3.4 DESIGN TO DISPATCH

DETAILED CONTENTS

UNIT I: Design Development

Research

Market Research

The fashion industry is a highly competitive and constantly evolving market. In order to stay ahead of the game, it is essential for fashion companies to conduct market research to gain insights into consumer preferences, trends, and competitors. Market research in fashion can take many forms, but there are several main methods that are commonly used. Market research can be defined as, “Systematic and objective approach to the development and provision of information for the marketing management decision making process.”

Primary research

Primary research is research that is conducted firsthand by the company or organization. This type of research can include surveys, focus groups, and interviews. Surveys can be conducted online or through mail or telephone. Focus groups involve bringing a small group of consumers together to discuss a specific product or topic. Interviews can be held in a group or one-on-one environment.

Secondary research

Secondary research is research that has already been conducted by another organization or company. This type of research can include reports, articles, and statistics from industry associations, government agencies, and market research firms. This type of research is generally less expensive than primary research and can provide a broad overview of the market.

Observational research

Observational research involves observing consumers in their natural environment. This type of research can be conducted in stores, at events, or in public spaces. This method can provide valuable insights into consumer behavior and preferences.

Online research

Online research has become increasingly popular in recent years. This type of research can include online surveys, social media monitoring, and online focus groups. Online research can provide a large amount of data in a relatively short period of time.

Advantages of market research in fashion

Market research in fashion has many advantages for companies. One of the main advantages is that it allows companies to stay ahead of the game and understand current trends and consumer preferences. As a result, businesses may be able to produce more successful items. Market research also allows companies to identify potential new markets and target specific segments of consumers.

Disadvantages of market research in fashion

Despite the many advantages of market research in fashion, there are also some disadvantages. One of the main disadvantages is that it can be expensive to conduct. Primary research, such as surveys and focus groups, can be costly to administer and analyze. Secondary research can also be expensive, as many reports and statistics are not available for free. Another disadvantage of market research in fashion is that it can be time-consuming.

The success of any apparel industry depends on determining the need and want of the consumer for this one must conduct following researches:

1. Consumer research- It provides information about consumer characteristics and consumer behavior.
2. Product Research- It provides information about preferred product design and characteristics.
3. Market analysis- It provides information about general market trends.

Fashion trend research

Fashion trend research is a daily activity for designer and merchandiser. Trend research activities include reading and scanning appropriate trade publications and exploring various market segments.

Fashion forecasting

Predicting what new fashions will come in the future by observing past fashion trends is called fashion forecasting. Through this, it is known what new designs will come in the future. For this reason, this forecasting is done by considering various situations including future trends, people's demands.

Types of Fashion Forecasting:

There are generally two types of fashion forecasting.

1. Short term Forecasting
2. Long term Forecasting

1. Short term forecasting:

Short term forecasting is usually done for one or two years. What kind of color will come in fashion, what style will be accepted as fashion is known through this forecasting. It is considered as an internal business matter. Short term forecasting is made based on recent trends.

2. Long term forecasting:

Long term forecasting is done for a period of 5 years or more. Such forecasting is done in fashion industry direction design, production. In this case, more attention is paid to political, economic and technology.

The Purpose of Fashion Forecasting:

- Fashion designers do long term and short term forecasting to maintain fashion in the market.
- Executives use forecasting for planning.
- Fashion forecasting techniques are used to assess competitors' market position, market share and develop competitive strategies.
- Production developers, managers prepare collections using trend forecasts of color, style direction.
- One of its main objectives is to innovate something new in the future from the past trend.

Steps of Developing Fashion Forecasting:

1. Past analysis should be done.
2. Research should be done on the fashion of the past.

3. Determining the reasons why past fashions changed. For example: finding out the reason why blue color is running even though red color is forecasted.
4. Determining how closely the forecast matches the past.
5. Researching how likely fashion will impact the future.
6. Applying fashion forecasting techniques.
7. Monitor regularly and check if it recedes.
8. And lastly revise again and again.

Design process

Design Inspiration

Before starting to design line designers need to decide on inspiration for the line, this could include studying pictures of design ideas from fashion tread sources, collecting swatches of interesting fabric textures and trims, developing some innovative design details.
During the planning stage, a theme for the line might be developed based on the inspiration chosen for the line. Theme helps to sell a group or a line to retailer or consumer. In some cases an advertising campaign may be developed around the chosen theme.

Plan a line

Planning an apparel line begins with research. Sales figures from the current selling season are taken in to consideration as the designers and merchandiser plan the upcoming line. An apparel company`s product type is the basis of the development of the new line as a line is developed with the product type as its foundation.
A line of apparel dose not consists of entirely new creation. In a new line, some styles will be carryovers, some styles will be modification of good sellers and some styles will be new designs.

Design sketch (with fabric and trim)

At design stage, the designer will begin to transform his inspiration into garment idea sketches with several options of fabric, colors and trims. Sketches can be made either manually or by computer. Designs can be made on body silhouette called croqui or flat sketch of garment called tech drawing can also be used for depicting the design.
The fabrics and trims are usually selected before a design is approved inclusion in a line. Each design idea sketch or tech drawing a small sample of the intended fabric called a swatch that is attached to the sketch or drawing.

Design selection

A good number of designs are created by a designer out of which only a few deigns are actually made into final garments. At a design review session, the designer presents the designs where the designs are discussed and evaluated. Suppose a designer presents 60 design ideas for review out of it only 30 to 40 sketches will be selected to continue into the design development stage. Some of these designs will be dropped at a later stage as well.

Deciding preliminary garment specification

The designer often has some specific design details in mind that need to be conveyed to the pattern maker and sample sewer in order to create the sample or prototype garment at the next stage of design process. These details, as well as other vital information, as conveyed

on the garment specification sheet, also called as spec sheet. Examples of these types of design details include the number of buttons, the size and types of buttons, any edge stitching or top stitching, the width of pleats or tucks, spacing between pleats or tucks, size of patch pocket, lining fabric, interfacing fabric etc.

Design development & Style selection-

After deciding preliminary garment specification like number of buttons, the size and types of buttons, any edge stitching or top stitching, the width of pleats or tucks, spacing between pleats or tucks, size of patch pocket, lining fabric, interfacing fabric etc. the design is further developed and after finalizing of style with specification the preliminary design idea is draped on dress form using muslin or fashion fabric. After careful markings have been made, the fabric pieces of the draped design are removed from the dress form. The drape is than ready for Pattern making.

