

Sewing technology

unit 1

Introduction:

Sewing machine plays an important role in garments manufacturing industry. There are a lot of sewing machines used in ready-made garments sector. This article has shown all the parts of a sewing machine and function of those.

Parts and function of single needle machine

Different Parts of Sewing Machine:

1. Spool pin,
2. Bobbin binder spindle,
3. Bobbin winder stopper,
4. Stitch width dial,
5. Pattern selector dial,
6. Hand wheel,
7. Stitch length dial,
8. Reverse stitch lever,
9. Power stitch,
10. Bobbin winder thread guide,
11. Thread tension dial,
12. Thread take-up lever,
13. Needle clamp screw,
14. Presser foot,
15. Bobbin cover,
16. Bobbin cover release button,
17. Feed dog,
18. Needle,
19. Needle plate.

Functions of Sewing Machine Parts:

1. **Spool pin:** The main function of spool pin is to hold the spool of thread.
2. **Bobbin binder spindle:** During winding, bobbin is placed here.
3. **Bobbin winder stopper:** When bobbin reaches its optimum capacity then bobbin winder stopper stops the bobbin winding.
4. **Stitch width dial:** The main object of stitch width dial is to control the zigzag stitch.

5. **Pattern selector dial:** Pattern selector dial is to set the symbol of the desired stitch pattern.
6. **Hand wheel:** Hand wheel is used to raise and lower the need, which is situated in the right side of the [sewing machine](#).
7. **Stitch length dial:** Stitch length dial is used to control the length of the stitch.
8. **Reverse stitch lever:** The machine will sew in the reverse while the lever is pushed.
9. **Power switch:** Power switch means the off-on office of the sewing machine. Normally power switch is located at the right side of the machine.
10. **Bobbin winder thread guide:** These types of thread guide are used during bobbin winding.
11. **Thread tension dial:** Thread tension dial is used to control the tension on the top thread.
12. **Thread take-up lever:** During sewing the top thread passes through the thread take-up lever. Thread take-up lever moves up and down with the needle.
13. **Needle clamp screw:** Needle clamp screw holds the needle in its actual place.
14. **Presser foot:** Presser foot holds the [fabric](#) in its definite place.
15. **Bobbin cover:** During sewing bobbin cover protects and covers the bobbin holder.
16. **Bobbin cover release button:** This type of button is used to release the cover for entrance to the bobbin.
17. **Feed dog:** During sewing, feed dog pulls the fabric in forward.
18. **Needle:** Needle is used to form a stitch in the garments.
19. **Needle plate:** Needle plate is a metal plate which is situated under the needle and presser foot. It helps to move the fabric forward during sewing.

Double needle machine

Double needles can be used for creating pintucks, parallel rows of topstitching, a simulation of a coverstitch hem (found on T-Shirt hems) and decorative stitches. It can also be used with free motion quilting. The distinct look of a zig- zag on the back is formed as the single bobbin thread links with both top threads.

Threading the sewing machine with two threads is just like threading the machine with one thread. Some sewing machines machines have two thread tension disks to

separate the two threads for proper tension. Tension settings should remain normal if using regular sewing thread. Check the manual for double needle or twin needle threading directions.

Decorative stitches can take on a whole new look when using a double needle. Try different color combinations and variegated threads for unique looks. But wait! When doing any stitch other than a straight stitch, you must, you must, you must adjust the stitch width! Look to see what the maximum stitch width is of the machine and write the number down. (5.0mm? 7.0mm? 9.0mm?) Check the double needle package and write down the size (2.0mm? 4.0mm?). To set the machine so not to break the double needle subtract these two numbers: the maximum sewing machine width “ double needle size = the stitch width for using the double needle. Double check the stitch width EACH TIME a new decorative stitch is selected. Sometimes I even hand turn the machine through the first couple stitches to be absolutely sure the needle will not swing to wide and hit the edge of the foot.

Overlock machine

n overlock is a kind of [stitch](#) that [sews](#) over the edge of one or two pieces of [cloth](#) for edging, [hemming](#), or [seaming](#). Usually an [overlocksewing machine](#) will cut the edges of the cloth as they are fed through (such machines being called [sergers](#) in North America), though some are made without cutters. The inclusion of automated cutters allows overlock machines to create finished seams easily and quickly. An overlock sewing machine differs from a [lockstitch](#) sewing machine in that it uses loopers fed by multiple thread cones rather than a bobbin. Loopers serve to create thread loops that pass from the [needle](#) thread to the edges of the fabric so that the edges of the fabric are contained within the seam.

Overlock sewing machines usually run at high speeds, from 1000 to over 9000 rpm, and most are used in industry for edging, hemming and seaming a variety of fabrics and products. Overlock stitches are extremely versatile, as they can be used for decoration, reinforcement, or construction.

Overlocking is also referred to as "overedging", "merrowing", or "serging". Though "serging" technically refers to overlocking with cutters, in practice the four terms are used interchangeably.

Bar tacking machine

Different Parts of Bar Tack Sewing Machine:

1. [Bobbin winding](#)
2. Bobbin winding spring tensioner
3. Back stitch lever
4. Spring tensioner post box
5. Thread guide
6. Knife lever
7. Thread take-up lever
8. [Needle](#)
9. Knife
10. Wiper
11. Pressure feed guide
12. Throat plate
13. Bobbin
14. Bobbin case
15. Pressure lever
16. Tensioner

Working Principle of Bar Tack Sewing Machine:

At first this machine produces tack stitches in a small length (1-2 cm) and then sews covering stitches over and at right angles to the first stitches. The variables are the number of tacking stitches and the number of covering stitches. Typical uses are closing the ends of buttonholes, reinforcing the ends of pocket openings and the bottoms of flaps and sewing on belt loops. The adjustment points of this machine are needle, pressure feed, stitch length, stitch density.

Uses of Bar Tack Sewing Machine:

1. Attaching belt loops.
2. Increasing strength in corner of pocket.
3. Closing the two corners of button hole.
4. At the end of zipper.
5. In that place where more strength is needed to support extra load.

Description:

This machine works in cyclic system i.e. during pressing switch after sewing one complete button hole the machine will stop. In fully automatic button hole m/c more than one i.e. pre-selected no. of button holes can be sewn in pre-selected distance. In this system no mark is needed on cloth for button hole. In button hole m/c there is system to make big or small button hole and also to increase or decrease the stitch density. Usually lock stitch or chain stitch is used here. Button hole can be made before or after sewing. Both system has some advantage and disadvantage. If hole is made before then the cut edge is closed in sewing and the button hole is seen very good and clean. But the disadvantage is that after starting sewing there is no chance to change the button hole place & cut edge disturbs to sew well due to flagging. But disadvantage is thread of cloth is come out along the sewing line of button hole that looks very bad. Usually for dense woven & coarse cloth before sewing, for thin cloth after sewing button hole is made.

Use:

To make button hole in different apparels.

This type of machine can not be used for normal purpose. But for making a complete garment their importance can not be denied. Special care and sufficient knowledge is necessary for proper working. Otherwise faulty sewing may be done. I would like to give special thanks to our teacher. I am also grateful to our instructors. I think this will be very helpful in my future life.

Juki Button Attaching Machine

Juki, Janome, Elna, pfaff & Bernina developing button stitching sewing machine. Button stitching machine is a special type of machine which is used in garments industries to attach button so it is called button attaching machine. This type of machine works for stitching shirt buttons in a cycle and so these are also called simple auto machine. Button attaching machine is closely related with **Button Hole Machine**

Function of Juki Button Stitching Machine:

This machine is applied to the industries of clothing in attaching buttons. Specially used for attaching the polo shirt and woven shirt buttons. Sewing equipment is available in store house of Juki, Janome, Elna, pfaff & Bernina

Parts of Button Stitching Machine:

The general parts of this type of machine is listed below –

- Pulley
- Button clamp
- Operation panel
- SD card slot
- Control box
- Work clamp
- Power switch
- Eye guard
- Side cover
- Cone stand
- Thread take up cover
- Finger guard

Features of Shirt Buttons Stitching Machine:

The features of shirt buttons machine is specified here shortly –

- It is a simple automatic m/c.
- Button positioning can be automatic.
- Sewing is according to the hole in button & may be cross or parallel.
- Automatic feeding of the shirt buttons
- Stitch type: lock stitch or chain stitch may used.

What is Blind Stitch?

Blind stitch sewing machine for blind stitching is a special type of sewing machine which is used in the garments industries to produce stitches is not seen on the face side of the fabric is called blindstitch sewing machine. Usually curved needle is used in this machine as it can penetrate in the fabric partially..

How to Blind Stitch Machine Works?

This machine is used for blind stitch hem and attaching the lining to the waistband. Blind sewing machine stitches represent high quality and perform equally well on light to heavy fabrics. The various problems to be checked are listed in the list of

the defects in . Apart from this audit system after every critical operation checkpoints are established, within a line of production, where 100% checking is done.

Blind Stitching Sewing Machine with Parts:

Blind stitch sewing machine with parts is listed here –

- Pulley
- Cone stand
- Side cover
- Skip stitch device
- **presser foot**
- **Thread guides**
- Thread take-up lever
- Thread tensioner

Features of Blind Stitch Machine :

The features of Blind Stitch Machine is described here shortly for better understanding about the machine-

Off-stitch prevention: Off-stitch can be prevented because this is stepped part detection type. When the stepped part at joint seam passes the blind-hemming guide, the sensor detects the stepped part and the slide edge guide moves to the right to prevent off-stitch.

Guide fix: table seam can be obtained and very beautiful sewing will result because the blind-hemming guide is fixed securely with the solenoid during sewing. Also when the stepped part of joint seam passes the blind-hemming guide and the sensor, the guide is fixed and the sensor detects the stepped part correctly.

Easy guide operation: The blind-hemming guide is raised by pressing the knee switch lightly and manual raising is unnecessary, and the beautiful sewing finish. When placing a fabric, the blind-hemming guide is free (no load), and placing of a fabric is easy.

Easy interchanging to plain sewing (with TC device only): When CH device swings out frontward and the lever of TC device moves to plain sewing direction, the tension changes from blind hemming to plain sewing and easy plain sewing is possible.

Fabric Examining Machine

Fabric examining machine with variable speed control, overhead lighting and yardage counter. The machine must be clean with no excess oil and no sharp edges to damage the fabric. The garment making process should inspect 10% of rolls from each delivery AT RANDOM – this should include all colours and dye lots within a delivery. If the results show a high fault rate, an additional 15% of the rolls should be inspected. A high fault rate is defined as an average fault rate in excess of 29 points per 100 square yards.

Fabric examining machine procedure:

Auto as a standard for design, colour and handle. The process needs to check against this cutting as follows:

Design, Colour, Handle, Shading

At the beginning of each roll, a 6” full width cutting should be taken as a design & colour reference and checked against the approved bulk cutting for the following:

- design
- colour
- handle
- side to centre and side to side shading

This full width cutting must be labelled with the order number, fabric reference number or name, batch number, piece number, colour name, colour number, date and whether it was acceptable to the approved bulk cutting or not.

Width

The width of the fabric between the stenter pins must be measured and compared with the given minimum usable width.

Shading & Width

Each roll checked, should be stopped at least 3 times during inspection. At these stops design, colour, handle and side to centre and side to side shading should be assessed. End to End shading must be checked by comparing the full width cutting to this point in the roll. Also the cuttable width (between stenter pins) should be measured.

