DRAFT STUDY MATERIAL

SPECIALIZED SEWING MACHINE OPERATOR

(Qualification Pack: Ref. Id. AMH/Q2301)

Sector: Apparel, Made-ups & Home Furnishing

(Grade XI)

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Preface

Vocational Education is a dynamic and evolving field, and ensuring that every student has access to quality learning materials is of paramount importance. The journey of the PSS Central Institute of Vocational Education (PSSCIVE) toward producing comprehensive and inclusive study material is rigorous and time-consuming, requiring thorough research, expert consultation, and publication by the National Council of Educational Research and Training (NCERT). However, the absence of finalized study material should not impede the educational progress of our students. In response to this necessity, we present the draft study material, a provisional yet comprehensive guide, designed to bridge the gap between teaching and learning, until the official version of the study material is made available by the NCERT. The draft study material provides a structured and accessible set of materials for teachers and students to utilize in the interim period. The content is aligned with the prescribed curriculum to ensure that students remain on track with their learning objectives.

The contents of the modules are curated to provide continuity in education and maintain the momentum of teaching-learning in vocational education. It encompasses essential concepts and skills aligned with the curriculum and educational standards. We extend our gratitude to the academicians, vocational educators, subject matter experts, industry experts, academic consultants, and all other people who contributed their expertise and insights to the creation of the draft study material.

Teachers are encouraged to use the draft modules of the study material as a guide and supplement their teaching with additional resources and activities that cater to their students' unique learning styles and needs. Collaboration and feedback are vital; therefore, we welcome suggestions for improvement, especially by the teachers, in improving upon the content of the study material.

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Module 1 Production Technology

Module Overview

The fashion industry is evolving and demand of readymade garments is increasing, the need of mass production systems becomes the essential way to meet the market demand. Today the manufacturing units are very important as the tailoring shops are not able to produce the volume and supply across the world and giving livelihood to thousands of skilled workers. 'Garment production system is a way to convert a fabric into a garment in a manufacturing system. Garment Production systems are named as per the different factors, like-total number of tailors or operators involved, the machine layout, the total number of machines used to construct a garment, and movement of number of pieces in a line during construction process of a garment. The manufactured goods and policies of the company, the capability of manpower depends on the selection of top apparel production system. The commonly used production systems are discussed in this unit with their advantages and disadvantages.

Learning Outcomes
After Completing This Module, You Will Be Able To: • Explain different garment production systems • Identify garment operating procedure
Module Structure
Session 1: Different Garment Production systems
Session 2: Garment Operating procedure

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Session 1: Different Garment Production Systems

GARMENT PRODUCTION SYSTEMS

Garment production is a systematic way to convert a fabric into a garment. There are various methods of garments production. For example, if someone wants to make a shirt, he will go to a tailor that is individual/bespoken method, whereas for mass production we are depended on garment

industry. So there are various techniques available to convert a fabric into garment. The commonly used production systems are as follows:

1. Individual or Make through System:

It is the conventional technique of manufacture where an operator or single tailor who assembles the complete garment and is also known as bespoken method. The tailor in the tailoring shop performs all operations and makes a garment including sewing, hand work and pressing. The operator takes a bundle of cuttings to sew according to his method of work. The tailor in this system is highly skilled and resourceful. It is rare to find such skilled persons and hence this system of production is highly expensive. The individual system is most effective when a range of garments have to be constructed in small quantities such as in the sample room of a garment factory or the customized sewing is the preference.

Advantages

1. This system is more successful when a large series of garments have to be produced in particularly small quantities.
2. To finish more pieces, in order to earn more money in an individual system the operators will work with complete involvement.
3. The complicate operation can be performed by expert operators without any difficulties.
4. Due to one part of garment to one operator at a time, the Work in Progress (WIP) is decreased.

Disadvantages

1. The cost of labour is high as highly trained workers are used.
2. The operator is more worried on finishing the additional number of pieces rather than concentrating on the quality of work.
3. Productivity is a lesser in amount due to deficient in of ability.
4. In this system large quantity of identical style is not effective.

2. Group System:

It is also popular as Process System. In this system various components of garment are made in various places and assembled at different place. For example, an operator specializing in collar would assemble the collar by making the neck band, collar and join the collar to neck band and perform all operations essential to finish the part or component. Other group will perform another operation, thus various groups will make different parts of garment, and the last group will assemble these parts. The production division will have a number of subdivisions, each having experienced operators skilled of performing all the necessary operations for a precise

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garment component. The segments are built according to the average garment manufactured.