Making first pattern

The pattern maker may work with paper pattern or pattern might be created using computer aided design system.

Traditional pattern making:

From designer`s specification and sketch the pattern master begins pattern making process called flat pattern design. In this process existing pattern made of a heavy paper called tag board or hard board paper can be used as basic pattern (also called as block or sloper) to begin a new design by tracing pattern on brown paper and then making alteration as per requirement.

Pattern making using computer:

Many apparel companies use Pattern Design System (PDS); its functions are similar to that of manual pattern making process. The basic patterns (called as block or sloper) are stored in computer`s memory, to begin a new style basic pattern is pulled from computer memory and necessary changes are made in it according to the new design.

Cut & sew prototype (first sample)

After developing the first pattern, either manually or by computer, the prototype or first sample is developed on muslin. Then the complete pattern is delivered to sample sewing department with swatch of intended fabric and garment specification sheet. As the first sample is made, it is sent back to design department for evaluation.

Approve prototype fit or revise style or drop style

The assessment of how each garment fits is very important to designer, so a Fit Model is used to assess the fit, styling and overall look of the garment. When several prototypes are ready for assessment, a fit session is scheduled fit model. While the garment fit is a part of assessment, prototype`s overall style and garment details are also discussed, if any of these aspects need revision either the existing prototype will be redone or the pattern will be revised and a new prototype will be cut and sewn for assessment.

Initial cost estimation

Initial cost estimation for the style is based on several important components. The cost of the material is estimated based on the number of yards of fabric required to make the prototype including trims cost such as interfacing, elastic, zipper, thread, buttons etc.

Review line
Each style in the line is reviewed by the team to determine how well the style works in following areas
Cost
Production
Styling
Fit
Fabric/ Trim

Select styles for line.
At the end of the line review process some of the styles are eliminated and some changes may be required in a few styles. The line is developed to get a group of styles with a hope that all styles of line will sell well at market.

UNIT II: Pre-Production

Pre production process
Finalizing production pattern
A specialist called pattern engineer or production engineer may be part of the team that is responsible for preparing the pattern for production. The first pattern may need some minor changes to facilitate mass production and all markings on patterns are very important for production pattern.

Order production fabric and trims based on sales order
Once the sample is approved and sales order is received from the retailer and number of garments to be produced is finalized the company orders fabric from textile producer. Along with fabric trims and sundries are also ordered.

Finalizing garment spec and size spec sheet
Garment Spec (Specification) Sheet
At the time of delivering design, to design development team, a garment specification sheet accompanies the design. The spec sheet lists all fabrics, trims and important construction details, including placement of logo, label type and label placement, also color of top stitch thread.
Size Spec (Specification) Sheet
The actual measurement at specific locations of the specific location of the finished goods foe each of the size specified for the style will be listed on a size specification sheet or measurement chart. The size specification also include tolerance listed usually as +/- in inch.
Grade production pattern in to size range
Patterns initially are made in only one size. In order to produce clothing that fits various body types and sizes, the pattern pieces must be increased or decreased geometrically to create a complete range of sizes. The process of resizing the initial pattern is called "grading." Each company determines its own grade specifications for each size, and size specifications vary slightly from manufacturer to manufacturer.
Grading is the method used to increase or decrease the sample size production pattern to make up a complete size range. For example, the sample size 10 patterns must be made

larger to accommodate sizes 12, 14 and 16 and smaller for sizes 8 and 6. Each company sets predetermined grade specifications, or rules. For example, a missy manufacturer's grade rules might call for increments of one and a half inches in width and a quarter inch in length for each size.
Today most manufacturers grade pattern on CAD systems. The pattern maker guides a cursor around the edges of the sample pattern on a digitized table.

Marker Planning
Marker planning is process of placing patterns on the fabric in a way that the fabric utilization is maximum is known as marker making. Marker making is very important because raw material cost is from 50–60 % of the total cost in apparel industry. It means that if we can save 2 % of the fabric, we can increase 1 % profit margin. Once markers of each style are finalized, one can easily calculate the yield of fabric needed for production and in turn can order the fabric. To prepare an efficient marker, the width of the fabric to be spread in a lay as well as the number of pattern pieces to be included in the marker plan for all the required sizes should be known prior to it.

Requirements of marker planning

1. Pattern alignment in relation to the grain line of the fabric:
Pattern pieces normally carry a grain line when pattern pieces are paid down the piece of cloth, as is commonest with large pattern pieces, the grain line should be paralleled to the line of the warp in a woven fabric or the wales in a knitted fabric, where the pattern pieces are laid across the piece, the grain line should lie paralleled to the weft or course direction.

In bias cutting, which is often used in large pattern pieces as a part of garment styles in ladies dresses and lingerie, as well as in small pieces such as pocket facing and under-collar in men's wear as a requirement of satisfactory garment assembly, the grain lines will normally be at 450 to the warp. The designer or a pattern cutter may define a tolerance which allows the marker planner to swing the grain line a small amount from parallel.

If the marker planner lays down a pattern outside the stated rules for grain lines, then the finished garment will not hang and drape correctly when worn. This requirement to follow grain lines restricts the freedom the marker planner has in choosing how to lay the patterns in the marker.

2. Symmetry and asymmetry:
Many fabrics can be turned round (through 1800) and retain the sane appearance and these are designated "EITHER WAY" or "SYMMETRICAL". They require no special action on the part of the marker.
In this case, if a fabric is turned round (through 1800) it does not retain the same appearance, especially when the two opposite ways are sewn together. However, as long as the pattern pieces of an individual garments all lie in same direction, which direction they lie does not matter. Example of such fabrics are those with a nap or pile which is brushed in one direction and this presents surfaces which show different reflection of light, knitted fabrics where the loops of the wales always point in the same direction and the fabrics with

a surface design which does not run the same way when turned round but where either direction is acceptable.
3. The design characteristics of the finished garment:
For example, if a vertical stripe does not show a complete mirror image repeat, the right and left sides of garment may be designed to be mirror image of each other. In this case, a marker is planned which uses a half set of patterns and the required effect is created in the spreading of the fabric which places pairs of plies face to face.