The cuttable width should be recorded on the inspection report, as should any design, colour or handle variability detected.

Length

The garment making process should check the fabric length stated on the piece ticket against the actual length of roll for variance. Both values should be recorded on the inspection report.

Defects

During the inspection, the fabric needs to be checked for defects which are rated on the 4 point system, as follows:

- Flaws up to 3” in length = 1 point
- Flaws up to 6” in length = 2 points
- Flaws up to 9” in length = 3 points
- Flaws over 9” in length = 4 points

Fiber laser cutting machine components and functions

Fiber laser cutting machine has widely applied in various industries. More and more people begin to pay attention to fiber laser cutting machine. And XT LASER explains the fiber laser cutting machine components and functions for you.

Fiber laser cutting machine is the main equipment of machine, light and electricity. And the integration of the whole system mainly compose of: a part of the host machine, laser, laser head, CNC system, operating platform, laser power supply, chiller, cylinder, air compressor, gas tank, cooling dryer, filter, exhaust dedusting machine, deslagging machine etc..

1. Machine body

Laser cutting machine body, the realization of the X, Y, Z axis movement mechanical parts, including cutting platform. It uses to move the cut workpiece and can move accurately and accurately according to the control program. It usually drive a servo motor.

2. Laser source

A device to produce a laser light source.

3. Laser cutting head

Cutting head drive device program to drive the cutting head to move along the Z axis, consisting of servo motor and screw or gear transmission parts.

4. CNC system

Control machine tools to achieve X, Y, Z axis movement, but also control the output power of the laser.

5. Operating table

Using to control the working process of the whole cutting device.

6. Voltage stabilized power supply

Connected to the laser, the CNC machine tool and the power supply system. It is mainly to prevent the interference from external power grid.

7. Cold water unit

Used to cool the laser generator. A laser is a device that uses electrical energy to convert into light energy. For example, the conversion rate of a CO₂ gas laser is generally 20%, and the remaining energy convert into heat. The cooling water takes the excess heat away to keep the laser generator working properly. Chiller of machine optical reflector and a focusing mirror for cooling, to ensure the stability of the beam quality, and effectively prevent the lens cause high temperature deformation or crack.

8. Gas cylinder

Including the laser cutting machine working medium cylinder and auxiliary cylinder, use to supplement the laser shock industrial gas and supply cutting head with auxiliary gas.

9. Air compressor, gas storage tank

Supply and storage of compressed air.

10. Air cooling dryer and filter

It is used to supply clean dry air to laser generator and beam path. So as to maintain normal operation of passages and mirrors.

11. The exhaust dust collector

The dust and dust produced when the processing is processed, and the filter is carried out to make the exhaust emission conform to the environmental protection standard.

12. Slagging machine

Excluding the edge and waste material and waste produced when processing.

Attachments to sewing machines:

Generally sewing attachment means **sewing machine parts** and accessories. Sewing machine attachments make sewing machines easier and provide a variety of decorative sewing possibilities. These sewing machine attachments are mechanisms that are attached to sewing machines without cutting through or changing the original frame of the machine. The removal of such an attachment leaves the machine in its original condition.

These attachments are fastened to the machines by screws or nuts and bolts. These are static, dynamic or synchronised; static attachments do not move during the sewing work cycle; dynamic attachments are moved by the operator during the sewing work-cycle. Synchronised attachments have a link (or links) connected directly or indirectly to one of the driveshafts of the **sewing machine**. The moving link has a motion **pattern** that positions the fabric during the sewing element of the operation work-cycle. This positioning pattern must be synchronised with the stitching or feeding action of the machine.

The majority of the attachments are normally secured to the presser bar instead of the foot. A few sewing attachments have hooked ends that rest on the needle clamp. The following lists the classes and types of sewing machine attachments:

1. Position attachments
2. Guide attachments
3. Preparation and finishing attachments

1. Position Attachments:

Hemmers:

Hemmers (Figure-1) construct hems from 3/16" to 7/8" wide, right on the sewing machine. Machine hemming with the hemmer attachments could save plenty of time compared to hand turning and basting. The hemming portion is automatically turned by the hemmer, and simultaneously the line of stitching is guided close to the edge of the hem. Hems are normally done at various widths, which can be made with the hemmers, suitable for the common requirements.

Classification and Functions of Sewing Machine Attachments:

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Ruffler:

The ruffler attachment has the capacity of doing gathering or pleated frills as shown in Figure-2. It is normally utilised for making children's clothes and curtains. The means of utilising the ruffler attachment varies with different sewing machines.

Binder:

It is a valuable attachment in a sewing machine. Though fine bindings can be created by hand, the binding using the attachment on the machine saves a lot of time and is precise and accurate as shown in Figure-3. It is commonly utilised for

applying readymade bias binding to a straight or curved edge and is a useful attachment for trimming dresses, etc. The binder attachment has a small funnel-like portion for folding and guiding the binding over the edge of the fabric before it reaches the **sewing needle**. This attachment could be used for sewing straight, zigzag as well as decorative stitches.

Tucker:

This attachment is used for creating uniform tucks from 1/8" to 1" width. Finest pin tucks having 3/4" width could be created easily without any basting. Delicate twin-needle pin tucks are a breeze with the grooves on the base of the presser foot as shown in Figure-6. The pin tucking foot is used in conjunction with a 2-mm twin **sewing needle** to make multiple rows of pin tucks. The grooves on the base of the pin tuck foot make it easy to stitch multiple rows parallel and uniformly spaced from each other.

Gathering foot:

The gathering foot attachment (Figure-7) is used for making soft gathers swiftly particularly in lightweight fabrics. The gather size in the garment depends upon the fabric **GSM**, tension of the needle thread and stitches per inch. The base of the gathering foot is raised up at the back of the sewing needle and has a thicker bar section in front of the sewing needle for gathering and ruffling of fabric simultaneously.

2. Guide Attachments

Zipper foot:

The zipper foot could be set to stitch on both sides of the zipper (Figure-8). The edge of the foot directs the zipper to make sure placement is straight. Normally ready-to-wear garments will commonly have an invisible zipper fitted onto them. Invisible (concealed) zippers are appropriate for all garments made from fine silk jersey through to suit weight wools and tweeds, which can be secured on the garments using a concealed zipper foot (Figure-9). The grooves underneath the concealed zipper foot contain the zipper teeth and hold them in place during stitching. The main criterion is to get the needle as close to the zipper as possible, which this foot achieves by slightly unrolling the zipper just before the needle. An adjustable zipper foot (Figure-10) can also be set to sew on each side of the zipper by regulating the location of the foot and tightening the screw.

Cording foot:

The 3-way cording foot (Figure-11) will grip three fine cords or threads. Since it is attached to the presser foot, the requisite design can be easily followed and the cords are perfectly placed. A range of functional or decorative stitches could be sewn over the cords to put them onto base fabrics.

Circular attachment:

The circular attachment (Figure-12) is the most suitable one for sewing of circles using straight, zigzag or decorative stitches. Circles up to 26 cm in diameter can be stitched perfectly using this attachment, which is vital for craft and decorative work.

Button sewing foot:

The two bars in the button sewing foot (Figure-13) are fixed to the shank of the presser foot to give additional firmness and it has a rubber sleeve for better gripping of the button during sewing.

Buttonhole stabiliser plate:

With the buttonhole foot (Figure-14), which is secured to the buttonhole stabiliser plate, the machine feeds a range of fabrics and uneven layers smoothly instead of causing the needle to stick in position.

Buttonhole foot:

The buttonhole foot (Figure-15) is used for sewing buttonholes on the fabric. Two kinds of buttonhole foot are available, namely, transparent buttonhole foot and sliding buttonhole foot. The transparent buttonhole foot is used for stitching buttonholes on tight zones like cuffs and a sliding-type foot is used for stitching buttonholes on areas where more freedom of movement is essential.

3. Preparation and Finishing Attachments:

- **Pinking:** It is a common finishing operation on garments. A power pinner is normally used for this purpose or pinking mechanism could be attached to the sewing machine. The two major actions carried out by the pinkers are chopping and cutting.
- **Pressing attachments:** It is used for finishing garments after the fabric is sewed. For example, on a belt loop attachment process where a flat iron or rotary press pressing device is attached to the machine head.
- **Thread cutters:** These are extensively required alternatives that minimise production time and get rid of manual thread clipping. On a few machines, sewing threads are cut beneath the throat plate, and a wiper pulls the residue portion of cut thread out of the way in preparation for the next process. Most of the 400, 500 and 600 class stitch machines have chain cutters and latch back devices built-in since the chain stitch formed by these kinds of machines should not be broken by a hand-tearing action.
- **Chain cutters:** The chain cutters cut the chains in such a way that the stitch is secured against unravelling. Stitches produced on these machines cannot be cut as close as like in lock stitch machines, and some remnant thread remains.
- **Tape cutters:** It could be used with the application of shoulder reinforcements, neck bindings, elastic, lace and so on. As stitching is finished,

a photocell sensor finds the fabric end or piece and connects the cutter automatically. Tape may be cut at the beginning and end of the garment piece.

- **Needle and stitch devices:** On several sewing machines, options are designed especially for assisting in the construction of the perfect line of stitches such as needle positioners and stitch pattern regulators.

Sewing Machine maintenance

A good rule to follow is to set up a cleaning and oiling session after 100 hours of use. So if you sew 3 hrs a day, after 30+ days ie once almost every 1 month – That is not too hard.

Step 1 – Maintenance

There are some precautionary measures you should be taking on a day to day basis if you want a long life for the machine. Ensure that these practices are followed on a regular basis

1. Always (always) cover the machine when not in use – make a pretty sewing machine cover yourself or use the bland one you got when you bought the machine or use an old scarf to cover it. Whatever you do, make sure that the machine is covered from all the dust in the air which is going to choke the life out of it in time. Keeping the machine out of sunlight is also a good idea.
2. Ensure that you are using the appropriate thread and needle for the fabric. Checkout the [post on selecting the appropriate sewing machine needle for your project](#).
3. Do not make your machine sew fabrics which it shouldn't be – like that extra thick upholstery fabric with pleats – your home sewing machine may not be up to sewing through such thick layers. It may prove to be too much for the internal parts.
4. Ensure that the power source is good enough for the machine . Always take out the power plug from the outlet when not in use.

5 Read up the sewing machine manual cover to cover. Keep it somewhere safe preferably near your sewing machine. Checkout this post on where to [download manuals](#) if you do not have one handy.

6. Before sewing check the bobbin case always every time – the lint which inevitably lands up there can disrupt sewing in a really bad way and also build up fast.

7. Always thread the machine with the pressure foot lever in an up position.

Step 2 –Cleaning your sewing machine

Dust and lint are the most troublesome problems your sewing machine will have to endure in its whole life. The dust particles and lint from the fabric you sew which sneak inside will fill and clog the insides of your sewing machine. They will make the machine over work.

Oiling the sewing machine

Check your manual for this and do whatever is appropriate for your machine. If your manual says no oiling oil at your own risk. For my machine the manual donot mention oiling at all and manufacturer says donot oil but I do oil and I think my machine works better with it.