Advantages

1. Due to the use of special machines and all types of skilled labour, the output is higher compared to individual system
2. Semi-skilled, skilled, labours/ trainee can be utilized in this system, so the cost of labours reduced.
3. This system is very effective for producing a wide range of styles in large quantities.
4. Automation and specialization can be done.

Disadvantages

1. The quality of garment should be firmly maintained, because the operators of all levels are engaged in the work.
2. The highly skilled operators have to execute easy operation within the section, even though production is high
3. Increase in the inventory cost due to group of people engaged in each section as more Work in Progress (WIP) required,
4. The quality and production can be affected as there are chances for mix up of shade variation, sizes, as there is no bundling in this system.
5. Work dependency will be high due to different places of work for e.g., if a group, who is making collar finish work do not on time, assemble group will be dependent and will not be able to complete their task.

This type of production system is designed for a chronological organization. Each operator is assigned only for one operation. Garment component shift from operator to operator. This system is extensively used in garment industries and is based on a coordinated flow of work through each stage of constructing a garment. Time-management is the most significant aspect of this system because the flow of work cannot be coordinated if there are significant discrepancies in the set times permitted for all the processes performed on the line.

For example, if one operation has a value of 1.25 minutes Standard Allowed Minute (SAM), then all the other operations in the line must have the same, or a very close, value. The manipulation required to balance the standard time for each operator can sometimes lead to irrational combinations of entire or part operations which do not always progress the competence of individual operators. The synchronic system by its very nature is inflexible and particularly susceptible to absenteeism and machine breakdowns. At all times extra workers and machines must be accessible to cover the gaps.

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This arrangement needs sufficient quantity of the similar type of garments to remain the line in constant process.

Advantages

1. A less amount of material handling time is required in this structure
2. Little space is needed for each operator

Disadvantages

1. Even a small product alteration cannot be accommodated.
2. Machine breakdown can be very critical and troublesome issue
3. Workplace engineering is not easy
4. The line is placed as per the slowest operation

Evaluation of Production Systems

Four most important factors, any production system has which make up the system processing are time, transportation or shipping time, temporary storage time and inspection time.

- Processing time is amount of total of operation time of all processes engaged in construction of a garment.
- Transportation time is the time taken to transport semi-finished or finished garments from one operation/machine to another or from one department to another.
- Temporary storage time is a time for the duration of which the garment/bundle waits for completion of specific garment component.
- Inspection time is time in use for inspecting semi-finished garments for any faults during production or checking completely finished garments, before packing. The most significant aim of any manufacturing system is to obtain minimum production time.

Conclusion

The preference of top apparel production system will depend on the manufactured goods and policies of the company and on the manpower capacities, where changes in style are regular, it may be beneficial to use skilled worker, who can make entire garment and use one of the whole garment system. Due to less time consumption in, the sub-assembly system it is better than the progressive bundle system. The procedure time for a garment is same in both systems but sub-assembly system has temporary storage time or less waiting, machinery and space requirement, and labour costs are high for sub-assembly system.

It is the entire number of garments in the manufacture line which decides

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the selection of a production system relies on the price of the supply-in process; this depends on all garments being channelized at sewing machines, through inspection and in temporary storage between operations.

One of the aims of any manufacture system is to reduce total production time as least as possible. This repeatedly decreases inventory cost to a least amount. Sub-assembly system gives many opportunities to cut down on short-term storage and shipping time. The best system depends on manpower and manufacturing policies, garment style, specifications, machinery.

Activities

Activity 1: Prepare comparison chart of various production systems.

Material Required:

1. Chart sheet
2. Markers
3. Pencils
4. Ruler
5. Eraser

Step by Step Procedure:

1. Make three columns on a chart sheet and prepare the comparison chart of individual, group and line system.
2. Also write their advantages and disadvantages.
3. Discuss the sheet in class.
4. Place the chart in classroom or practical lab.

Check Your Progress

A. Fill in the Blanks:

1. _____production system is widely used in garment industry.
2. Bespoken method is used by _____
3. Group System is followed in industry where _____ numbers of Tailors/Operators work to make garments.

B. Questions:

1. Explain briefly line systems.
2. Explains differentiation between individual and group system.
3. Write down advantages and disadvantages of various production systems.

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Session 2: Garment Operating Procedure

Spec sheets are developed in computer by using spec sheet template or tech pack developing software. A spec sheet is a significant tool for designer/tailor/technician. Tailor takes measurements and note down in serial in his notebook, based on these measurements he/she develops garment, when Garment manufacturer usually get space sheet from buyers in soft copy.