Methods of marker planning

There are two different methods usually used for marker making in the apparel industry.
i. Manual method.
ii. Computerized method.
Manual method:
It is one of the oldest, traditional and typical method used for marker making in the garments industry. In these processes, all pattern pieces made by pattern maker manually and after that fabric needs to spread on cutting table then put all pattern pieces chronologically on the fabric layer. Then mark it with chalk, pencil or pen. After that, the cutter will cut the fabric by following chalk mark. Regret to say that production cost and lose percentage of fabric is always more than the computerized method but the output is nothing than expectation. This process needs more time, practice and experience but efficiency and accuracy are not satisfactory. Usually, small factories may follow this process considering high set up cost of modern computerized equipment. It is generally a slower method and never been copied as and when requires.
Two ways is preferable to do manual method:
A) Full-size Marker: Marker planning with the full-size pattern. Usually, it is made for production purpose. All the patterns are in full dimension to put on the fabric layer and then those patterns are marked with chalk by changing different directions to minimize fabric expenditure. Please set the marker paper carefully and congest it gently so that they do not put out of place.
B) Miniature type Marker: Marker planning with minimized pattern. Usually, it is made to plan or schedule and learns or study i.e. for planning and learning purposes. By this process, full sized patterns need to be reduced as much as possible to visualize a large pattern in miniature form.

Computerized method:
Usually, pattern maker is liable to design all garment pieces accurately then send it to marker man to make an electronic marker. Marker man amalgamates all clothing pieces and decorates efficiently to minimize fabric lose. Once marker is ready to work, it needs to be print out through a plotter machine. Then the marker paper can be placed on the fabric layer and use for fabric cutting. During marker making, fabric length and width, cutting table size must be taken into consideration to minimize the wastage. Computerized marker paper directly set up on fabric layer. Fabric needs to cut according to marking line.
Two ways is preferable for computerized marker:
a) Automatic marker making:
It is one of the easiest and efficient processes of marker making. Several integrated software's like GGT, Lectra, Gemini are useful to make a computerized marker. Just only need two minutes to make an automatic marker. The computer makes the marker itself

according to the command given by the operator. It is more competent and useful than interactive marker making method.
2. Interactive method:
It is another marker making process where marker man decorates all the pattern pieces directly by applying their merit. By this process, all the pattern pieces are placed at the top of the screen of a computer in the miniature form. Then marker man can drag and drape into the pre- determined place through mouse pointer. Interactive marker making method mainly used to make shading marker or if found any serious fault in fabric. But it has never been alternative than automatic marker as comparatively less efficient.

UNIT III: Production

Spreading

Fabric spreading means the smooth laying out of the fabric in superimposed layers (plies) of specified length. Knitted or woven fabrics are laid in one ply (single ply) or in several plies (multi lays) for simultaneous cutting in one operation. Fabrics are usually laid up manually.

The manual spreading process is suitable for small-scale production. Manual spreading may be used for all kind of fabrics, including those with complex structures and intricate patterns. In large-scale production, manual cutting is often used for working with intricately patterned and high-cut pile fabrics. When compared to automated spreading, the cost of technical equipment in manual spreading is low, but the productivity is poor. The fabric spreading process is carried out by one/two workers at each side of the spreading table who move the fabric ply to the beginning of a spread. The spreading process is repeated until the desired number of fabric plies are laid down.

Automated methods of fabric spreading have significantly increased the productivity of the spreading process, but have not altered its main work principles. Similar operations are performed in both the manual and the automated spreading processes.

Methods of Fabric Spreading:
Four methods of fabric spreading are available in garment industry:

1. Completely manual laying-up;
2. Electrically driven laying-up by spreading machines (Semi-automatic or fully automatic)
3. Manual laying-up aided by spreading and cutting off devices;
4. Manually driven, mechanized laying-up using carriages;

The piece goods are provided in rolled or lapped form and are spread open or folded. On the fold, markers are used for doubled lays while full markers serve for open lays. Piece good lays are either single lays (consisting of one fabric ply) or multi lays (formed by several plies).

Cutting

Objectives of cutting the fabric

The first stage in the manufacturing of garments is the cutting and for that pattern, making is the base. Cutting is separating of the garment into its components and in a general form, it is the production process of separating (sectioning, curving, severing) a spread into garment parts that are the precise size and shape of the pattern pieces on a marker. The cutting process may also involve transferring marks and notches from the garment parts to assist operators in sewing, chopping or sectioning a spread into blocks of pieces goods many precede precision cutting of individual patter shapes. This is done to allow for accurate matching of fabric design or easier manufacturing of a cutting knife.

Methods of cutting the fabric

In the garments industry, there are two available cutting methods, are-

1. Manual Method,
2. Computerized Method.

1. Manual Fabric Cutting Method:

Here cutting process is done by using a knife, scissors, drill, etc. The knife is placed in the head of the cutting machine. The manual method is the most used cutting method in the garments industry.

The manual cutting method can be done by using the following equipment:

- Round knife,
- Band Knife,
- Straight Knife,
- Scissor,
- Die-cutting,
- Drill.

2. Computerized Fabric Cutting Method:

In the modern clothing manufacturing industry, the computerized cutting method becomes so much popular day by day due to its higher production and less time-consuming efficiency. Here all programs are loaded into the computer and the computer performs all the activities which are loaded.

The computerized Cutting method can be done by using the following equipment:

- Straight knife cutting,
- Water jet cutting,
- Laser beam cutting,
- Plasma torch cutting.

Sewing

Sewing is the most important operation in the process of garments making or other similar product. Sewing means joining of different parts of garments with the use of needle and thread. Without needle and thread, we can also make garments by using alternative methods of joining like adhesive, welding etc. Generally there are two things involved in

sewing process, i. e. stitches and seams. Sewing is the most important among all the processes of garments joining. The main purpose of sewing is to produce seam.

Sewing can be defined as the craft of fastening or attaching objects using stitches made with a needle and thread. It is a term used to describe the process used in factories to mass-produce a wide range of garments and other goods that are created by joining different components together along the course of a structured process. Sewing is done by putting parts together and joining into a whole garment. The basic sewing parameters include:

- Stitches,
- Seams,
- A method of sewing.

Seam:
Seam is a line where two pieces of fabric are sewn together in a garment or other articles. A seam is basically a line of stitching. Seams are stitched on the seam line. The seam allowance is the distance between the seam line and the cut edge. The standard seam allowance is (1.5 cm) wide.