Common Sewing Problem with Causes and Remedies:

Various types of [sewing](#) problem which are arise during sewing the garments are-

1. Skipped stitches,
2. Unbalance [stitch](#),
3. Staggered stitch,
4. Variable stitch density,
5. [Seam puckering](#),
6. Bobbin or looper thread breakage,
7. Needle thread breakage,
8. Thread fusing when [sewing machine](#) stops.

1. Skipped stitches:

SL No.	Causes	Remedies
01	Failure of hook or looper and needle to enter loop at correct time.	Examine the setting and timing between needle and hook or looper.
02	Irregular thread tension on upper or lower loop.	The tension of thread should be adjusted.
03	Due to needle deflection.	Needle should be changed.
04	If needle thread loop size is too small.	Needle size and thread should be adjusted.
05	When flagging of fabrics is happened during sewing .	The pressure of pressure foot should be adjusted perfectly.
06	If sewing thread is unable to form loop.	Thread should be changed.

SL No.	Causes	Remedies
01	Incorrect tension of sewing thread.	Setting of accurate tension to the thread.
02	Used incorrect thread path.	Using of accurate thread path.
03	Incorrect adjustment of needle thread path.	Using of right thread path.
04	Snagging of needle with bobbin case and positioning finger.	Bobbin case to be smooth and finger positioning to be set again.
05	If sewing threads are not lubricated.	Better quality threads must be used here.

2. Unbalance stitch:

SL No.	Causes	Remedies
01	Due to needle deflection.	Needle size should be increased.
02	Due to wrong needle point.	Needle should be changed.
03	Incorrect adjustment of needle and thread size.	Needle size and thread size should be changed.
04	Due to defected motion of feed dog.	Feed dog motion should be adjusted.
05	If fabrics not controlled properly in the feed mechanism.	Accurate pressure of pressure foot should be adjusted.

3. Staggered stitch:

4. Variable stitch density:

SL No.	Causes	Remedies
01	Incorrect unwinding of thread form package during sewing.	The position of thread guide should be 2.5 times higher than the position of thread package.
02	Twisting of needle thread in the bottom of thread package.	Foam pad should use to the bottom of thread package.
03	Twisting of thread in thread guide.	Correct threading of sewing thread during sewing.
04	Excessive tension of thread.	Tension of thread should be less or use of higher strength threads.
05	Using of broken check spring.	Check spring should be changed.
06	Fraying of thread in the needle.	Finer threads should be used or to be used heavy needle.
07	Becoming more heated of sewing thread.	Needle lubricant and needle cooler should be used.
08	Becoming more heated of hook.	Lubricant should be available and test the distance between needle and hook.

SL No.	Causes	Remedies
01	Incorrect winding of threads on to the bobbin.	Proper winding of threads on to the bobbin.
02	Excessive tension to the bobbin threads .	The tension should be adjusted to the bobbin threads.
03	If the edges bobbin case, looper eye and so on are more sharpened.	The edges should be smooth.
04	Incorrect fitting of bobbin case.	Test the size and types of bobbin.
09	Using of low quality sewing thread.	Sewing thread should be changed.

5. Seam puckering:

SL No.	Causes	Remedies
01	Higher thread tension.	Bobbin tension should be kept as low as possible.
02	Improper thread balance.	Proper thread balance should be ensured between top and bottom thread.
03	Incorrect thread types .	Have to maintain tension guides properly.

6. Bobbin or looper thread breakage:

SL No.	Causes	Remedies
01	Incorrect winding of threads on to the bobbin.	Proper winding of threads on to the bobbin.
02	Excessive tension to the bobbin threads.	The tension should be adjusted to the bobbin threads.
03	If the edges bobbin case, looper eye and so on are more sharpened.	The edges should be smooth.
04	Incorrect fitting of bobbin case.	Test the size and types of bobbin.

7. Needle thread breakage:

SL No.	Causes	Remedies
01	Faulty sewing thread.	Should be used better quality thread.
02	Densely woven fabric which is poorly finished.	Should be improved fabric finishing.
03	Damaged needle after sewing thread breakage.	Should be changed the needle.

8. Thread fusing when sewing machine stops:

Unit 2

Stitching mechanism

Stitch Forming Mechanisms:

Stitch formation is a basic and the most important task for sewing machine. The first step in producing a stitch on a sewing machine is the formation of the needle thread loop. Proper formation of this loop depends on the tendency of the thread to bulge away from the needle as it is drawn upward after reaching the lowest point of its stroke – due to inertia and friction against the material through which it passes. The stitch-forming mechanisms are the mechanical components; with perfect synchronisation between the parts they form stitches. The stitch forming mechanism includes a needle, a thread carrying looper and a retainer which enters the looper thread loop and operates to retain and hold the same during the retracting movement of the looper until the needle has entered the looper thread loop.

There are different types of needles are developed day to day. In the early history of the human instinct of self-defense based, and made clothes. Production technology was also very simple, is to use an awl made of animal bones do. Stitched weapon, these bones may only be used to pre-piercing cone to Lipi Sheng or Through the vines. The use of animal bones, horn, ivory manufacturing. Made by bone, horn, ivory. 17500 BC in the first hole of the needle has come out root. Manufacturing 3500 BC copper is used in the needle. 1000 BC iron began to be

applied to enhance hardness than in the past many. You can visit more about some [types of needles replacement](#) system

Types of Needles:

- Knitting types of needles (circular knitting machine needles, sewing machine needles cross)
- Medical types of needles (surgery, minimally invasive surgical needles, acupuncture, medical america)
- Instrument with a needle (flute, saxophone with a needle)
- Electronic semiconductor with a needle (air filters, discharge needle, probe)
- Nonwoven (needles)
- Finishing with a needle
- Hand stitches
- Needle arts (ceramics, quilting)
- Bur
- Computerized embroidery needles
- Schiffli lace with a embroidery needles
- Costume with a needle (underwear, jeans, knitted ...)
- Leather (footwear) with a needle
- Bindings with a needle

Bobbin and bobbin case

A sewing machine which may employ a loop-making hook rotating about a vertical axis employs a one-way bobbin and bobbin case. A bobbin can have a larger flange and a smaller flange so as to fit in a suitably configured bobbin case in only one way. The bobbin may have a blind axial opening with a guide groove to fit a winder spindle in only one way so that the bobbin can only be wound in one way. Attempts at incorrect orientations cause the bobbin to protrude from the bobbin case in an obviously incorrect manner. Inadvertent efforts to wind the bobbin incorrectly are likely to be fruitless. Thus, a user can readily install the bobbin in the bobbin case with a proper orientation and with the thread correctly wound. Surprisingly, stitching problems, such as poor seams or the like, can be reduced.

Bobbin winding

Most home sewing machines come with a built in bobbin winder feature, however, some home sewing enthusiasts prefer to have a separate bobbin winding machine.

The portable bobbin winder enables the sewer to wind extra bobbins without having to stop and un-thread their sewing machines first before utilizing the machine's bobbin winding feature (see the manufacturer's instructions that coincide with your machine). Portable bobbin winders are inexpensive and saves time when working on a project.

Shuttle hooks

Rotary hooks and shuttles are very important parts of any sewing machine's operation. They work by picking up the thread loop formed by the needle on its upward swing. ... These parts reduce the potential for the needle to hit the hook if it bends entering the fabric or is pulled out of position when feeding heavy fabrics.

Loop spreader

Loop spreader:

Loop spreader aids the looper in creating the stitches. The blind loopers normally have two dull points, the point that grips the needle thread from the needle is the looper point and the other point that spreads the needle thread loop is a loop spreader.

Thread finger:

Thread finger is a metal link with an eye which may be static or dynamic. The static links direct the covering thread, whereas the dynamic links carry thread back and forth across the needle path. They are utilised for producing class 600 stitches and are generally synchronised with the needle

Upper and lower threading

Sewing machines need an upper and a lower thread to form the stitches. The lower thread is kept in a small bobbin stored underneath the presser foot. The mechanism for winding the bobbin may vary based on the model of your sewing machine. ... Then pull the thread out and around the bobbin winding guide.

Auxiliary hooks

Disclosed is a straight hook auxiliary line-hooking mechanism, which comprises a line-hooking sleeve; the line-hooking sleeve is fixed on a positioning bushing and is positioned on a C-shaped shaft body after passing through two deep groove ball bearings; a line-pressing pipe is additionally arranged in the positioning bushing, and is fixed on the C-shaped shaft body together; two straight hooks are arranged at the front end of the line-hooking sleeve; a corner gear wheel is arranged at the tail end of the positioning bushing; a transmission seat is positioned on a bracket soleplate, and then is fixed on the C-shaped shaft body; the cylinder is connected on the transmission seat, and is fixed on the C-shaped shaft body through the cylinder fixing plate; a corner gear group is fixed on the transmission seat and is meshed with the corner gear wheel, so that the line-hooking sleeve can be driven to be rotated through the flexible motion of the cylinder; the pressing line pipe is connected on the cylinder through a floating coupling, so as to facilitate the line-pressing motion. The straight hook auxiliary line-hooking mechanism has the beneficial effects that: the complex line incoming action can be simplified on the line-hooking sleeve so as to match with the line-pressing pipe to avoid the hook-sliding of the enamelled wire, the production efficiency is improved, the structure is simple, and the rotor is widely applied.

Throat plate

A sewing machine throat plate is the metal plate beneath a [sewing machine's needle](#) and presser foot. It is typically held in place with one or more screws.

- A sewing machine throat plate has holes or slots for the needle to pass through as it moves up and down to stitch the fabric. It accommodates the different needle positions and fancy stitches available on the machine.
- A throat plate has a second, larger opening (or two) that allows the [sewing machine feed dogs](#) to emerge from below to grip the fabric and help move it forward as you sew. Remember that feed dogs can be lowered for some tasks, such as freehand quilting techniques and darning.
- It's easy to see the feed dogs stretching upward through rectangular openings in the plate.
- A throat plate also provides a smooth surface for the fabric as it passes through the machine.

Take-ups

his invention relates to needle-thread take-up mechanism for lock-stitch sewing machines having a reciprocatory needle and a cooperating rotary hook which makes two complete rotations for each needle reciprocation.

One of the objects of this invention is to provide an improved and simplified needle-thread take-up mechanism having a thread-engaging element which travels in a circular path at a variable speed and is capable of high speed operation.

Another object of this invention is to provide improved thread-guides which direct and maintain the needle-thread in the path of travel of the take-up element. A still further object of the invention is to provide a needle thread take-up mechanism which may be assembled separate from the machine and then applied to the machine as a unit

The tension discs and tension regulator together are called the tension assembly. The tension discs squeeze the thread as it passes between them, while the tension regulator controls the amount of pressure on the discs. On older machines, there are only two tension discs, controlled by a screw or knob. On newer models there are three discs controlled by a dial or key pad on the front of the machine, which can regulate two threads at once.

In either case, the tension regulator is elementary: When adjusted to a higher number (turned clockwise), the discs move closer together, increasing the amount of pressure. Turned to a lower number (counterclockwise), the discs move apart, decreasing the pressure. Using a thicker thread without resetting the dial will increase the pressure and cause the upper thread flow to decrease, unless you've got a newer machine that makes automatic upper-tension adjustments. Since the bobbin tension is not self-adjusting, the lower tension may need to be adjusted manually to match.

Tension guide

1. If you've determined that more tension (strength) is required for the needle thread, turn the tension knob (or digital setting) up just a bit (refer to your manual).
2. If the bobbin needs a little more pull, lower the needle thread's tension setting.

