seams. Without hand and machine needle the construction work is incomplete. Clothing industry has demanded the development of threads and needles of various sizes and shapes to cope up with advanced technology at which the garments are manufactured with minimum machine troubles.

1. **Needle**
2. **Sewing threads**
3. **Sewing aids**

Needle

Needles are classified as follows

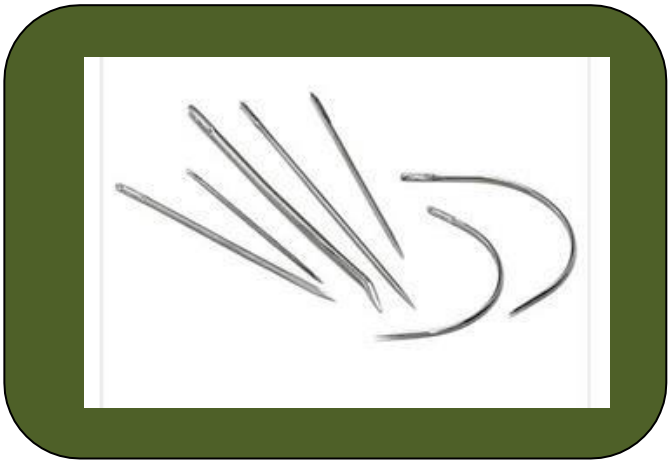
1. **Hand sewing needles**

2. **Machine sewing needle**

1. Hand sewing needles

A hand sewing needle is a long, slender steel shaft, with an eye at one end. The shaft tapers to a fine ball point tip or wedge end. These needles function to carry the thread through the fabric while hand sewing. Needles are designed in a variety of sizes, types, and classifications developed according to specific use.

For each needle type, sizes range from a low number, (coarse needle) to higher number (finer needle). Diameter of the needle shaft increases proportionately at the eye end according to the length and size.



Hand needles are selected according to the following factors

1. Structure of fabric
2. Weight and type of fabric
3. Type of thread
4. Size and weight of thread and
5. Intended use

The needles available for hand sewing are specified below

1. **Ball point needle**
   A needle is designed with a rounded tip and a small round eye, designated as medium length, sizes range from 5 to 10 for knits and lingerie fabrics. Ball point needle slides between the yarns instead of piercing as it penetrates the fabric. It reduces occurrence of holes and runs in fabrics such as jersey and tricot.

2. **Ball point needle**
   This needle is very fine, long with a small round eye used for beadwork, sewing sequins, pearls, etc.

3. **Betweens**

A needle designed with a small rounded eye and designated as short length; sizes range from 1 to 12 to produce short fine stitches as in tailoring, handwork and open work

4. **Crewels/embroidery**
   A needle is designed with a long oval eye and designated as medium length; sizes range from 1 to 12 to carry multiple strands of thread for embroidery.

5. **Chenille**
   Large-eye needle with sharp point for ribbon embroidery,

6. **Darners**
   A coarse needle designed with a large, long oval eye. Designated as long length, the sizes range from 14 to 18. It can carry multiple strands of thread for weaving on loosely woven woolen and open weave knit fabrics.

7. **Sharps**
   A needle with a small rounded eye and of medium length is called the sharp. Sizes range from 1 to 12. These are general purpose needles with sharp point for sewing and appliqué

8. **Tapestry**
   Large-eyed needle with a blunt point for cross stitch, needle point and for stitching knitted items.

2.Machine sewing needles

Sewing machine needles are made up of steel. They are manufactured in different sizes and types for both industrial and home sewing machines. Size range from fine to coarse and are chosen with regard to interaction of yarn of the fabric and size of thread. Higher numbers indicate thicker points and coarser needles. Needles are standardized and classified with regard to the type and model number of machine on which they are used.

There are many different kinds of needles among which majority of sewing needles are listed below

1. **Ball-point needles** are used for sewing knits and meshes. The rounded tip

of this needle passes between the fibers of the fabric.