Properties of seam:

- Seam strength
- Elasticity
- Durability
- Security
- Comfort
- Special properties:
- Water proof
- Fire proof

Types of seam:
There are eight types of seam. They are-

- Class-1: Superimposed seam
- Class-2: Lapped seam
- Class-3: Bound seam
- Class-4: Flat seam
- Class-5: Decorative seam
- Class-6: Edge neatening
- Class-7
- Class-8

01) Class-1- Superimposed seam:
The seam of class-1 is called superimposed seam. This is the most common & mostly used seam for joining fabrics. In this seam, two plies of fabric are placed on one another perfectly & then the fabrics are sewn. The sewn edges of the fabrics remain in the same side.

Uses:
In side seams of shirts, trouser, children wear etc. Piped & French seam are used for decorative purposes.

02) Class-2- Lapped seam:
The seam of class-2 is called lapped seam. At least two plies of fabric is required to produce this type of seam. The two Sewn edges remain in two opposite sides of the sewing line/seam line.

Uses:
This class of seam is not mostly used for sewing garments. This seam is used in sewing jeans pants, lunges etc.

03) Class-3- Bound seam:
The seam of class-3 is called bound seam. For producing bound seam at least two plies of fabric are required. The edge of One ply of fabric is bounded by the other. Folder is used in sewing machine for producing bound seam.

Uses:
Used in sewing men's underwear, Guernsey, pants, sleeping suits etc.

04) Class-4- Flat seam:
The seam of class -4 is called flat seam where zigzag stitches are used by 2-needle sewing machine. In this seam two plies of fabric are placed side by side & then they are sewn together by zigzag stitching.

Uses:
This seam is widely used in under garments & in knitted items.

05) Class-6- Edge Neatening:
The seam of class-6- is called edge neatening which is used to holds the edge of the fabric such that the yarns of the fabric cannot open easily. All the over lock stitches are edge neatening class seam.

Uses:
To protect the fabric edge such that the warp yarn of the fabric cannot easily open.

06) Class-5- Decorative Seam:
The seam of class-5 is called decorative seam. This seam is used in order to decorative purpose. The fabric which we used that would be folded in several times and then according to the underside of the folded part of the fabric stitch can be produced.

Uses:
Curtains, Table cloths, Furniture wears, Decorative ladies wears etc.

Stitch:
Loop or loops of one or more threads when bounds with each other, either by interlacing, interloping, interloping or combination of those when sewing fabric, each unit of such configuration is called stitch.

Types of stitch:
About 70 types of stitches are found using and from these types 18 to 20 types of stitches are mostly used in garments industries. All types of stitches are classified into 6 classes. They are

1. Stitch class-100 : Chain stitch
2. Stitch class-200 : Hand stitch
3. Stitch class-300 : Lock stitch
4. Stitch class-400 : Multi thread chain stitch
5. Stitch class-500 : Over edge/Edge neatening chain stitch
6. Stitch class-600 : Covering chain stitch

1. Stitch class-100: Chain stitch:
Chain stitches are produced by one or more needle threads and are characterized by interloping. One needle thread is passed through the fabric, form needle loop and is secured by the next loop formed by the same thread. Thus stitches are produced. This type of stitches is much unsecured. In case of the break of any stitch, it unravels very easily. The most common type of stitch is stitch calss-100 is stitch type-101. As it is very unsecured it is used for basting operations which are temporary stitching operation for the positioning of collar, cuff and flaps etc.

Sketch:

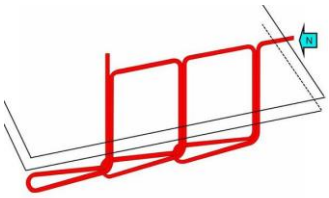
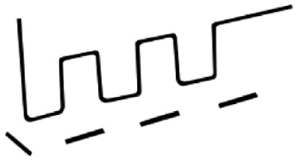


Fig: Stitch class-100 : Chain stitch (101)

2. Stitch class-200: Hand stitch:
This type is originated from hand stitches. It is produced from a single thread. This thread is passed through the fabric from one side to another and the stitch is secured by the single line of thread passing in and out of the garment. Hand stitching is a time consuming and costly operation which needs high skill for good appearance. Stitch type- 209 is used at the edges of jackets. For producing this stitch a special type of needle having at the middle and sewing machine is used. Normally this type of stitch is used in costly dresses.

Sketch:



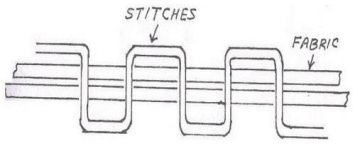


Fig: Stitch class-200: Hand stitch (209)

3. Stitch class-300: Lock stitch:
This type of stitches is produced with two or more groups of threads. Here the two threads are joined by interlacing. Loops of one group are passed through the material and are secured by the thread of second group. One group is referred as needle thread and other as bobbin thread. This stitch has enough strength and same appearance on both sides. Lock stitches are also very secured and don't unravels in case of yarn breakage. The disadvantage is bobbin contains less thread and so runs out during sewing. As a result the bobbin is again threaded after sometimes which time consuming and disgusting. Lock stitch is extensively used for joining fabrics collar, cuff, pocket, facing etc. Top stitching is used for button holing, attaching, blind stitching etc.

Sketch:

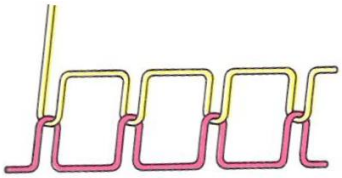


Fig: Stitch class-300 – Lock stitch (301)

4. Stitch class-400: Multi thread chain stitch:
This class is formed with two or more groups of threads. Loops of one group of thread are passed through the material and are secured by interlacing and interloping with loops of another group. Here on group is called needle thread and another group looper thread. The most common is stitch type-401 which is produced by one needle thread and one looper thread. It has an appearance of lock stitch on the top but has a double chain effect formed by a looper thread on the underside. Sometimes stitches in this class are called 'double lock stitch' because the needle thread is interconnected with two loops of the under thread. Here the possibility of seam pucker is very less. Again all threads are supplied from cone packages so there is no possibility of running out thread. This type of stitches is used foe sewing lace, braid and elastic. Stitch type-401 is used in jeans and trouser.