Students should learn about the specification sheet and its contents clearly before starting garment operating procedure.

Spec sheet is part of apparel tech pack. It is the guidelines for sample creators and design idea by the product designer.

After sample development the sample fitting on the dress-form or live model verified. Below is example of spec sheet for student's understanding.

After receiving the specification sheet, pattern master prepares the pattern and check its fit by developing samples. As soon as the sample is approved by buyer/customer, bulk cutting and production is started as per below given process flow charts. Process flow chart explain you various garment operating steps.

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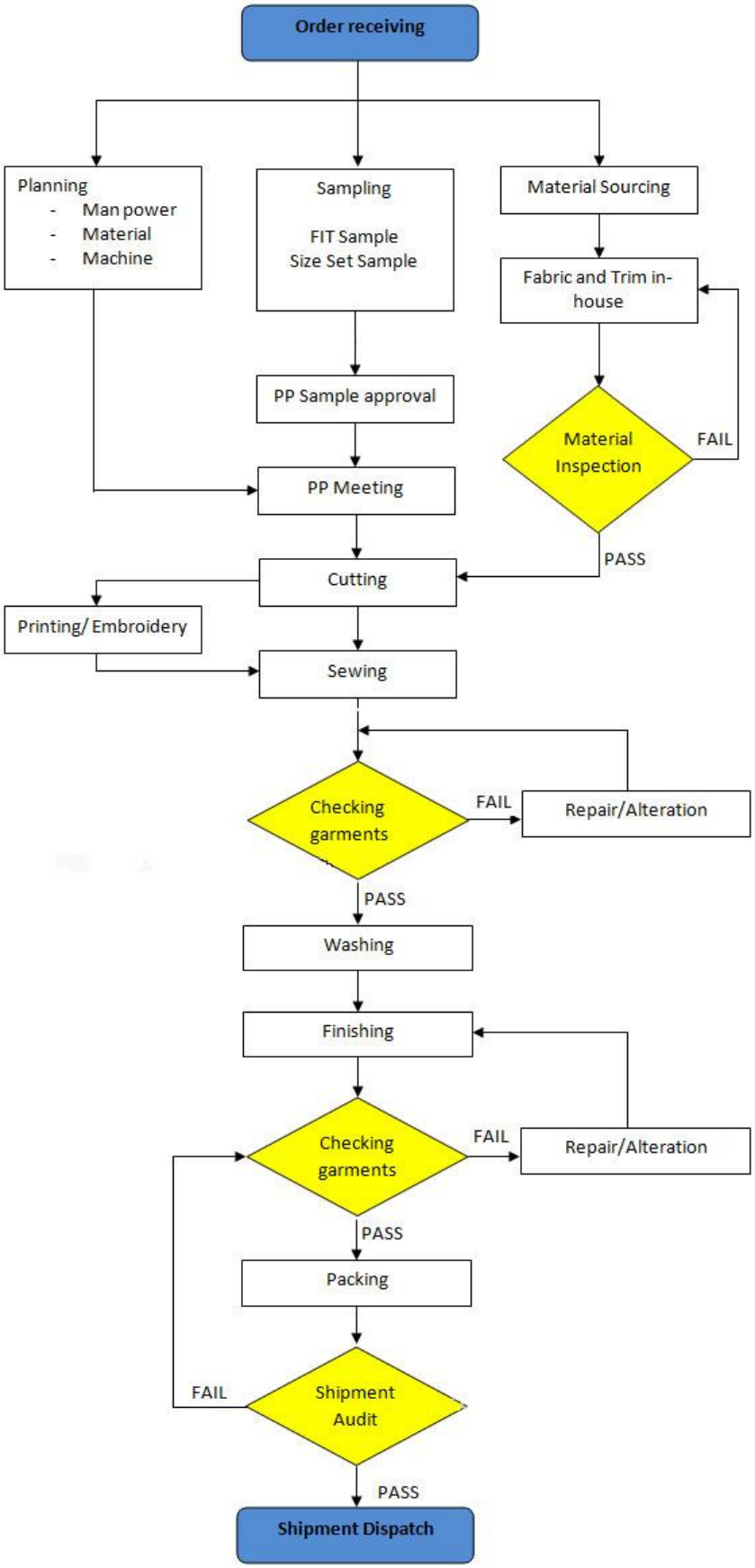
NEED OF PROCESS FLOW CHART TO PREPARE A GARMENT

The entire garment has to face a number of procedures from its receiving order to shipment. To finish an order without difficulty a process flow chart is required during garment manufacturing, it helps to know, and that how the raw materials are changed into the wearable garments in a garment manufacturing process.