Feed mechanism is defined as the process by which the fabric is moved forward in the feeding zone of the sewing machine. Basically, it refers to how the [needles](#), bobbins, loopers, auxiliary feed mechanism parts, and the fabric being sewn itself

moves. The feed mechanism is important because advancing the fabric is the only way for the needle to be able to engage the next portion of the material being stitched.

3. Some industrial sewing machines only have a single type of feed mechanism, while others have multiple feed capabilities. Needless to say, machines that can stitch using several types of feed mechanisms often cost more.
4. The most common types of sewing machine feed mechanisms are as follows:
5. Drop feed mechanism – The drop feed mechanism is commonly found in domestic sewing machines and a majority of industrial sewing machines. Also known as regular feed mechanism, the drop feed mechanism involves the movement of serrated metal strips known as feed dogs, which are found in slots in a sewing machine's
6. needle plate. As the needle is retracted from the fabric, the feed dogs underneath drag the fabric or material horizontally in order to move the workpiece.
7. Differential feed mechanism – Sewing machines that use a differential feed mechanism have two independent sets of feed dogs. These feeds dogs can be manipulated so that the material or fabric around the needle can be stretched or compressed as needed.
8. Needle feed mechanism – Many industrial sewing machines, especially those that use double needles, use the needle feed mechanism. They rely on the needle itself to act as the primary feeding element that moves or advances the fabric through the feeding zone.
9. Walking foot mechanism – Machines that use the [walking foot](#) mechanism swaps a regular immobile presser foot with a moving walking foot that actively works to move the material being sewn. It usually works in conjunction with other types of feed mechanisms.

10. The walking foot mechanism makes it easier to sew weighty fabrics and other heavy materials like leather, as well as cushioned workpieces like quilts or bedding materials. The walking foot mechanism is also useful when sewing multi-layered materials, which can be challenging to sew with a stationary presser foot because of the possibility of the layers accidentally shifting from their position as they are being stitched.
11. Puller feed mechanism – Sewing machines with a puller feed mechanism use supporting rollers that grip and pull the fabric or material being sewn. It is useful for sewing large and heavy workpieces like leather upholstery, tents, and car covers.
12. Feed dogs are the critical component of a "drop feed" **sewing machine**. A set of feed dogs typically resembles two or three short, thin metal bars, crosscut with diagonal teeth, which move back and forth in slots in a sewing machine's needle plate. Their purpose is to pull ("feed") the fabric through the machine, in discrete steps, in-between stitches.

Stitching machine mechanisms

Material feed is the controlled movement of the material being sewn from one stitch position to the next. Different feeding mechanisms available are for sewing fabrics. Some of them are Manual feed, Feed dog, Drop Feed, Needle Feed (Upper pivot needle Feed, Central pivot needle Feed, Parallel drive needle Feed), Wheel feed, Rotary feed, Upper Feed (Vibrating Presser Foot, Alternating Presser Foot, Top Feed, Jump Foot, Walking Foot, Spring action asking Foot, Driven walking Foot, Wheel feed).

What is a presser foot

A pressure foot is an attachment used with the sewing machine to hold the fabric flat as it is fed through the needle and stitched. The movement of the fabric in both front and back direction is made possible as the feed dog with its motion presses up against the pressure foot and the sewer provides extra support to the fabric by guiding it with one hand.

The pressure foot keeps the fabric flat so that it does not rise and fall with the needle and pucker as it is stitched. The pressure foot is often single hinged to provide flexibility as the workpiece moves beneath it.

Pressure foot is of numerous types often specialized to adjust with different types of working material, different types of stitches, seams, etc. The most commonly used pressure foot is the all-purpose foot and the zipper foot. Following are the different types of the specialized foot along with their functions.

Related: Different Types of Industrial Sewing Machines and Their Use

1. All-purpose foot

The all-purpose sewing foot as the name indicates can be used for any type of sewing. It is most often used in straight single needle machines. It is the most basic of sewing foot and does not include any work aids for easing of tasks.

2. Satin foot

It is used for decorative stitching as the stitches have to be dense. This is most commonly used in appliques.

3. Zipper foot

This is one of the most common foot and its narrow foot allows for close stitch around the zipper.

4. Sew-easy foot

Helps you sew in straight lines, no matter what seam allowance you need. The foot has a "ruler" with an adjustable guide for precision. The foot has a "ruler" with an adjustable guide for precision. For beautiful topstitching, place the guide along an already stitched seam or against an edge.

5. Adjustable zipper cording foot

It has a screw at the back making it possible to move the foot manually to the left or right. It is most often used for piping and cording as the foot can be adjusted

manually so that it can be sown very closely to the piping when creating or inserting it.

6. Blind hem foot

Blind hem foot makes it easier to sew a hem on garments. There are various styles of blind hem feet but what they have in common is an extension at the front of the foot for guiding the fabric fold.

7. Overedge foot

Overedge foot is used when adding a seam finish at the edge of a seam allowance. There is a small bridge in the foot which allows more thread into the stitch. Fabric is guided along with the extension at the front of the foot.

8. Button stitch foot

Button stitch foot is used to easily attach buttons whether they are 2 hole or 4 hole buttons. It holds the button securely in place while a zigzag stitch is used to attach the button. If the machine has a drop feed lever lower the feed dogs, if not use a feed dog cover plate over the feed dog or simply put the stitch length to zero.

9. Darning embroidery foot

This kind of presser foot is used for free motion work like stippling.

10. Even feed foot

The even feed foot is sometimes called the walking foot or dual feed foot. It works just like another set of feed dogs helping to feed the fabric to the stitching area. Use this foot to prevent shifting of coat layers or shifting of seams in fabric like velvet or corduroy. It is also used heavier material as only the feed dog is not enough to feed the material through the needle.

11. Quarter inch foot

The quarter inch foot is most commonly used for quilting but can also be used for craft sewing. Use the edge of the pressure foot as a guide for sewing ¼ inch seam.

12. Open toe foot

The open toe foot has a large open area in the front of the foot providing a large view of your work which is very helpful when decorative stitching or coaching over ribbons and trims.

13. Edge joining foot

The edge joining foot is used for joining trims or fabrics.

14. Pintuck foot

The pintuck foot has several evenly spaced grooves on the bottom which allows for sewing parallel rows of stitching closely together. It is used along with twin needle to create a wonderful surface texture on the fabrics very commonly found in many garments and home accessories.

15. Ruffler foot attachment

The ruffler foot attachment is used to create perfectly spaced pleats and gathers at set intervals. It can be used for light-weight as well as medium weight fabrics.

16. Gathering foot

The gathering foot is simply designed to create fullness in soft light well fabrics.

17. Cording foot

The cording foot has grooves on the top which are used to guide a yarn or cord. Stitches are sewn over cords placed into the foot as the foot guides them evenly, the gathering can also be done through this foot.

18. Sew and serge foot

The sew and serge foot is also known as the side cutter trims the excess fabric while sewing.

There are many other types of pressure foot specialized for various tasks. Most pressure feet are made of steel or clear plastic, but for sewing leather, plastic, vinyl, oilcloth pressure foot made of Teflon or other non-stick materials are also

used. To make the transition easier for the pressure foot they are equipped with easy snap features like:

- Some simply snap on or off the machine.
- Some are removed by pressing a lever or release button on the shank.
- Others are attached to the shank and need to be removed together with a small screwdriver.
- Some have the shank already attached and have to be removed completely to put the new foot on.

Pressure regulators

the pressure adjustment sets the amount of pressure that the presser foot will exert on the fabric. Downward pressure on the presser foot holds the fabric between the feed dog and sewing machine foot. The amount of pressure would need to vary if you were switching between lightweight sheer fabric and multiple layers of denim for the machine to feed the fabric evenly.

Stitch length

A stitch regulator is a tiny computer attached to a sewing machine that constantly adjusts the machine's stitch speed to accommodate the speed of the fabric during free-motion stitching. This ensures balanced, equal-length stitches.

Unit 3

Cutting technology

There are multiple types of cutting machines used in garment industry and they can be put into a few main categories, such as manual cutting machines, semi-automatic cutting machines, and computer controlled knife cutting machine. The methods differ by how they cut and what process the operator takes to make the cut.

Function

Working Process of Cutting Department in Apparel Industry:

The main purpose of cutting section involves cutting of garment panels precisely, consistent with the pattern shape and size as well as economically and in a necessary volume to keep the sewing department supplied with work.

Functions of Cutting Department in Garment Industry

The cutting department is responsible for cutting fabrics and feeding the sewing department with cuttings. The cutting department's capacity is planned based on the daily feeding requirement of the sewing lines. The cutting department is set up with a cutting department head, cutters, spreaders, quality checkers and helpers for sorting, ply numbering and bundling. The activities of the cutting department are explained in this post.

1. Take fabric from the fabric store:

The cutting department gets a cut order from the production manager. According to the cutting plan, the cutting in-charge generates a fabric requirement sheet or requisition slip to the fabric store to issue fabrics.

2. Relaxation of fabrics:

Knitted fabrics require relaxation before cutting. After receiving the fabric from the fabric store, the cutting department opens the fabric from the fabric roll and lays it on the table for relaxation for some hours before cutting. Factories also relax fabric in the fabric store overnight after opening the fabric rolls.

3. Cut order planning:

The cutting master plans the number of markers they need to prepare, the size combination to be set for each marker and the number of plies to be laid in each marker.

4. Fabric Spreading/ layering:

In mass production, multiple layers of fabric are cut at the same time. So spreaders lay the fabric on a cutting table as per total marker length. The layer height is kept up to a certain inch.

5. Planning markers:

The cutting master plans marker ways, marker lengths and the numbers of plies to be laid in each lay.

6. Making markers:

This is a process of making an outline of garment patterns on the lay for cutting garment components. After layering, the marker paper is laid on the top of the layer. Those factories that don't have CAD markers make markers manually using paper patterns.

7. Cutting fabrics:

After making the marker, garment patterns are cut and taken out from the layer. Various technologies are used for cutting fabric layers, such as straight knife cutting, band knife machine cutting and a computer-controlled automatic cutting machine.

8. Sorting, bundling and numbering of garment plies (parts):

cutting the fabric, layers are sorted size-wise and colour-wise. Each ply is numbered using stickers. Bundles are kept on inventory tables, before these are sent to undergo the next process.

9. Inspecting cut components:

To maintain the cutting quality, standard cutting components are checked randomly by quality checkers. If defective components are found, they replace those defective parts. Details of cut part inspection are explained in Chapter 10.

10. Sorting printed and embroidery panels:

As per order requirements, printing and embroidery is done on cut panels. Size-wise sorting is done after receiving printed and embroidered panels. The checking of printed and embroidered panels is also done by the cutting department

11. Re-cutting panels:

Re-cutting is done for garment components that require to be replaced in bundles. Re-cutting requests are received from the sewing department for defective garment parts. Re-cutting is also done for block panels cut for the printing and embroidery processes. After receiving garment panels from the printer or embroiderer, these panels are reshaped.

13. Fusing garment components:

Fusing in garment components is done to stiffen parts of a garment. If needed, fusing is done at the cutting section (e.g. fusing of the collar and cuff components of formal shirts).