Sketch:

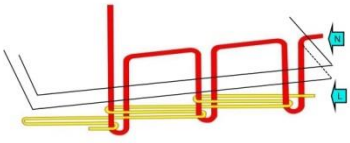


Fig: Stitch class-400: Multi thread chain stitch (401)

5. Stitch class-500: Over edge/Edge neatening chain stitch:
The stitch type in this class is formed with one or more groups of threads. Here at least one group of thread passes around the edge of material. So no thread from the fabric can come out. The most frequently used stitch of this type have one or two needle threads and one or two looper threads and thus forms a narrow band of stitching along the edge of the fabric. A

trimming knife of the machine ensures a neat edge prior to sewing. Stitch type-504 is formed of a needle thread and two looper threads. This class of stitch is used for edge neatening and for producing seam in knitted fabric. The extensibility of this stitch is very good. The width of this stitch is 3-5 mm. This stitch type can be used to make a decorative neated edge.

Sketch:

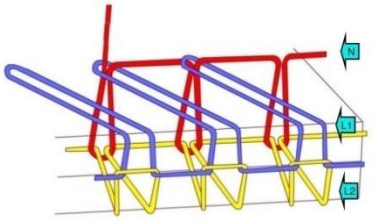


Fig: Stitch class-500: Over edge/Edge neatening chain stitch (504)

6. Stitch class-600: Covering chain stitch:

This type of stitches is generally produced with 3 groups of threads. Threads of two groups can be seen from either side. The first group of thread is called needle thread, second is called top cover thread and the third is called bottom cover thread. The stitches of this class are very complex and up to 9 threads can be used in producing these stitches. For producing stitch type-606, 4 needle threads and 5 other threads are required and it is called flat lock. Flat lock stitches are used in knitted fabrics especially in under wears. It is also used in decorating leisure wears. Stitch type-602 is used for attaching laces, braids and elastics in garments. Moreover it is used in decorative stitches and top stitching.

Sketch:

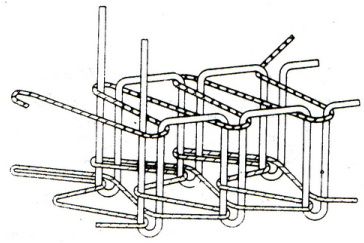


Fig: Stitch class-600: Covering chain stitch (605)

Sewing machine

A sewing machine is used to stitch the fabric and other pliable materials together with threads. Sewing machines were invented during the first Industrial Revolution to decrease the quantum of manual sewing done in garment industries. Since its invention, it has greatly improved the efficiency and productivity of the fabric, garment and needle industries. The different parts of a sewing machine and its functions help the Operator to know the functioning of a sewing machine. There are different types of sewing machine used in the manufacturing of garments and other articles, but here in this Unit, we will study only single needle lock stitch machine.

Types of sewing machine

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

1. Mechanical sewing machines
2. Electronic sewing machines
3. Computerised sewing machines

1. Mechanical sewing machines

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

Hand-operated sewing machine

(i) This is the simplest form of domestic sewing machine which is operated by hand.

(ii) A handle is attached to the flywheel which is detachable and is used to operate the machine.

(iii) A hand-operated sewing machine is generally used for domestic purpose for simple projects as it does not work very speedily.

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

Treadle sewing machine

(i) This machine is the same as a hand-operated sewing machine but it is operated by feet, with an additional stand attached to the machine.

(ii) A belt is attached to the lower stand passing through the balance wheel and driven by feet.

(iii) These machines run faster than the hand-operated sewing machine.

(iv) This machine is also suitable for the places where there is no electric supply.

(v) When handling the treadle sewing machine, both the hands of the Operator are free to handle the fabric. Hence, this speeds up the work of sewing.

2. Electronic sewing machine

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

(i) These sewing machines run faster than manually operated machines.

(ii) In the electronic machines, balance wheel comes to motion by a belt, which is attached to an electric motor.

(iii) A single motor is attached to the electronic sewing machines and this motor supplies power to the needle.

(iv) It is essential to control the speed of this machine by putting pressure on an electronic foot pedal.

(v) Practice is essential to handle an electric sewing machine.

3. Computerised sewing machines

(i) These sewing machines are very fast and specific to use.

(ii) These machines are similar to the electronic sewing machines. However, a computerised sewing machine works with the help of various softwares.

(iii) Computerised sewing machines allow the Operator to tailor the functions according to the sewing needs. A computerised sewing machine functions very appropriately in designing and stitching various components of the garment like sleeves, yokes, pockets, etc. These advanced computerised machines have an LED display or LCD display or touch screen. They are multi function machines and are expensive.

Types of sewing machine

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

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

Sewing machine: parts and their functions

The basic parts of a sewing machine are:

1. Spool pin is a metal rod placed on the top of the machine for correct positioning of the reel of thread.
2. Thread guide takes the thread from the spool pin to the needle through a small hole. It holds the thread in position from the spool to the needle. It smoothens the thread and protects it from abrasion.
3. Tension disc is a combination of two concave discs placed together with the convex sides facing. From spool pin, the thread passes through the thread guide, then between the tension discs to the needle. Tension discs control the delivery of the upper thread from the spool to the needle. The tension of the thread is adjusted by a spring and nut which decreases or increases the pressure.
4. Thread take-up lever is a lever fitted to the body of the arm located above the tension disc. It receives its up and down motion from the front axle. At the outside end of the lever, there is a small hole through which the thread passes. The take-up lever first loosens the top thread during the stitch formation, and then removes any slack to set or lock the stitch.
5. Needle bar is a metal rod to hold the needle at one end with the help of a clamp. Its main function is to give motion to the needle.
6. Presser foot is a detachable device for holding the material in place on the feed dog while stitching. This device is not used when attachments for tucks, ruffles or embroidery are used.
7. Presser foot lifter is the lever attached to the presser bar (located inside the face plate) to control the up and down movement of the presser foot. It must always be lifted up to take out the material from the machine.
8. Stitch regulator controls the length of the stitch.
9. Bobbin winder is a device which helps in winding the bobbin (located inside the slide plate) properly. The thread passes through it tightly or loosely, as desired.
10. Fly wheel (or balance wheel) is a round wheel located at the upper right of the sewing machine. This is made to revolve the machine. It controls the motion of the machine

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Sewing machine: attachments and their functions

Different machines have separate attachments for different sewing processes such as hemming, gathering, etc., but they operate differently on various makes of machines. The details of attachments are mostly given in the manual provided with the machine.

Some common sewing attachments are given here.

Blind hem foot It is an additional attachment basically used for edge finishing of various apparels like trousers and skirts, and home furnishing items like curtains, etc.