For different departments of a garment manufacturing unit, different flow charts are prepared to define the processes of a particular section, like cutting processes flow chart, sewing processes chart, finishing process chart, etc.



Garment manufacturing process flow chart (major processes)

SEQUENCE OF OPERATIONS IN GARMENT PRODUCTION -

Fabric inspection
↓
Layering
↓
Pattern marking
↓
Cutting
↓
Fusing
↓
Stickering and bundling
↓
Washing
↓
Ironing
↓
Finishing
↓
Packing
↓
Process flowchart

1. Shirt Process flow

Shirt is a popularly known men's wear garment. It is also worn by women. It has huge demand for foreign buyer. Therefore, apparel industry gets order of shirt in large quantities. For manufacturing a long sleeve shirt the given process flow chart is used:

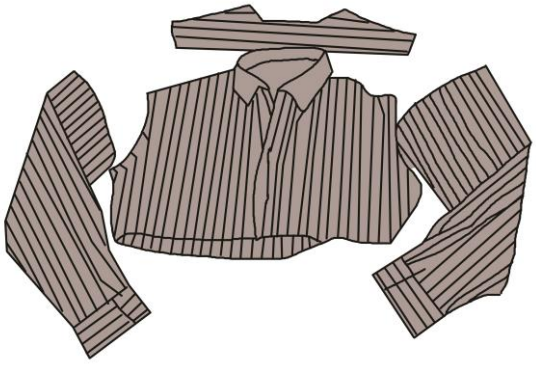


Fig.1.1: Components of a shirt

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Assembly Sequence of Long Sleeve Shirt

Collar preparation
↓
Cuff preparation
↓
Flap preparation
↓
Label attach with back yoke
↓
Box plate preparation
↓
Button plate preparation
↓
Back part pleat making
↓
Yoke join
↓
Pocket join
↓
Flap join
↓
Collar join
↓
Sleeve preparation
↓
Sleeve join
↓
Care label attaching
↓
Side seam join
↓
Cuff join
↓
Bottom hem making
↓
Button hole making
↓
Button attaching
↓
Finishing

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2. TROUSER:

Trouser is the most up-to-date and much known fashion of today's world. Most of the people of almost all the Indian states are now interested to wear trouser/ pants/jeans. Different types of trousers and pants are produced in the apparel industry. Various types of finishes are applied to the jeans /

pants/ trouser to boost its popularity. At any stage flaws in minute detail points can be the reason of rejection of the product. Because of this additional care is necessary to maintain at every stage of manufacturing of garment.

Sewing sequence of trouser/jeans is given below:

Number matching- Back and front of pant

↓

Back rise and front rise joint

↓

Pocket facing joint with pocket part by over-lock machine (M/C)

↓

Pocket part sewing by over-lock (M/C)

↓

Pocket tracing joint by plain (M/C)

↓

Top stitch pocket with pocket facing

↓

Top stitch with Zigzag (pocket rolling)

↓

Pocket marking

↓

Match the number of pocket with pant body part

↓

Tuck pocket to end side of the pocket

↓

Join pocket with body part

↓

Pocket top seam (Zigzag)

↓

Match number of back and front part

↓

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Side sew the trouser

↓

Side top stitch (Zigzag)

↓

Inside sewing by over-lock machine

↓

Elastic tuck for waist belt

↓

Sew eyelet at middle point of the belt

↓

Rib tucks sewing for belt

↓

Cutting elastic size wise

↓

Elastic + Rib Belt tuck

↓

Fusing of belt at front

↓

Belt and body joint

↓

Brand Label joint

↓

Top seam at belt joining point

↓

Bottom hem sewing

↓

Draw cord cutting and fielding

↓

Tucking draw cord

↓

Supporting tuck on bottom hem and belt top seam

↓

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Pocket eyelet snap button machine

↓

Inspection

All garment manufacturing units use these process charts while preparing the garments.

Activities

Activity 1: Prepare flow chart of any upper garment other than shirt.

Material Required:

1. Chart sheet
2. Markers
3. Pencils
4. Ruler
5. Eraser

Step by Step Procedure:

1. Browse internet/ visit industry and find out flow charts of different upper garment like t-shirts/kurta/jacket.
2. Select any one garment.
3. Understand its operation procedure.
4. Prepare flow chart.
5. Place the chart in classroom or practical lab.