The scope of cutting machine

Suitable for foam, cardboard, textile, plastic materials, leather, rubber, packaging materials, flooring, carpet, glass fiber, cork and non metal materials by punching cutting knife mold with machine stamping pressure of the material. Cutting equipment of high degree of automation: controlled by computer moving head cutting machine, laser cutting machine (oscillating tool), high-pressure water jet cutting machine, computer cutting machine. In addition, Italy and the UK USM company production is a projection cutting machine and oscillating type tool and visual observation device is arranged on the equipment and for contour scanning on the leather, or in the leather projection to guide cutting industry and trade arrangements material sample in the leather sleeve row.

Spreading:

Spreading is a preparatory operation for cutting. The main aim of the spreading process is to lay the several fabric plies essential for the production process to the marker length without any tension on the fabric. The lay height depends on order size, fabric characteristic, capacity of the spreader, cutting method and equipment used. The preference of mode of spreading will influence the cost of spreading as well as finished garment quality. The composition of each spread, i.e. the number of plies of each colour is obtained from the cut order plan.

Types of Fabric Spreads:

The spreads can be categorised into two basic types, namely, flat spread and stepped spread.

- **Flat spreads** (scrambled spread) – It is the economical method of spreading where a single section maker comprises patterns in the ratio that the style is ordered. Fabric is normally spread in multiples of the ratio of the marker. In this type of spread, all plies are of the same length.

- **Stepped spreads** (section spreads) – In this method, the spread is normally built like small steps, with all the fabric plies in a step having the same length. It is commonly used when the order needs to cut the imbalance between the quantities to be cut, which prevents the use of the flat spread. In most circumstances, the marker section with the need for the greatest number of plies is situated closest to the left of the spread. Then each section in the order of decreasing numbers of plies is located after the first going down the table.

Method of Spreading:

There are mainly two methods for spreading the fabric on the cutting table.

1. Manual method
2. Mechanical method

1. Manual method:

It does not fulfill the basic requirements.

- Fabric is laid completely by hand.
- With the help of mechanical assistance as roll cutter.
- With the help of manually operated spread truck.
- This is the most extensively used for small production because of cheap labor cost and availability of workers

2. Mechanical method:

It is possible to fulfill the basic requirements with mechanical method.

- **Semi Automatic spreading:** Semi automatic machine is working almost similar to Hand process with spreading track process because this methods working technique and working prouder are same but this process are working by electric motor.
- **Fully Automatic spreading:** Fully automatic machine is upgrade version of Semi Automatic. This machine has the all of quality which is included in Semi Automatic.
 - fabric cutting is an integral part of getting your project created. Whether you are creating designer clothes, quilts, curtains, or embroidery projects, you'll need to cut the fabric from the original bolt or another medium. Gone are the days when people used to rely on only scissors for this purpose and now the garment industry is moving towards fabric cutting machines of all shapes and sizes. They can create the perfect cuts to flatter every body shape and

know that they will have the same size consistently. This is especially important with ultra-expensive fabrics and hard-to-cut designs. These machines are also able to cut other materials, including metal, glass, paper, and plastic. There are multiple types of cutting machines used in garment industry and they can be put into a few main categories, such as manual cutting machines, semi-automatic cutting machines, and computer controlled knife cutting machine. The methods differ by how they cut and what process the operator takes to make the cut.

- Below you'll find each described to see which best works for you in each situation.

- **Manual Cutting Machines**

- Manual Cutting Machines are just one of the types of cutting machines used in garment industry. These are hand-operated mechanical machines that can cut, emboss, and punch holes in many different types of mediums. Here are the types of manual cutting machines:

- Hand Operated Scissors are the “old-reliable” solution and simplest fabric cutting tools to use. They can be used for cutting fabric or other thin mediums and have been used for thousands of years. In addition to just scissors, there are also shears. The best advice is to buy high-quality scissors or shears and use them judiciously. Keep them sharp and out of the hands of children. They are tried and trusted tools for almost any project. There are also style shears to add textures and shapes to the end of projects. These are used especially in scrapbooking and card making processes.

- **Die Cutter**

- Die Cutters use metal dies and pressure to cut outlines and create textures with embossing. You're limited to the amount of dies that you own and need additional dies for more shapes. Dies are placed on the medium

and then go through the machine. The pressure caused between the two plastic pieces and additional material cut allow the die to cut into the paper or fabric.

- There are digital computer die cutters as well. These use computer programs that can cut any medium and are simplified versions of the industrial automatic cutting machines. Die cutters are good solutions for the casual crafter and the digital options have many different options though you are limited to which brand you use moving forward.

Drill Cutter

Drill Cutters cut holes in fabric in given specific spots. These holes can later be used for rivets, attaching different fabrics to one another with anchor spots, or helping to build structure with darts or pleats. Normally power operated, drill cutters are compared by their punching power and like a drill press punch through the fabric or other medium's layers to create holes.

semi-Automatic Cutting Machine

Semi-Automatic Cutting Machines are another types of cutting machines used in garment industry. This is done in very different ways depending on the mode of cutting. Here are the different types:

Straight knife Cutting Machines

These use a straight knife that is similar to a sewing machine. An operator uses it along a pattern to cut out any shape by pushing the medium to all the vertical knife to cut. Though it is very quick, there are safety concerns. These can't be used by children and diligence is imperative during operation to make sure that there are no injuries.

Round knife Cutting Machines

Round knife Cutting Machines use rotary cut wheels to cut fabric. The round knife is like a pizza cutter and normally used for straight lines and large circles. [Rotary cutters](#) have less uses than their straight knife counterparts and are normally hand-powered and easy to use.

Band Knife Cutting Machine

Band knife Cutting Machines use a vertical knife similar to a straight knife cutting machine but with the band instead of a smaller knife, it is more heavy duty.

Corduroy, denim, foam, and tougher materials are easily cut with the band knife. Diligence must be used with the band knife cutting machine to ensure that there are no injuries. Like the straight knife cutting machines, children are not encouraged to use this product.

Die Cutting Machines

Die Cutting Machines that are semi-automatic. These have the capability of automatically advancing the assembly through the machine. This allows for more people to be able to use this device but like the manual cutting machine, you're limited to the number of dies you have. Semi-Automatic Die Cutters are limited to having an extension cord and are not as mobile as their manual counterparts.

Notcher Machine

Notcher Machines are perfect for creating perforations and ridges. [Perforations](#), whether they can allow for harder items to be punched out or adding textures, can be integral to some projects. This is normally a more specialty item but can be easily used and pivotal when needed. Notcher machines that don't punch through the whole depth of the material are similar to straight knife cutting machines.

rotary cutter is a tool generally used by **quilters** to cut **fabric**. It consists of a handle with a circular blade that rotates, thus the tool's name. Rotary cutter blades are very sharp, can be resharpened, and are available in different sizes: usually smaller blades are used to cut small curves, while larger blades are used to cut to straight lines and broad curves. Several layers of fabric can be cut simultaneously with a sharp (fresh) blade, making it easier to cut out patchwork pieces of the same shape and size than with **scissors**. Quilters use rotary cutters with specially designed templates and rulers made of approximately 1/8-inch thick clear or color-tinted plastic.

Band knife cutting machine:

Band knife machines provide the most accurate cutting and are therefore used in cutting small and complex shape components. The fabric plies are guided against the cutting device which is fixed and performs only a vertical movement down to the fabric. Because the band knife moves in only down direction, the friction between the knife and the material ensures the continuous compression of fabric plies throughout the process. Band knife machines may be used to cut fabric spreads up to 300 mm high.

A band knife machine has a working surface and a knife that forms a moving circle during the **fabric cutting** process (see Figure-1). During the work process the fabric is moved while the knife is in a fixed position and performs a continuous downward movement. The band knife is characterized by its length, width and thickness. The work surface of the machine is smooth and may be equipped with a special air blowing system to facilitate maneuverability of cut fabrics. The band knife machines can ensure the highest level of accuracy in manual cutting.

Die cutters

Die cutting is the general process of using a **die** to **shear webs** of low-strength materials, such as **rubber, fibre, foil, cloth, paper, corrugated fibreboard, chipboard, paperboard, plastics, pressure-sensitive adhesive tapes, foam, and sheet metal**. In the **metalworking** and **leather** industries, the process is known as clicking and the machine may be referred to as a clicking machine.^{[1][2]} When a dinking die or dinking machine is used, the process is known

as dinking.^{[1][3]} Commonly produced items using this process include **gaskets**,^[4] **labels**, tokens, corrugated **boxes**, and **envelopes**.

Die cutting started as a process of cutting leather for the shoe industry in the mid-19th century.^[5] It is now sophisticated enough to cut through just one layer of a **laminate**, so it is now used on labels, **stamps**, and other **stickers**; this type of die cutting is known as kiss cutting.^[6]

Die cutting can be done on either **flatbed** or **rotary presses**. Rotary die cutting is often done inline with **printing**. The primary difference between rotary die cutting and flatbed die cutting is that the flatbed is not as fast but the tools are cheaper. This process lends itself to smaller production runs where it is not as easy to absorb the added cost of a rotary die.

Computerized cutting machine

Introduction:

In this machine, cutting knife movement is controlled by a computer. Cutting table used for computer controlled **straight knife cutting machine** is different from normal cutting table. The table top is covered with a bed of nylon bristle. The nylon bristle bed is capable to support the fabric lay and also allows the straight knife to pass through and move around the nylon bristle. Hence cutting of each and every ply of fabric in the lay is confirmed. The nylon bristle bed also allows air suction through the bed to make the lay compressed by vacuum pressure.

When **fabric cutting** command is given through computer, the cutting knife starts lay cutting from a reference point starting in the computer memory of the marker. Notch point is made by the same cutting knife. Drill mark is also produced by a separate drill situated in the cutting head. Speed of cutting depends on lay height. For example, for a compressed lay of 7.5 cm height, cutting speed will be 7.5 meter per minute. As the cutting proceeds, the vacuum pressure may drop into the lay. To avoid the reduced vacuum pressure problem, another polythene sheet roll may be used to cover the cut portion of the lay. Computerized straight knife cutting machine does not require any use of marker. In some cases, marker may be used to identify the cut components.

Advantages:

1. Very fast fabric cutting;
2. Very accurate cutting;
3. Cutting speed could be varied;
4. Cutting knife could be rotated and moved at any angle;
5. Suitable for large scale production;
6. Can be connected with [computerized marker making](#);
7. Fabric is compressed by vacuum facilitates cutting;
8. Cutting defect is negligible;
9. No possibility of blade deflection;
10. Blade sharpening is attached;
11. Possibility of accident is lower;
12. No need of marker;
13. Lower labor cost;
14. 6 to 8 times faster cutting.

Disadvantages:

1. Initial investment cost is very high;
2. Maintenance cost is also very high;
3. Skilled operator is needed.

Marking methods

Marking Methods are ways in which a clothing item are marked. There are many things in a pattern that need marks. Notches match up to notches, Dots to dots, some lines create a dart. Here are some marking methods that can be used with discretion. The goal is to create something that looks like it hasn't been marked. Always test a method before you actually use it.

Good methods:

[Tailor's tack](#)

Hand basting

Scissors (for notches)

[Pinning](#) (Watch out, if storing a project after marking, pins can fall out.)

Chalk Marker

Invisible Pen (Test first!)

Never use:

Pencil

Pen

Marking the Fabric

To help with accurate piecing of the garment pieces, there are various notches, dots, triangles and lines on the pattern pieces. These need to be carefully transferred to the wrong side of the fabric. Never risk using a marking implement on the face side of the garment.