Braiding foot It allows lot of flexibility while attaching elastic cord, braid or cord.

Button fixing foot It can attach two-holed buttons and four-holed buttons to the material or garment. In this machine, the foot holds the button in place and then attaches the button to the fabric using zigzag stitch.

Buttonhole foot It is used for preparing precise buttonholes or binding the raw edges. These attachments are complicated to use on straight stitch machines. In such cases, it is advisable to hand sew the buttonholes. On a sewing machine, the buttonhole attachment produces a simple buttonhole stitch by swinging the needle from side to side. Insert the attachment by removing the presser foot and putting the buttonhole attachment in its place (Fig.1.19).

Circular sewing attachment It allows the operator to stitch in a circular pattern using straight stitch, zigzag stitch and any decorative stitches. Circles mostly up to 26 cm in diameter are stitched perfectly using this popular attachment, which is very essential for craft and decorative work. This is suitable for most top loading machines

Cording foot To attach decorative cords and threads, a cording foot is attached to the machine. This foot is designed for stitching closed to a raised edge. It is used for applying cord to the seam Decorative tape foot this attachment is used to fix trimmings and ribbons on the fabric

Gathering foot It is attached to create gathers on a fabric with high speed and precision to create perfect ruffles. This attachment gathers the fabric as it is stitched with fullness locked in every stitch

Zigzag foot It is attached to create designs in fabric using zigzag stitches of different widths

Hemmer foot it works on the sleek and small edges of fabrics as it automatically curls using either a straight stitch or decorative stitch at the hemlines. It works for hems which are too small to do by hand. It is best suitable for light weight fabrics. Hemmers make hems from three-sixteenths of an inch to seven-eighths of an inch wide, right on the machine. This attachment means hours saved from hand turning and basting. The hem is turned by the hemmer, and at the same time the line of stitching is guided close to the edge of the hem

Overcasting foot It delivers an accurate and consistent overcasting stitch where the thread is locked around the edge of the fabric and aligned with it to prevent the fabric from raveling.

Ruffling foot It easily makes and attaches ruffles on different types of fabric and finishes the fabric edges. This attachment is capable of taking gathered or pleated frills, and will take and apply frills to another section at the same time. It is useful in making children’s clothes and curtains. It is one of the most important attachments of sewing machine, and reflects a great deal of credit upon the inventors of these remarkable time-and-money-saving bits of steel. The method of using this attachment varies with different machines

Zipper foot It is the footer used for attaching mainly zips and snap tape. Zipper foot has a narrow toe foot which gives more precision and visibility. The foot needs to be adjusted to right or left to stitch both sides of the zip. This foot also attaches decorative cording and piping. There are two kinds of zip foot attachment: one with an adjustable foot, the other with a non-adjustable foot

Elastic foot It helps in attaching elastic to the fabric and provides even tension every time to avoid pulling and tugging on the needle

Embroidery foot It is suitable for shirring fabric. Its design allows the elastic thread to pass easily under the presser foot. On sewing machines, the elastic is couched onto the fabric. The thread is fed through the presser foot hole and pulled gently. The more it is pulled, the more the fabric gathers. On a straight stitch machine, the elastic is wound around the bobbin

Overlock foot It is useful for producing a durable finish on seams which fray easily or are bulky. It is suitable for use on a sewing machine and is most effective when the fabric is positioned under the presser foot so that the stitches form slightly over the fabric edge. A metal bar holds the edge in place to make sure that the stitches are set correctly. Test that you have the correct positioning and stitch width before you start to sew. It can be attached to the sewing machine.

UNIT IV: Accessories & Trims

Use of components and trims

The materials or components except the main fabric used in the garments are called trims. Besides the main fabric, various additional things are used for making the garments.

Labels

Labels don't play functional role but give basic ideas about the garment products to customers like size, fiber composition, brand name, care instructions etc. There are different types of garment labels like brand label, size label, care label etc.

Motifs

The special component which is attached outside of the garment for decorative purpose called motif. Company name, trade mark or other symbols can be written on the motif.

Lining

Lining is one type of fabric which is used inside the garment. Lining may be woven or knitted fabric. Generally, smooth and lustrous fabrics are used as lining. Linings are joined by sewing with the main body fabric. Lining is mainly used to give comfort to wearer. If you talk about outerwear, then you can't think about it without lining.

Interlining

Interlining is a textile material which is used between two layers of fabric in garment. It is basically used between shell fabric and lining. Interlining is used as reinforcement in the garment. It also controls the shape of the garment. It improves the clothing performance. So interlining is necessary for every garment.

Wadding

Various types of filling materials are made in different thickness and in the form of sheets, in non-woven method, from synthetic fibers, which are called wadding or batting. Wadding is used in those garments where the garment should possess the worm quality but the weight of the garments should not be high. There are a number of advantages in use of wading,

such as, it can easily be washed and dried, thickness is high but the weight is very light, the price is also comparatively very cheap.

Lace braid

Lace is a sensual fabric made from yarn or thread in an arbitrary web like pattern by manually or by machine. Originally silver, gold, silk or linen threads were used but now a day cotton thread is mostly used. Synthetic fiber lace is also available.

Elastic

Elastic was a great invention for the clothing industry. Elastic makes the garments more comfortable to the wearers. Elastic is a necessary trim for undergarments. It is made of rubber or elastic cores that are wrapped in polyester, nylon or cotton fiber and then knitted, woven or braided. There are different types of elastic like braided elastic, knitted elastic, woven elastic, lingerie elastic etc.

Hook-loop fastening

Hook and Loop fastener is a trim made of two thin plastic strip sheets one covered with tiny flexible hook and another with loops, which cling together when pressed together and can be separated when pulled out. Hook and loop fastener is a kind of trim that you will get fun when pressed together or pulling out. It also saves our valuable times. You can find different types of hook and loop fasteners in the market like woven, knitted, non-woven or high-tech hooks (HTH).

Seam binding

Seam binding is a type of trim or ribbon that is used to finish the raw edges of a garment or piece of fabric. It is typically made from cotton or a similar type of fabric, and it is used to give the finished project a clean and polished look.

Tape

Tape is a woven fabric trim which construction is like herring bone twill. Twill tape can be made from both natural fibers like cotton, linen etc. and synthetic fibers like polyester. Twill tape is used in sewing seams to give reinforcement.