Activity 2: Prepare a small dictionary (20 words) terms related to garment operating procedure.

Material Required:

1. A3 chart sheet
2. Pen/Pencils
3. Ruler
4. Eraser
5. Scissors

Step by Step Procedure:

1. To prepare a small dictionary cut the chart sheet
2. Identify 20 words for dictionary terms related to garment operating process.
3. Write words in dictionary and the meaning of the word.

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Check Your Progress

A. Find the words in given maze: Label, pattern, fusing, design, tailor, eyelet, tech-pack, cord, template, dress-form, product, flowchart, cuff, spec-sheet, boost, apparel

T	T	E	L	P	M	A	S	F	L
A	E	A	A	R	C	J	P	U	A
I	C	M	O	Z	U	M	E	S	B
L	H	D	P	F	F	J	C	I	E
O	P	R	R	L	F	F	S	N	L
R	A	E	O	O	A	I	H	G	P
E	C	S	D	W	P	T	E	D	A
Y	K	S	U	C	P	B	E	E	T
E	C	F	C	H	A	O	T	S	T
L	O	O	T	A	R	O	B	I	E
E	R	R	K	R	E	S	V	G	R
T	D	M	B	T	L	T	B	N	N

B. Write down the correct sequence of steps followed to make a trouser/pant:

1. Bottom hemming
2. Pocket Finishing
3. Belt attachment
4. Loop making and joining on belt
5. Crotch attaching-back
6. Front & Back side panel attaching
7. Zip attachment
8. Pocket making

C. Questions:

1. Explain need of process chart while making a garment
2. Write the importance of specification sheet to develop a garment.

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Module 2	Introduction to Industrial Sewing Machines

Module Overview

The objective of this unit gain understanding of the specialized sewing machines, its operating procedure and importance in Apparel, Made-Ups and Home furnishing sector. The sewing threads and sewing needles play an important role for the superior performance of stitches. An understanding of different type of sewing threads, sewing needles along with sizing system will be advantageous for the operators to perform well in the industry.

As the technology is heading fast, new high speed embroidery machines arrived in the market. The awareness about existing and new machineries will add more skills for the operator for their advancement in their career.

Learning Outcomes	
After Completing This Module, You Will Be Able To: • Identify types of thread, their classification and suitability as per machine and fabric • Identify needles for specialized machines	
Module Structure	
Session 1:	Types, Classification and Suitability of Threads as machine and fabric types
Session 2:	Needles for Specialized Machines

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Session 1: Types of Threads, Their Classification and Suitability as per the Machine and Fabric Type

DEFINITION AND USE OF SEWING THREAD

"Sewing threads are unique types of yarns that are made and designed in such a way that they go through a sewing machine quickly".

The essential function of a thread is to bring beauty and durability in stitches and seams. They are used for the purpose of sewing, embroidery,

quilting, upholstery and other technical applications. They form well-organized stitches without breaking during the functional life of the product.

PRODUCTION OF SEWING THREAD

Natural or Man-made fibres or blend of both are used for making sewing threads. They are prepared by twisting together two or more yarns and form a continuous length. Sewing threads are coated with wax to resist the strains involved in sewing. Sewing threads are available in various thicknesses and plies. Sewing thread colour is an important quality parameter. Most case dye to match (DTM) threads is used in garment stitching.

CLASSIFICATION OF SEWING THREADS BASED ON FIBRE TYPE

The knowledge of sewing thread classification is important. Properties of stitches depend on type of fibre. The natural fibre threads such as cotton, linen, silk and rayon (a manufactured fibre made from natural cellulose) gives beautiful stitches. Whereas the synthetic fibres like polyester, nylon, or acrylic are used for strength.