2. **Sharp-point needles** are used for sewing fine woven fabrics. The pointed, sharp tip pierces the fibers of the fabric.
3. **Universal point needles** can be used for sewing both knits and woven's. It is an excellent needle for general sewing use.
4. **Denim needles** are used for sewing heavy, dense fabrics such as denim.
5. **Leather needles** have a wedge-shaped tip for punching through leather, even for heavy vinyl and similar fabrics. Care should be taken while sewing with these needles as they leave large holes on removal of stitches.

Sewing threads

Sewing thread is an integral component of the garment though it is often invisible. Typically, the cost of thread is less than 5% of the retail selling price of the garment but 50% of the responsibility of the garment's performance is dependent on sewing thread.

A wide variety of threads from cotton, polyester, polycot to rayon are available for varied uses. It is customary to use cotton thread or cotton materials and polyester or polycot thread for synthetics. Rayon threads are used for embroidery work.

SEWING AIDS

DRESSMAKER'S PINS:

Comes in different sizes for use in different fabrics for holding of fabrics together temporarily before machining. These are long slender pins with highly polished finish and a fine tip for easy

THIMBLE:

A sewing thimble protects the middle finger of the right hand while hand sewing. Helps to push needles through the material being sewn and to prevent fingers getting pierced by the needle

SEAM RIPPER
A seam ripper is used to remove and pick out unwanted stitches/threads. The fine tip of a seam ripper picks out single thread and cuts it.

NEEDLE THREADER:

It can be used for both hand and machine needles to push the wire through needle eye.

FINISHING/ PRESSING TOOLS

Once the garment is constructed, it is subjected to neatening through trimming and pressing. Pressing is important at every stage of stitching, because poor pressing can destroy the appearance of a well constructed garment. In addition to the sewing tools and sewing machine, good pressing equipment is also essential.

1. **Iron**
2. **Iron board**
3. **Sleeve board**

IRON

There are different types of irons available in the market like flat iron, thermostatic, automatic, non automatic, charcoal, steam iron etc. Among all, the thermostatically controlled or automatic electric irons are the best, in which the temperature can be adjusted to various types of materials. These are most convenient for general purpose and home ironing.

Irrespective of types available in the market one should remember to keep base of the iron very clean and follow the guidelines given by the manufacturer while using.

IRON BOARD

Ironing boards can be free standing or mounted depending on the available space and frequency of use. Good padding should be provided to cover the base and it should be made from a natural fiber fabric like cotton or wool for best pressing. Foam pads are available for most ironing boards but they do not allow moisture absorption. A thick soft padding on the ironing board gives better results.

SLEEVE BOARD

A sleeve board allows pressing of narrow garments sections such as sleeves and trouser leg. The ideal sleeve board must be strong, stable and have sufficient space between the board and the base so that fabric does not crease in working. It is ideal for pressing necklines, shoulder seams and small hard to reach areas like pockets, belts, loops as they can be spread on this board without stretching or wrinkling the rest of the garment.

GENERAL TOOLS

PIN CUSHION: Pin cushions are useful to store needles before and after they are removed from the fabric. They can be made at home by using soft fabric and filling it with hair instead of cotton wool. Some pin cushions have an emery pack for cleaning and sharpening pins and needles, and some cushions can fit on the wrist for handy use. Pin cushions are available in a variety of styles like a tomato pin cushion, a wristband pin cushion and magnetic type.

AWL: It is a small, sharp-pointed tool used to punch small, round holes for marking in paper or leathers

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

BODKIN: It is used for drawing elastic, cord or ribbon through a fabric casing. They are basically large needles with large eyes meant for easy threading.

ORANGE- STICK: This is a long tool whose point can be inserted into the corners of collars, seams, etc., so as to give a neat pointed appearance.

STILETTO: This is a pointed metal with a wooden handle and is used to make eyelet holes or openings.

DRESS FORM: It is a padded form of body and may be made of wood, cardboard, plaster, reinforced plastic. It is an essential necessity in all sample rooms for designing and fitting.