Eyelets

Eyelet or Grommet is a two part piece of hardware made from metal or other material that are pressed together to hold or reinforce the pre-punched hole in a garment. It allows draw cords to go through. It is a necessary trim for hoodie items.

Zip fasteners

Zipper is a slide fastener consisting of interlocking elements each attached to one of the opposing edges of two tapes and a movable part called a ‘slider’ that spans the interlocking elements, which when moved in one direction causes the elements as one tape to interlock with the elements on the other tape and when moved in the opposite direction causes the elements to disengage. There are mainly two types of zipper: concealed zipper and continuous zipper. Zipper plays an important role as clothing accessory

Buttons

A small disk or knob sewn onto a garment, used for decoration or to fasten the garment by being pushed through a hole made for the specific purpose. Button is the most popular among the fasteners. Generally, it is made of plastic but other materials like metal or wood are also used. You may choose different types of buttons for your clothing like plastic button, metal button, wooden button, fabric button, toggle button etc.

Rivets

Rivets are not used to open or close the opening parts of garments.

They are used for following purposes:

1. Widely used for decorative and reinforcement (support) purposes of Denim or Jeans garments.
2. It has two parts and requires an appropriate device to attach on garments

Alternative methods of joining materials

The dominant process in the assembly of garments is sewing. Many attempts have been developed to replace sewing but the required speed, flexibility, appearance and performance which can be achieved only with sewing. So the alternative methods of fabric joining have their uses confined to some limited situations.

Some mention-able alternative methods of fabric joining are:

1. Fusing
2. Welding
3. Adhesives
4. Molding

Fusing-

Fusing is the most widely used process among the different alternative methods of fabric joining. Sewn interlining process is totally replaced by fusing process. The resin or polymer coated interlining is first placed underside the main fabric. Then heat and pressure is applied to join them properly. By applying heat, the resin melts and then the pressure is applied which adheres (sticks) the interlining with the main fabric. After joining, it is cooled so the resin materials become hard and binds the interlining with the main fabric strongly. Only interlining fabric is joined by fusing process.

Advantages of fusing

1. In most cases, the use of fusible interlinings shortens manufacturing time with a consequent reduction in direct labor cost.
2. There is a reduction in the skill required in many operators involving fusing compared with the sewing in of interlinings and this leads to a reduction in training time.
3. It is easier to achieve consistent quality in the lamination process than it is with many of operations of sewing in of interlinings.
4. Fusible interlinings provide opportunities for alternative methods of garment construction.

Requirement of fusing

- The laminate produced by fusing should show the aesthetic qualities required by the designer in the finished garment.
- The strength of the bond of the laminate must be sufficient to withstand handling during subsequent operations in the garment manufacturing process as well as the flexing which takes place in wear.

- Fusing must take place without either strike-through or strike back occurring. When the softened adhesive resin is pressed into the garment fabric, it is important that it does not go right through to the face side of that fabric, and that it does not go back to the outside of the interlining base cloth.
- The fusing process must not cause thermal shrinkage in the outer fabric. Fusing commonly takes place at around 150oc and at this temperature many fabrics may subject to thermal shrinkage.
- A further possible effect of the heat of the fusing process is that of dye sublimation.Fabrics may change color to a level which is unacceptable and in a way which causes a miss-match between the fused and unfused parts of the garment.
- Since the fusing process involves pressure, there is a risk that pile fabrics may be subject to crushing during fusing.
- Where showerproof fabrics are fused, there is a possibility that the presence of a fused interlining in the garment may wick water through the fabric in the fused areas while the unfused areas remain satisfactorily shower proof. Water resistant interlinings have been developed for these situations.

Process of fusing
Fusing is controlled by four processing components:

- Temperature

  There is a limited range of temperatures that are effective for each type of resin. Too high a temperature causes the resin to become too viscous, which could result in the resin being forced through to the right side of the cloth

- Time

  Time is the only time element of any value during the fusing process is when the top cloth and fusible are under pressure in the heating zone of the machine.This time cycle for a particular fusible is determined by :

  - Whether the fusible has a high –or low melt resin.
  - If a high or heavy substrate is being used.
  - The nature of the top cloth being used, thick or thin, dense or open.
- Pressure

  When the resin is viscous, the pressure is applied to the top cloth and fusible assembly to ensure that :

  - Full contact is made between the top cloth and fusible.
  - Heat transfer is at the optimum level.
  - There is an even penetration of the viscous resin into the fibers of the top cloth.
- Cooling

Enforced cooling is used so that the fused assemblies can be handled immediately after fusing. Cooling can be induced by various systems. Including water-cooled plates, compressed air circulation, and vacuum.

Equipments of fusing

There are various types of fusing types of equipment. Some of them are Specialized fusing presses, Flatbed fusing press, High-frequency fusing, Hand iron, Steam press, Continuous fusing systems.

There are various types of fusing types of equipment. Some of them are Specialized fusing presses, Flatbed fusing press, High-frequency fusing, Hand iron, Steam press, Continuous fusing systems

The equipment used for fusing can be divided into:

Flatbed fusing press

It consists of two horizontal metal plates between which the fabric and interlining laminate are sandwiched. In the simplest mode of operation, the operator places the garment part face down on the lower platen places, the interlining resin side down on the top of it in the correct position, and closes the press.

Continuous fusing systems

These systems operate by passing the garment part, with its interlining placed on it, past a heat source and, either simultaneously or subsequently, applying pressure.

Methods of fusing

Among the many types of fusing techniques that are used to apply the best tape to use on fabric, these are the most popular ones –

Reverse Fusing

- The fabric of the interlining Is spread on the fusing bed.
- The part consists of resin is directly upward
- Then the fabric of garments is spread on the resonated part of fabric & fusing is done
- This is called reverse fusing
- The volume of the interlining is shorter than the volume of the fabric of the garments because it is complicated to place the two components properly.
- Proper spreading is difficult in this fusing
- The machine in which heat is applied by the head is useful for reverse fusing
- Temperature is to be controlled with care
- Reverse fusing is used for applying the best fusible web for applique materials.

Sandwich Fusing

- In continuous fusing machines, the heat is applied from both sides of the fabric; this means from top to bottom.