There is a wide range of marking methods and tools. The choice of marking method I use is always dependant on the fabric, style elements and where the marks need to be placed.

all pens and pencil markers are best kept for markings in the seam allowances so that there is no chance that a permanent mark will show on the final garment. For stable, non slippery fabric, pin marking works very well and is very accurate. It is necessary to place the pins right before sewing the garment piece as they may leave marks if left in the fabric for any length of time.

Small snips (no more than 6mm in a 15mm seam allowance) are also a quick and accurate method for marks at the cut edges. Simply remove the notches when cutting out the fabric and place the tip of sharp scissors in the middle of each notch and at centre front and centre back edges and make a small snip. The only drawback with this method is that if the fabric edges are finished before the pieces are joined together, the clips will disappear.

Chalk markers can be used in both within the seam allowance and in the body of the garment (for example when marking grain lines, pocket placements, centre front line, etc.).

If the garment has complex elements (unusually shaped pieces, sharp corners or curves) the best and most accurate marking method is to use dressmaker's carbon paper and a tracing wheel. Just be sure to use the palest colour that can be seen on the fabric (I usually stick to white) so that the coloured lines will not be seen through to the face of the fabric. If you are using an underlining, the marks should be transferred to this layer which is attached to the main fabric and sewn together – thus avoiding any possibility of the marks showing on the right side of the garment.

Slide the tracing carbon between the pattern and upper layer of fabric. With a piece of cardboard or the underside of a rotary cutting mat under the piece, use the tracing wheel to run along all grain, seam and placement lines and through notches, dots, triangles etc.

Once the first piece of fabric has been marked, carefully remove the pattern and pin the fabric pieces together. With the carbon paper face up against the bottom layer, trace over the previous marks to transfer them accurately to the second piece. In areas where it is necessary for specific construction techniques to see the marks on the right side of the fabric, thread trace the marks with embroidery floss (one strand is usually sufficient). This is particularly useful to mark the centre front and grainlines through to the right side which greatly assists when checking the fit of the garment. The other benefit of hand stitching marks is that they will not come out of the fabric until you remove them – how many times have we had to get the pattern out to see a mark that has faded?

Tailor's tacks using the same embroidery floss are great for placement marks for pleats and tucks. Whichever method is chosen, it is extremely important to test on a scrap of the fabric to be sure it will achieve the desired result and not cause unexpected problems.

Positioning marking

“Marking” refers to the process of placing pattern pieces to maximize the number of patterns that can be cut out of a given piece of fabric. ...

After marking the garment manufacturer will get the idea of how much fabric he has to order in advance for the construction of garments.

Marking your fabric is a standard part of sewing but understanding the different types of marking tools on the market is a totally different ballgame. Let's explore our options and helpful tips on when to use.

Whether you're tracing a template or transferring pattern markings, the type of tool that works best will depend on the type of fabric you're using and the purpose you need it to fill. Always test your marking tool on a scrap piece of the same fabric first, because you just never know when a mark is going to be stubborn and refuse to come out! It's always better to be safe than sorry

.

Types of Marking Tools

Disappearing Ink Marker – This marker often has two ends – a water-soluble tip and a disappearing ink tip. If you use the water-soluble end, you'll have to wash your fabric before you can get rid of the markings, but the benefit is that the

markings will stay on your fabric for the duration of your sewing project. The disappearing ink doesn't require washing, but it will (usually) disappear on its own so it may go away faster than you wanted it to.

- Caution: Make sure the disappearing ink has actually disappeared before you wash it, as the Sewing & Craft Alliance reports that detergent will permanently set this type of ink. Another warning from SCA? The chemicals in these markers deteriorate fabrics over time, so if you're planning that heirloom quilt project, these might not be your best choice.

Fabric Pencils – Fabric pencils are water-soluble like markers. The problem is that the lines they draw are often very hard to see, but the benefit to pencils is that you can always sharpen them to get a fresh tip and they won't dry out.

- Tip: Use these pencils on darker fabrics; their light colors will be easier to see.
- Caution: If the pencil forces you to apply a lot of pressure in order to see the marks you're making, get a new marking tool. Putting that much pressure on the fabric can warp the grain before you sew it.

Tailor's Chalk – Tailor's chalk usually comes in the shape of a flat triangle or rectangle. Tailor's chalk will rub right off the fabric when you're finished with the markings, so it generally carries less risk than using a pencil or marker. The down side is that it can be messy, and sometimes the light coloring is difficult to see on light fabrics. Tailor's chalk also comes in pencil form, which may be easier to use.

- Tip: Keep your tailor's chalk sharp for thin lines.
- Caution: Some tailor's chinks contain wax. Test with an iron on a scrap fabric to see if you can find a waxy residue left on your fabric after marking.

Tracing Wheel and Paper – Roll a tracing wheel onto your fabric to create a series of small indentations that will serve as temporary marks. Similar to carbon paper, tracing paper transfers markings with applied pressure. Simply sandwich the tracing paper between your fabric and your pattern and then use the tracing wheel to mark over the pattern outlines and markings.

- Tip: Choose a color for your tracing paper that will show up on your fabric without being so dark that it shows through to the other side.
- Caution: Only use tracing paper on the back or wrong side of your fabric.

Tailor's Wax – Tailor's wax is like a crayon you can use to mark your fabric. Since it is made of wax, you run the risk of staining your fabric. In theory it will come off with the heat of the iron, but that isn't always true.

- Tip: Tailor's wax can be very useful with a heavy or thick fabric, such as wool.
- Caution: Wax sometimes leaves residue on your fabric that can't be removed, much like grease!

These regular household items may be just what you need in a pinch. Like if your fabric tool has just run out.

- School chalk – Sharpen a stick of traditional chalkboard chalk using a hand-held pencil sharpener.
- Ballpoint pen – A ballpoint pen isn't going to wash out of your fabric the way an actual fabric marking pen will but it works well in areas that won't be seen.
- Drawing marker – Raid your kid's art supplies and find a marker for your next sewing project. A washable marker should wash out of the fabric when you're finished.
- Permanent markers – if you're using a fabric that is particularly thick and nubby, such as fleece, a permanent marker might be just the thing you need. The sturdy, pointed tip will power through the bumps on the fabric and the line is sure to stay put when you're finished drawing.
- Soap – A bar of white soap will draw on your fabric like tailor's chalk, and wash out when you're finished.
- Needle and thread – Some fabrics just won't play nicely with any type of marking tool. In this case, thread a needle with a contrasting color of sewing or embroidery thread and use that to mark your pattern pieces. You can sew right through the thin pattern paper so your markings will be spot-on with accuracy. When you're finished with the marked portion of your sewing project, simply snip and remove the extra thread.

Notches

Pattern notches are small marks made on the pattern to ensure that one pattern piece will match up to the pattern next to it. They can be used to show what the value of the seam allowance is, and can also be used as markers along a seam to make sure that the two pieces of fabric will come together correctly when sewn.

Drills and computer aided markers

In sewing and fashion design, a pattern is the template from which the parts of a garment are traced onto fabric before being cut out and assembled. Patterns are usually made of paper, and are sometimes made of sturdier materials like paperboard or cardboard if they need to be more robust to withstand repeated use. The process of making or cutting patterns is sometimes condensed to the one-word Patternmaking, but it can also be written pattern(-)making or pattern cutting..

A sloper pattern (home sewing) or block pattern (industrial production) is a custom-fitted, basic pattern from which patterns for many different styles can be developed. The process of changing the size of a finished pattern is called grading.

sewing and fashion design, a pattern is the template from which the parts of a garment are traced onto fabric before being cut out and assembled. Patterns are usually made of paper, and are sometimes made of sturdier materials like paperboard or cardboard if they need to be more robust to withstand repeated use. The process of making or cutting patterns is sometimes condensed to the one-word Patternmaking, but it can also be written pattern(-)making or pattern cutting.

Computer-aided pattern making is the computerized version of hand-drawn patterns. There are many software companies across the globe that provides their apparel CAD solution. Apparel CAD systems were introduced in the early eighties of the twentieth century and have seen a rapid growth hence. Main functions of the complete CAD package are pattern making, digitizing of patterns, pattern grading, and marker making, and plotting. (Glock & Kunz, 2000).⁶ Latest versions of CAD systems are 3-D trials and scanning of patterns by a camera that has a potential to replace digitizing boards.

The functions of apparel CAD systems are mentioned above are briefly explained below:

(i) **Making the first patterns:** First patterns according to the garment styles are developed on the computer. The CAD system provides the working area and required tools for drawing straight lines, curvatures, pleats, darts, button, notches etc. With a basic training, the operator can start working on the system and can gradually learn all the tools provided in the Computer aided cutting in Indian garment industry: a change agent 26 Copyright: ©2019 Agrawal et al. Citation: Agrawal B, Datta DB. Computer aided cutting in Indian garment industry: a change agent. J Textile Eng Fashion Technol. 2019;5(1):23–27. DOI: 10.15406/jteft.2019.05.00176 system. Measurements of curvatures are accurate and matching of seams and curvatures of two mating parts is much easier in CAD system.

(ii) **Digitization of patterns:** Digitization is the process of feeding the paper patterns in the memory of the computer through the digitizing boards and digi pens or digital mouse. The digitized patterns are retrieved for modifications and adaptations of further styles. Now a company like Gerber and Lectra are coming up with their scanning cameras, which are making the process of digitization of paper patterns easier and faster. Chance of errors in capturing the exact contour of patterns is comparatively less. (Gerber, 2018).⁷

(iii) **Grading of different sizes:** “Apparel Grading is the process of increasing or decreasing the base size pattern according to a set of body measurements and proportion relationships to develop a range of sizes for production”, (Bye et al. 2008).⁸ This process was accomplished manually before the use of computers in

apparel industry but with the apparel CAD systems available in the market, Grading of the base size is done in a computer now, which still needs a lot of expertise to be accurate. With correct understanding and practice, it can be executed with precision. Grading of fullness and suppressions like pleats and darts can also be done with accuracy and with ease.

(iv) **Marker making:** Marker making in a CAD system is a simple and useful technique that facilitates easy and fast correction of the marker without any kind of paper wastage. The screen of the computer provides a scaled-down work area that takes care of factors like fabric width and surface design of the fabric to be cut. The operator can place the patterns with the help of the mouse in the marker area and can change the location of patterns as much time as he/she wants before being satisfied. Any type of error is captured by the system and signal generates visually as well by audio signals. All apparel CAD systems also provide the facility of auto markers, which are generated by the computer.

Unit5

Federal standards for stitch and seam classification

Seams

In garment assembling process, two or more plies of fabric or other materials are detained by rows of stitches known as a seam. Seams are generally categorized based on the seam type as superimposed seam, lapped seam, bound seam, flat seam and based on their location in the completed garment such as center back seam, inseam and side seam. Seams finishing can be carried out with a range of methods to prevent unraveling of fabric raw edges as well as to neaten seam edges on the inside of garments. The type of seam and sewing thread used will vary with each application.

Classification of Seam:

Seams are classified based on the type/number of fabric components used. Eight classes of seams are defined by ISO 4916:1991. Conventionally, the seams were classified as flat, superimposed, lapped or bound seam and stitching was defined as edge finishing or ornamental. The ranges of seams are given below together with their descriptions under the above and the new system of seam classification.