Classification of fibre

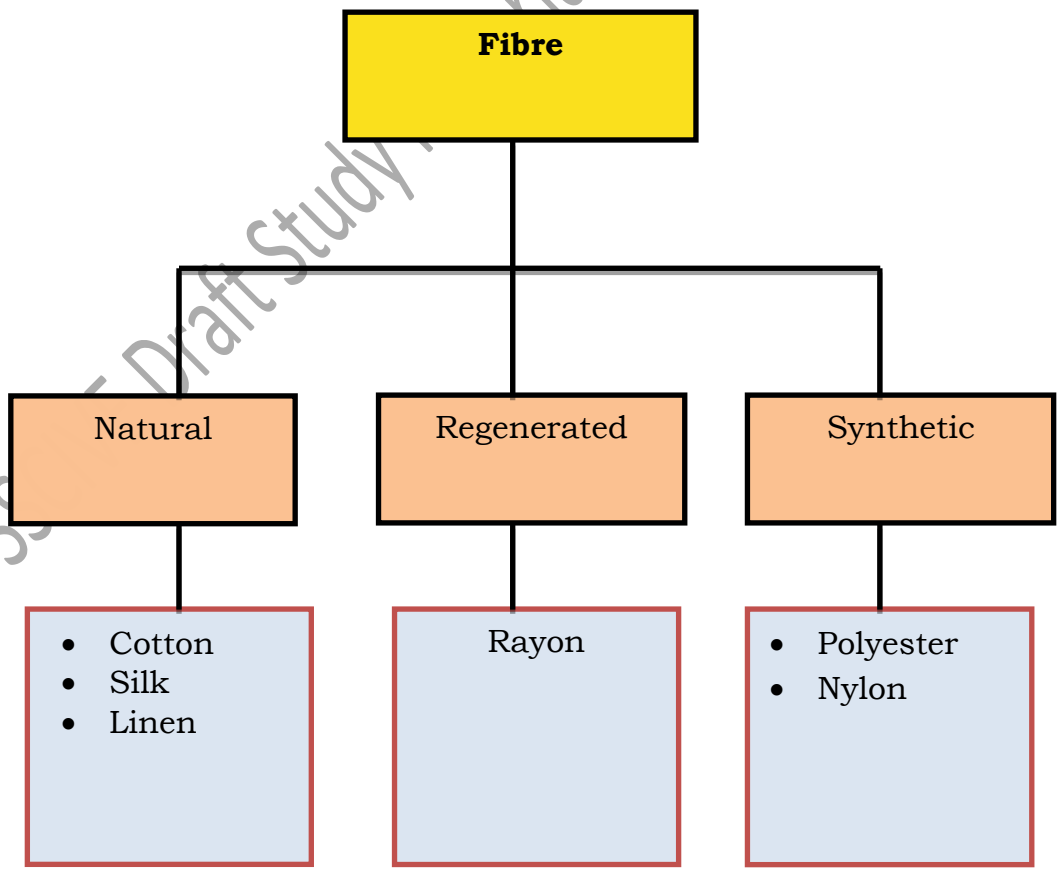

Table .2.1 Classification of sewing threads based on fibre type

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Thread Type	Raw material
Cotton	Cotton threads are made from a natural fibre, cotton, that is processed, twisted, spun, and dyed
Silk	Made from the cocoon of the silk worm. It is made from continuous filament and broken filament
Linen	Made from flax plant
Cotton-wrapped polyester thread	Prepared by covering a continuous polyester filament with staple cotton, this thread has the advantages of polyester and the feel of cotton
Rayon	Rayon is a blend of nature and manufacturing. It is referred to as viscose rayon, "a manufactured fibre composed of regenerated cellulose. Rayon is made from wood pulp
Polyester	Polyester threads are prepared from synthetic substances, extruded and twisted, spun, dyed.
Nylon	Made from hexamethylenediamine and adipic acid.

TERMINOLOGY RELATED TO SEWING THREADS

Fibres for sewing thread come in a variety of forms. Staple length fibres refer to fibres that either vary in length or contain filaments cut to a specific length during the manufacturing process. Continuous filament fibres on the other hand refer to synthetic fibres of unlimited length

- **Staple yarn**

It is produced from short-length fibres called staple. With the exception of silk, mostly the fibres that come from natural sources are staple fibres.

- **Continuous filaments**

Filaments are long lengths of nylon, rayon, polyester or silk as a single monofilament or as several strands in a multifilament. Filament cross-section can be a shape other than round. For instance, the trifocal filament has three sides which contributed to light reflection.

- **Twist**

Twist is the number of turns per inch in the thread. A thread with less number of twists will be weak or it unravels. Thread which is highly twisted can be reason for looping, snarling, knotting and stiffness. A good quality thread has a balanced twist and when threads go through a sewing machine chances are there that some additional twist may be added. During assembly of thread they are twisted either in right or left direction and are named according to the direction of the twist.

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- S-twist- when twist is inserted in right direction. Generally used for single strand yarn.
- Z-twist- when twist is inserted in left direction used for core & twisted multifilament. Most spooled threads make use of Z or left twist for optimal machine performance.