- In this process, two interlining are placed between two fabric of garments
- Production can be increased but needs more time
- If the heat and pressure are not well controlled, then strike back may occur.
- Fusing may not be as expected

Double Fusing

- Two types of interlining are joined with the garment's fabric in a step during fusing.
- This type of interlining generally joined at the collar of the shirt &at the front part of the coat.
- Maintaining temperature, accurately cutting the fabric with any fabric cutting system, and setting of the part of the garments are very much essential

UNIT V: Finishing

Inspection-
Overview of Inspection
Inspection is the act of looking at something closely in order to learn more about it, to find problems, to see if rules are being followed and things are in their proper condition. Quality assurance process the bulk pollution is examined before delivery to the customer to see if it meets the specifications. The consumers want to get high quality products in low price. The products should reach the consumers with right quality depends on the cost. Quality assurance covers all the process within a company that contributes to the production of quality products. Which is conduct form beginning to end of the process (or) shipment? The inspection is carried out by representatives of the current production and the result record on control chart. Which is a process to Assure the product quality acceptable or not.

Stages of Inspection in Garment Industry
The aim of garment inspection is to visually inspect articles at random from a delivery in order to verify their general conformity and appearance with instruction/description and/or sample received.

There are different stages of inspection are done in garments industry following by inspectors as requirement of consumers:

A. Pre-Production Check (PPC)
B. Initial Production Check (IPC)
C. During Production Check (DuPRO)
D. Final Random Inspection (FRI)

A. Pre-Production Check (PPC):
This is done before production starts. Where then is a final verification of the material used; style, cut and workmanship of the garment or pre-production sample as per the customer requirements.

B. Initial Production Check (IPC):
This is done at the start of production where a first batch of garments is inspected; to distinguish possible discrepancies/variation and to allow for the necessary corrections to be made bulk production. The inspection is a preliminary stage covering mainly style and general appearance, workmanship, measurements, quality of fabrics, components, weight, color and/or printing.

C. During Production Check (DuPro):
This is done during production to ensure initial discrepancies/variations have been rectified. This inspection is in fact the follow -up of the initial production check and is generally carried out a few days after the initial inspection, especially if discrepancies have been detected at that time.

D. Final Random Inspection (FRI):
This is carried out when the production of the total quantity of an order or partial delivery is completed. A sample lot will be selected from the order and a percentage of the garments will be inspected, this percentage usually being stipulated by the buyer. The AQL sampling inspection may be applied or another inspection system designed by the buyer.

Pressing-
Pressing or ironing is the most important finishing process in the readymade garments sector which is done by subjecting a cloth to heat and pressure with or without steam to remove unwanted creases and to impart a flat appearance to the garments. Pressing or ironing is also done to introduce creases in the apparel. In the garments manufacturing industries, pressing is termed as ironing.

Purpose of Pressing,
1. Removal of unwanted creases and crinkles:
Various types of unwanted creases and crinkles arise during manufacturing the garments. These may be formed due to the washing of garments. Pressing or ironing is done here to remove those unwanted crinkles and creases from the garments
2. Shaping:
In the apparel dart and seam are used for proper shaping to the wearer. Pressing is done here to increase the beauty and attractiveness of the created shape by using dart and seam. In some cases, it needs to shrink or stretch of garments parts for shaping.
3. To apply creases where necessary:
In the garments manufacturing industry, pressing or ironing is done for applying a creasing effect in the apparel to increase the beauty. Also pressing or ironing is done before sewing the garments to increase the beauty and proper sewing.
4. Under pressing:
Before sewing the garments, some parts needed minimum pressing to sewing easily and beautifully which is called under pressing. In the readymade garments industry, under pressing is done for making coats, jackets, and trousers.

5. Final pressing:
After making the garments, pressing is done finally before folding which is called final pressing. Pressing or ironing is done here to increase the beauty of garments and to impart a flat appearance to the clothing.

Equipments of Pressing
There are several distinct types of ironing and pressing machines used in the garment industry, each tailored to specific tasks and requirements. Understanding these types is essential for garment manufacturers to select the appropriate equipment:

Steam Irons

Steam irons are among the most common types of ironing machines used in the garment industry. They utilize steam to remove wrinkles and creases efficiently. Steam irons come in various sizes and capacities, making them suitable for a range of production scales, from small workshops to large factories.

Steam Presses

Steam presses are larger and more powerful than steam irons. They are equipped with a larger pressing surface and higher steam output, making them ideal for bulk pressing tasks. Steam presses are often used in industrial garment factories to achieve consistent and professional results.

Vacuum Ironing Tables

Vacuum ironing tables are designed with a built-in vacuum system that creates suction, holding the fabric in place during the ironing process. This ensures that the fabric remains taut and flat, resulting in wrinkle-free and precise ironing. Vacuum ironing tables are commonly used in tailoring shops and small garment production units.

Shirt Pressing Machines

Shirt pressing machines are specialized for pressing shirts and blouses. They are equipped with shaped pressing bucks that mimic the shape of a shirt, allowing for efficient and precise pressing of collar, cuffs, and front panels. These machines are essential in garment factories specializing in formal and dress shirts.

Trouser Pressing Machines

Trouser pressing machines are designed for the efficient pressing of trousers and pants. They feature specialized bucks and forms that ensure creases are sharp, and the garment maintains its shape. These machines are crucial in achieving a polished appearance for trousers in the garment industry.

Fusing Machines

Fusing machines are used for fabric bonding using heat-activated adhesives. They are employed in garment manufacturing to attach interlinings, labels, and patches securely to

clothing items. Fusing machines ensure a strong and durable bond while maintaining the fabric's integrity.

Heat Transfer Presses

Heat transfer presses, also known as heat presses, are essential for applying graphics, logos, and designs onto clothing items. These machines use heat and pressure to transfer ink or other materials onto fabric, creating custom and branded apparel.

Automated Pressing Machines

Automated pressing machines are advanced equipment used in large-scale garment production. They are capable of automated pressing, ironing, and folding, significantly increasing efficiency and productivity in garment factories.

Packaging

Packing is one of the most important parts of the apparel manufacturing process. After completing the entire manufacturing task, apparel is required to pack. In the finishing section, packing is the last step before storing. Various types of packing are done and it depends on the type of apparel. After packing, it is placed in the carton as per instruction. After cartooning, the carton is stored in-store section. Then the carton is delivered from the store for export.

Different types of packing are done in the finishing section. The following are the most used packing types.

1. Stand up pack : Shirt (90^0 angle)
2. Flat pack : Sportswear/ shirt/ trouser
3. Hanger pack : Blazer, coats, pants etc
4. Semi stand up pack : Shirt
5. Half fold pack : Pant