Different types or classification of seams are given below:

1. Class 1: Superimposed seam
2. Class 2: Lapped seam
3. Class 3: Bound seam
4. Class 4: Flat seam
5. Class 5: Decorative/ornamental stitching
6. Class 6: Edge finishing/neatening
7. Class 7: Attaching of separate items
8. Class 8: Single ply construction

Superimposed Seam (SS)

The arrangement of fabric layers for superimposed seams is shown in Figure-1. In this kind of seam, normally two or more fabric panels are superimposed over one another and seaming was done near an edge, with one or several rows of stitches.

Lapped Seam (LS)

In this type of seam, two or more fabric plies are lapped with the raw edges, flat or folded and attached with one or several rows of stitches as shown in Figure-2. The lap felled seam is the mostly used seam in this class, which involves one stitching operation. It is a strong seam with fabric edges, generally used to safeguard jeans fabric from fraying. The 401 chain stitch class is commonly used for lap felled seams in jeans because of its strong construction. Another class of lapped seam, French seam, comprises a two stitching process with a superseding folding operation. It is a flat, folded seam with only one row of stitching noticeable on the face side of fabric and involves a minimum of two components and can have different variations comprising a number of rows of stitching. It is commonly used for rain wear, and edge stitching front facings on jackets and dresses.

Bound Seam (BS)

In this kind of seam, the binding strip is folded on the edge of the base fabric plies and is stitched at the edges along with the fabric plies with one or several rows of stitches (Figure-3). This makes a neat fabric edge on a seam exposed to view. A 401 chain stitch or 301 lock stitch class of stitches is normally used for seaming bound seams and it is utilized for finishing sleeve hems, necklines, finishing seams on unlined jackets and coats, finishing raw edges, continuing the motif design of lace, etc.

Flat Seam (FS)

This seam is also called a butt seam as the edges of the fabrics do not overlay one another, they will be butted together. In this seam type, two fabric edges in flat or folded conditions are brought together and over sewn with stitches as shown in Figure-4. The main purpose of this seam is to provide a joint without any extra thickness of fabric at the seam, as needed in underwear or foundation garments. The bottom threads (looper thread) should be softer as well as stronger and the cover thread should be decorative as well as stronger. The flat seam is normally sewn with a zigzag lock stitch, chain stitch or covering stitch. This kind of seam will comprise two components and could be seen on knitted garments where seams are required to be free from bulk.

Decorative/Ornamental Stitching

The decorative or ornamental stitch (Figure-5) is a series of stitches down a straight or curved line or following an ornamental design on a single fabric ply. A more intricate kind of stitch involves various systems of piping, producing an elevated line along the fabric surface. The stitching in a single fabric ply resulted in decorative effects on the fabric surface like pin tucks

Edge Finishing/Neatening

Edge neatening stitch (Figure-6) could be seen where the edge of a single fabric ply is folded or covered with a stitch. The simplest of this process is known as 'Serging' where the raw edge of the fabric is secured by overedge stitching to prevent fraying of edges as well as edge neatening. This seam class involves seams whereby the edges are neatened by means of stitches and could be utilised in circumstances where the raw edge of fabric needs finishing.

Edge Stitched Seam

This kind of seam involves seams that need the inclusion of another component at the edge of a fabric ply, for example, elastic braid inserted onto the edge of ladies . This kind of seam requires two components.

Class 8: Enclosed Seam

In this kind of seam class, only one piece of strip of fabric is turned on both edges. The general application of enclosed seams could be found in belt loops or belts for which a folder attachment can be done on the machine

Seam Quality:

Though the type of stitches selected for a seam depends on the functional as well as aesthetic requirements, the following factors have to be taken into account for seam quality.

- **Seam size:** Expressed by seam length, seam width and depth.
- **Seam slippage strength:** It is the force required to draw out a 0.25" of the opposing sets of yarns which are perpendicular to the seam line.
- **Seam strength:** It is the force required to break the seam either by breaking the sewing thread or by breaking the sewn material.

Fabric sew ability

Fabric sewability is defined as the ability with which fabric can be sewed (seaming and stitching) quantitatively. Some fabrics which meet all of the requirements can not be sewn into acceptable garments because of the susceptibility of their yarns to damage by the sewing needle. Primarily, it is due to lack of mobility of the yarns; instead of moving when the needle penetrates the fabric structure, these yarns remain taut and hence are severed. The sewability of a fabric, or the degree of its 90 resistance to needle damage, can be determined in

two ways. One measure, is the proportion of fabric yarns cut by the needle. Another is the loss in fabric strength occasioned by needle damage. For sometime, testbased on yarn severance appeared in certain military fabric specifications, since this test did not approximate actual sewing conditions to the extent necessary for a realistic picture, it failed to detect poor sewability of a fabric that was so susceptible to needle damage that several manufacturers reported that they could not make garments of acceptable quality from it.

Classification of sewing machine

A sewing machine controls the fabric with feeding devices and forms a perfect stitch to join the fabrics. It has various parts and attachments, each of which have their own importance and use. There are mainly two categories of sewing machines that is, domestic sewing machine and industrial sewing machine

Classification of Sewing Machine:

Sewing machines are normally considered general working and from the perspective of its technical features sewing machines could be

1. Basic sewing machines comprise machines that sew with a lock stitch and multi-thread chain stitch. These are mainly intended for attaching garment components that are not exposed to high amounts of loads during wear using a lock stitch. Garment components that undergo higher load during wear require basic sewing machines that utilise multi-thread chain stitch.
2. Special sewing machines are proposed for specific technological operations and they can be categorised by (i) function, such as machines for pocket piping, sewing zips, knitted fabrics, etc. and (ii) stitch class and types except 301 and 401 stitch types, with blind stitch, zigzag stitch, for attaching pocket bags, etc.
3. Sewing automata are sophisticated specialised machines. The key features of these kinds of machines are its capability to perform automatic sewing when the fabric is positioned and the machine is actuated, cut the thread after sewing, release the fabric, etc.
4. Sewing systems are under advanced sewing machines. They have all the features of sewing automata and facilitate the automatic performances of two or more sub-operations.
5. Numerical-controlled sewing machines are machines where the fabric is guided automatically as in the case of sewing automata and sewing systems, but which follows a predetermined seam contour line. The numerical data are stored in the

memory of a computer.

6. Robotic sewing systems have a multifunctional manipulator, where reprogramming and designing possibilities can be enabled for easy sewing.

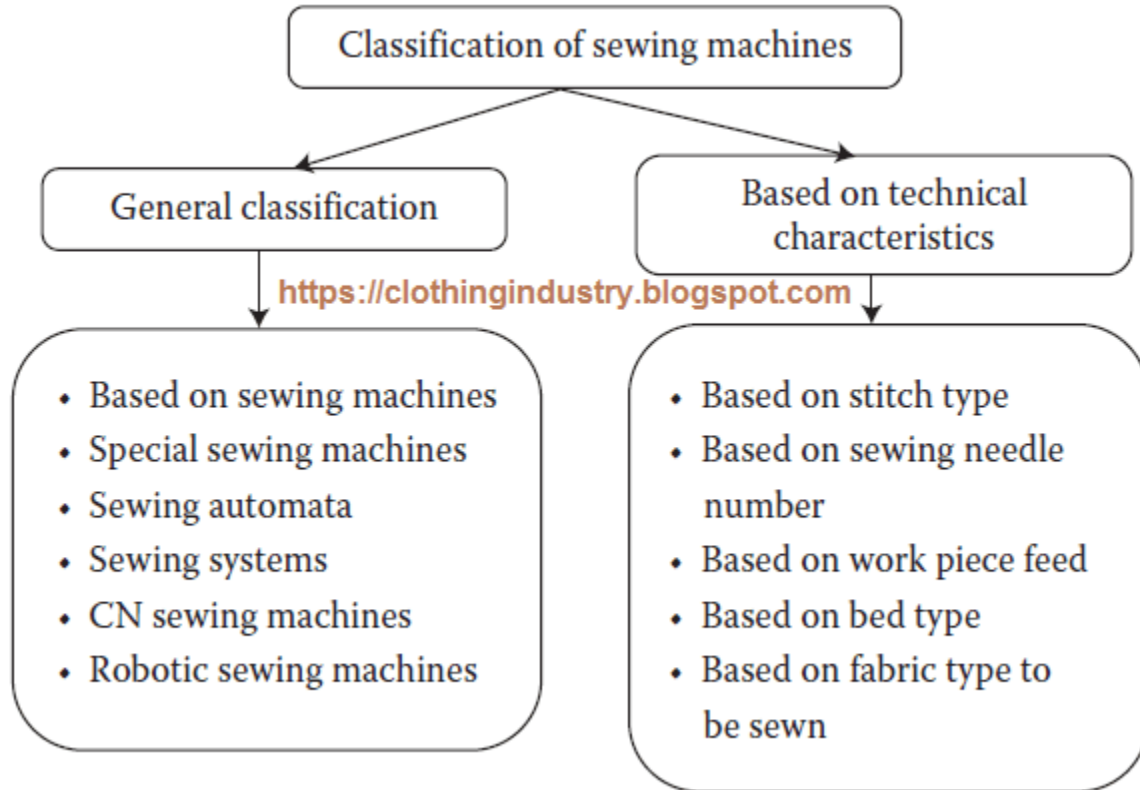


Figure-1: Classification of sewing machines

Sewing Machine Classification Based on Its Bed Type:

The machine bed is the lower part of the machine and feed dog and loopers are positioned beneath it. Table-1 shows the various kinds of machine beds along with their uses.

The bed of a sewing machine is that part of the sewing machine on (or against) which the fabric rests while it is being sewn. The classification of sewing machine bed types or shape types is done based on the manner in which the fabric falls, behaves and travels with respect to the bed during the course of sewing, to enable easier movement of materials around the machine.

Table-1: Sewing machine classification based on its bed type

Sewing Machine	Features and Applications	Stitch Type
Flat-bed machine	A vast working space permits a wide range of sewing applications and is utilised for all types of flat sewing work.	Lock and chain stitch
Raised bed machine	The machine bed is in the form of a pedestal which helps in assembling of pre-sewn parts. This is specifically used for attachment of accessories and special attachments.	Lock and chain stitch
Post bed machine	It has a raised working machine bed and is used for stitching of three dimensional products such as shoes and bags.	Lock and chain stitch
Cylinder bed	It has a horizontal	Lock and chain

machine	arm-shaped bed as well as increased working height. It is most suited for sewing tubular components like sleeves, cuffs and trouser legs, and can also be utilised for button sewing and bar tacking.	stitch
Side bed machine or feed of the arm sewing machine	These are dedicated for edge sewing and requires a lesser working space	Chain and over-edge stitch

Classification of Sewing Machine Based on Machine Type:

The sewing machine classification based on the machine type is given in Table-2.

Table-2: Classification of sewing machine based on machine type

Machine Types	Applications
1. Lock stitch machine	Straight and zigzag seams
2. Chain stitch machine	
3. Double chain stitch machine	
4. Blind stitch machine	Blind stitch and hemming
5. Linking machine	Linking machine attaching trimming and

	cuff of knitted fabrics.
6. Over-edge machine	Edge neatening and seam closing
7. Safety stitch machine	Safety stitching
8. Buttonhole machine	Specific sewing operation
9. Button sewing machine	
10. Bar tack sewing machine	
11. Profile sewer	Automatic, complex sewing operation
12. Pocket sewer	

Attachments to sewing machines:

Generally sewing attachment means [sewing machine parts](#) and accessories. Sewing machine attachments make sewing machines easier and provide a variety of decorative sewing possibilities. These sewing machine attachments are mechanisms that are attached to sewing machines without cutting through or changing the original frame of the machine. The removal of such an attachment leaves the machine in its original condition.