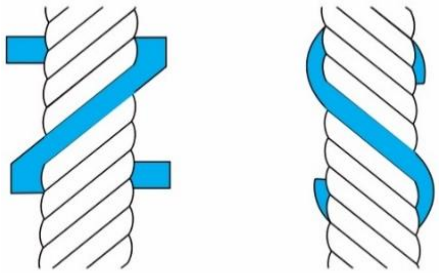

Fig.2.1: Direction of twist

CLASSIFICATION OF SEWING THREAD BASED ON MANUFACTURING

Spun:

Spun yarns are made from staple fibres that are united and twisted together to form simple, single yarns. For example, Cotton or polyester staple fibres are spun into single yarns and then twisted together.

Ply:

Ply is the number of single threads twisted together to make a sewing thread. Core and spun polyester threads mostly have two or three-ply construction.

Core:

It is a mixture of staple fibres and filaments. The most generally used core spun thread has multiple-ply structure; with each ply has a polyester filament core with cotton or polyester fibres enclosed around the core.

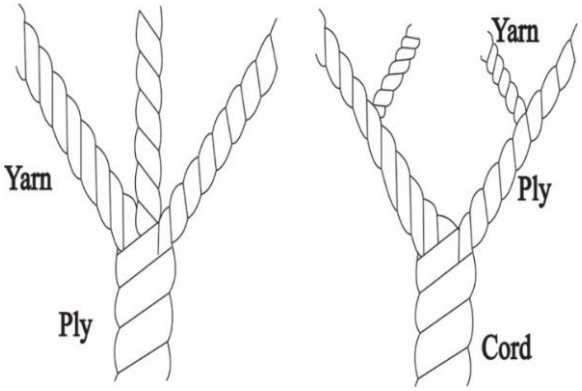

Fig.2.2: Ply and cord

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Textured:

Polyester or nylon yarns are mechanically textured to make the thread fuzzy and stretchy and woollies-like. Texturing is a process used to add to the size and the elasticity of a filament yarn. The most essential properties of textured yarns are fullness, softness, thermal insulation, a high degree of elasticity, and moisture-transporting properties and the elastic thread is used for stretchy fabric such as swimwear, active wear and more. It is used in upper and lower loops for rolled hems and edges.

CLASSIFICATION OF SEWING THREAD BASED ON FINISHING

The finishing on thread improves its suitability for various sewing uses after construction:

Bonded:

An added process is carried out on multifilament polyester and nylon threads. Bonded finish is, where a particular resin is included that forms a tough, protective smooth coating on the surface of the thread. It is done to reduce abrasion.

Gazed:

Cotton thread is passed at high speed through a flame to decrease the lint or fuzz and this process is known as gazing, it gives shine to thread.

Glazed:

In this process cotton threads are finished under controlled heat with starches and special chemicals and then it is polished for a high lustre.
The glazed procedure gives a hard finish that protects the thread from abrasion and improves ply security.

Mercerized:

Mercerization results in improving strength, lustre, and dye affinity, and reduces lint of the fabric. In this procedure cotton or cotton-covered polyester thread is treated under controlled tension in a caustic soda solution.

Soft:

Usually refers to a cotton thread to which no finishing processes have been applied. It is only dyed and lubricated.

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CLASSIFICATION OF SEWING THREAD ACCORDING TO THEIR USE

Elastic Thread

This is a very suitable thread which straight away gathers and elasticizes the fabric. This thread is hand winded on the bobbin. Shirring is done with this elastic thread in the bobbin.

Bobbin Thread

It is used as the underneath thread in a lock stitch machine. It is also called bottom thread in lock stitch machine or loop thread in chain stitch machine or over edge machine.

Topstitching thread, Buttonhole twist, or cordoned

These threads are found in cotton-covered polyester, silk, polyester and cotton. This is a heavy thick and strong polyester thread used for decorative machine-stitching, top stitching and heavy-duty stitching, hand-stitched buttonholes on heavy fabrics, and cording machine buttonholes.

Light-Sensitive Thread

These threads are used for topstitching and embroidering. They either shine in the dark or change colour in sunlight.

Fusible Threads

To outline pockets and appliqués, so they can be for the time being fused in place instead of temporary stitches. Melts when pressed, structuring a bond with fabric. They are used in the bobbin.

Water Soluble

Useful for positioning pockets, pleats, basting hem and etc.

Metallic Thread

It is used for embroidery and decorative stitching. Metallic thread is made from nylon, polyester and cotton. It's available in multiple colours of gold, silver, copper, pearl, ruby and emerald.

Serger Thread

It comes on tubes, it has a special finish for high-speed stitching, and it is better-quality than all-purpose thread.