These attachments are fastened to the machines by screws or nuts and bolts. These are static, dynamic or synchronised; static attachments do not move during the sewing work cycle; dynamic attachments are moved by the operator during the sewing work-cycle. Synchronised attachments have a link (or links) connected directly or indirectly to one of the driveshafts of the [sewing machine](#). The moving link has a motion [pattern](#) that positions the fabric during the sewing element of the operation work-cycle. This positioning pattern must be synchronised with the stitching or feeding action of the machine.

Classification and Functions of Sewing Machine Attachments: The majority of the attachments are normally secured to the presser bar instead of the foot. A few sewing attachments have hooked ends that rest on the needle clamp. The following lists the classes and types of sewing machine attachments:

1. Position attachments
2. Guide attachments
3. Preparation and finishing attachments

1. Position Attachments:

Hemmers:

Hemmers (Figure-1) construct hems from 3/16" to 7/8" wide, right on the sewing machine. Machine hemming with the hemmer attachments could save plenty of time compared to hand turning and basting. The hemming portion is automatically turned by the hemmer, and simultaneously the line of stitching is guided close to the edge of the hem. Hems are normally done at various widths, which can be made with the hemmers, suitable for the common requirements. **uffler:**

The ruffler attachment has the capacity of doing gathering or pleated frills as shown in Figure-2. It is normally utilised for making children's clothes and curtains. The means of utilising the ruffler attachment varies with different sewing machines.

Binder:

It is a valuable attachment in a sewing machine. Though fine bindings can be created by hand, the binding using the attachment on the machine saves a lot of time and is precise and accurate as shown in Figure-3. It is commonly utilised for applying readymade bias binding to a straight or curved edge and is a useful attachment for trimming dresses, etc. The binder attachment has a small funnel-like portion for folding and guiding the binding over the edge of the fabric before it reaches the [sewing needle](#). This attachment could be used for sewing straight, zigzag as well as decorative stitches.

Tucker:

This attachment is used for creating uniform tucks from 1/8" to 1" width. Finest pin tucks having 3/4" width could be created easily without any basting. Delicate twin-needle pin tucks are a breeze with the grooves on the base of the presser foot as shown in Figure-6. The pin tucking foot is used in conjunction with a 2-mm twin [sewing needle](#) to make multiple rows of pin tucks. The grooves on the base of the pin tuck foot make it easy to stitch multiple rows parallel and uniformly spaced from each other.

Gathering foot:

The gathering foot attachment (Figure-7) is used for making soft gathers swiftly particularly in lightweight fabrics. The gather size in the garment depends upon the fabric [GSM](#), tension of the needle thread and stitches per inch. The base of the gathering foot is raised up at the back of the sewing needle and has a thicker bar

section in front of the sewing needle for gathering and ruffling of fabric simultaneously.

Guide Attachments

Zipper foot:

The zipper foot could be set to stitch on both sides of the zipper (Figure-8). The edge of the foot directs the zipper to make sure placement is straight. Normally ready-to-wear garments will commonly have an invisible zipper fitted onto them. Invisible (concealed) zippers are appropriate for all garments made from fine silk jersey through to suit weight wools and tweeds, which can be secured on the garments using a concealed zipper foot (Figure-9). The grooves underneath the concealed zipper foot contain the zipper teeth and hold them in place during stitching. The main criterion is to get the needle as close to the zipper as possible, which this foot achieves by slightly unrolling the zipper just before the needle. An adjustable zipper foot (Figure-10) can also be set to sew on each side of the zipper by regulating the location of the foot and tightening the screw.

ording foot:

The 3-way cording foot (Figure-11) will grip three fine cords or threads. Since it is attached to the presser foot, the requisite design can be easily followed and the cords are perfectly placed. A range of functional or decorative stitches could be sewn over the cords to put them onto base fabrics.

Button sewing foot:

The two bars in the button sewing foot (Figure-13) are fixed to the shank of the presser foot to give additional firmness and it has a rubber sleeve for better gripping of the button during sewing.

Buttonhole stabiliser plate:

With the buttonhole foot (Figure-14), which is secured to the buttonhole stabiliser plate, the machine feeds a range of fabrics and uneven layers smoothly instead of causing the needle to stick in position.

Buttonhole foot:

The buttonhole foot (Figure-15) is used for sewing buttonholes on the fabric. Two kinds of buttonhole foot are available, namely, transparent buttonhole foot and sliding buttonhole foot. The transparent buttonhole foot is used for stitching buttonholes on tight zones like cuffs and a sliding-type foot is used for stitching buttonholes on areas where more freedom of movement is essential.

Preparation and Finishing Attachments:

- **Pinking:** It is a common finishing operation on garments. A power pinker is normally used for this purpose or pinking mechanism could be attached to the sewing machine. The two major actions carried out by the pinkers are chopping and cutting.
- **Pressing attachments:** It is used for finishing garments after the fabric is sewed. For example, on a belt loop attachment process where a flat iron or rotary press pressing device is attached to the machine head.
- **Thread cutters:** These are extensively required alternatives that minimise production time and get rid of manual thread clipping. On a few machines, sewing threads are cut beneath the throat plate, and a wiper pulls the residue portion of cut thread out of the way in preparation for the next process. Most of the 400, 500 and 600 class stitch machines have chain cutters and latch back devices built-in since the chain stitch formed by these kinds of machines should not be broken by a hand-tearing action.
- **Chain cutters:** The chain cutters cut the chains in such a way that the stitch is secured against unravelling. Stitches produced on these machines cannot be cut as close as like in lock stitch machines, and some remnant thread remains.
- **Tape cutters:** It could be used with the application of shoulder reinforcements, neck bindings, elastic, lace and so on. As stitching is finished, a photocell sensor finds the fabric end or piece and connects the cutter automatically. Tape may be cut at the beginning and end of the garment piece.
- **Needle and stitch devices:** On several sewing machines, options are designed especially for assisting in the construction of the perfect line of stitches such as needle positioners and stitch pattern regulators.

Sewing supplies

In sewing and haberdashery, notions are small objects or accessories, including items that are sewn or otherwise attached to a finished article, such as buttons, snaps, and collar stays. Notions also include the small tools used in sewing, such as needles, thread, pins, marking pens, elastic, and seam rippers.

Sewing threads

Sewing threads are special kinds of yarns that are engineered and designed to pass through a sewing machine rapidly. They form efficient stitches without breaking or becoming distorted during the useful life of the product. The basic function of a thread is to deliver aesthetics and performance in stitches and seams.

Sewing thread is an integral part of many items that we use daily. The various components of our apparel are joined with thread but what about the string that is attached to our tea bags? What would happen to the upholstery, seat belts and head liner of an automobile if the thread were removed? What about the seams in tents, backpacks, sleeping bags and other camping equipment? How are the components of baseballs and footballs joined? Each of these products requires a thread with different physical properties to achieve optimum performance. When the many uses of thread are considered, the complexity of designing a thread becomes apparent.

Factors to consider when choosing the right thread are:

- sewability of the seam;
- thread loop strength;
- linear strength;
- elongation;
- shrinkage;
- abrasion resistance;
- colour fastness;
- resistance to chemicals, heat, light, etc.

In addition, when sewing the garment together in production, other factors to consider are:

- the required seam strength;
- type of seam;
- stitch type;
- stitch density (stitches per centimetre);
- type of material being sewn;
- type of sewing machine and related equipment;
- conditions under which the product must perform;
- normal life of product;
- cost effectiveness.

Embroidery thread

Embroidery thread is yarn that is manufactured or hand-spun specifically for embroidery and other forms of needlework.

Threads for hand embroidery include

- Crewel yarn is a fine 2-ply yarn of wool or, less often, a wool-like acrylic.
- Embroidery floss or stranded cotton is a loosely twisted, slightly glossy 6-strand thread, usually of cotton but also manufactured in silk, linen, and rayon. Cotton floss is the standard thread for cross-stitch. Extremely shiny rayon floss is characteristic of Brazilian embroidery. Historically, stranded silk embroidery threads were described as sleaved or sleided in the sixteenth century.^{[2][3]}
- Filoselle is a historical term for embroidery floss made using the leftover waste from reeled silk.^[4]
- Matte embroidery cotton or French coton à broder is a matte-finish (not glossy) twisted 5-ply thread.
- Medici or broder medici is a fine, light-weight wool thread formerly manufactured by DMC Group.
- Perle cotton, pearl cotton, or French coton perlé is an S-twisted, 2-ply thread with high sheen, sold in five sizes or weights (No. 3, 5, 8, 12 and 16 (Finca), with 3 being the heaviest and 16 the finest).
- Persian yarn is a loosely twisted 3-strand yarn of wool or acrylic, often used for needlepoint.
- Tapestry yarn or tapestry wool is a tightly twisted 4-ply yarn.

Threads for machine embroidery are usually of polyester or rayon (less often cotton or silk).

Threads, like textiles, can contain compounds that may be harmful to humans. Many dyes have been shown to be allergenic and in some cases carcinogenic.^{[5][6]} Testing for the presence of these dyes, and other additives can be done at many commercial laboratories.

Certification to the Oeko-tex standard may also be applied for. This tests the component for over 100 different chemicals and certifies the component according to human ecological safety.

Metallic thread

Metallic thread generally refers to the round, twisted speciality thread that is created by twisting and bonding a fine metallic foil around a strong core to create an exceptionally smooth, strong and pliable thread. The resultant thread has the shine of a real metal – be it silver, gold or bronze. They are mostly available in the shades of soft silver, silver, black-gold, bright gold, copper, and soft gold.

Nowadays Metallic thread looks like they are made of metal but are actually made of a synthetic material. But earlier Metallic thread used to consist of thin strips of metal (usually silver) wrapped around a silk or linen fiber; Now it is made with a special type of plastic coated with metallic finish.

In goldwork embroidery metallic threads are used on their own fully, in all their glory – as a [filling stitch](#) as well as [outline stitch](#).

Elastic thread

Elastic thread is used with stretchy fabrics and materials like jersey cotton and elastic. In many cases, a zigzag or stretch stitch with regular thread will provide enough give to work with stretchy materials, but elastic thread can be used for certain cases.

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In many cases, a [zigzag](#) or stretch stitch with regular thread will provide enough give to work with stretchy materials, but elastic thread can be used for certain cases. See [How to Sew Stretch Fabric](#) for tips on working with stretchy fabrics.

Elastic thread is used in the bobbin in combination with regular thread in the top stitch because the elastic thread is too thick to be threaded through the machine.

Note that the amount of stretch is limited by the regular thread.

Elastic thread is great for elastic waist bands, [ruffles](#), and techniques like shirring.

You can get a smocked look by [shirring the fabric](#) using elastic thread

using elastic thread:

- [How to Shirr Fabric](#)
- [How to Make a Smocked Tube Top](#)
- [How to Make Pleated & Gathered Ruffles](#)
- [How to Sew a Tiered Ruffle Skirt](#)