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NUMBERING OF THREAD

There is no universal system for thread. However, an understanding of the three sizing systems used today is useful because it gives an idea of relative diameter within a thread type. On the "Thread size comparison chart" below, you can see that each system uses a different numeric convention to identify size.

Table 2.2.Numbering of threads

Thread Weight	Weight/Ply	Denier	Tex
Lightweight(fine) threads	50/2,60/2,70/2,80/2	100s,200s	10-24
Medium-weight threads	50/3,30/2	300s,400s	27-45
Heavyweight(thick)threads	40/3	500s up	50up

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Weight

Used for cotton and other spun threads- weight is expressed as the number of kilometres required of a specific thread required is weigh 1 keg. The higher the number the lighter and finer will be the thread.

A slash separates weight from plies

When thread is marked 60/2 it is a 60-weight, 2-ply thread. Generally, 2-ply threads are for machine-embroidery and 3-ply threads are all-purpose.

Denier

Denier is the 9,000-meterweight in grams of particular thread. The higher the number, the heavier and thicker is the thread. Used for man-made threads like polyester, rayon, and nylon.

Tex

Tex is the weight of 1,000 meter of a specific thread. The higher the number the heavier and thicker is the thread.

Suitable Threads for Fabrics

Table.2.3 Relation between thread & fabric

Thread	Characteristics	Suitable fabrics
100%Cotton thread	Stretch less, Smooth finish, Heat resistant, can safely press with hot iron and long-lasting	Light and medium weight cotton
Polyester	Strong, low cost, good washing fastness and satisfactory elastic properties	Knits as well as woven and Top stitching
Nylon	High extensibility, Strong and Semi-transparent.	Knit fabrics, extensible seam and swimming wear
All-Purpose	This is a thread consists of both properties of polyester and cotton. Polyester thread covered with cotton. It gives best quality of both threads	Both hand sewing and machine Sewing on woven and Knits
Silk thread	Fine shiny thread which can be used for embroidery	Expensive and used on delicate garments
Rayon thread	Strength and stability are less but makes the thread brighter	Limited use on sewing but generally used in embroidery
Linen	High strength	Used on canvas and course fabric

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Suitable Threads for Machines

Table 2.4 Relation between machine and threads

S. No.	Machine	Thread	Use
1.	Single Needle Lock Stitch	Cotton, Silk, Wool, Nylon	Run stitch and Attaches
2.	Double Needle Lock Stitch	Cotton, Silk, Wool, Nylon	All type of Top stitch
3.	Over lock	Filament, 2,3 ply	Serge edge with cover stitches
4.	Flat lock	Filament, 2,3 ply	Hemming, cover stitch and Top stitch
5.	Feed of Arm	Cotton and ply of yarns	Side seam with Chain stitch making

Activities

Activity 1: Prepare a practical file by pasting the various sewing thread samples.

Materials Required:

1. Practical file,
2. Sewing thread,
3. Glue, Scissors.

Step by Step Procedure:

1. Collect various sewing threads from the market.
2. Classify the collected sewing threads based on the type of fibre used, length of fibre used, type of twist used and type of finish given.
3. Prepare a file by pasting the sewing thread samples.
4. Label them.

Activity 2: Prepare a chart of suitable threads for fabrics and machines.

Materials Required:

1. A3 Chart Sheet
2. Pen/Pencil
3. Ruler

Step by Step Procedure:

1. Prepare a chart sheet of suitable threads for fabrics and machines.
2. Place the chart in your classroom or practical lab.

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Check Your Progress

A. Fill in the blanks:

1. _____ _____ lock stitch machine is used for all types of top stitching.
2. Flat lock machine is used for _____ purpose.
3. _____ is the weight in grams of 1000 meters of industrial thread.
4. Denier is the weight in grams of _____ meters of a polyester thread.
5. 2- ply threads are mainly used for _____ _____.

B. Match the column:

Threads		**Raw material**	
1.	Linen	a)	Hexamethylenediamine and adipic acid
2.	Cotton	b)	Flax plant
3.	Nylon	c)	Natural fibre
4.	Silk	d)	Regenerated cellulose
5.	Rayon	e)	Continuous filament

C. Questions:

1. Classify sewing thread based on fibre type, construction, finishing and use.
2. Explain the selection of thread as per the type of specialized machine.
3. Explain numbering of thread.

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Session 2: Needles for Specialized Machines

Sewing Machine Needle

A needle is a little, very thin piece of metal which is used for sewing. It has a pointed edge at one end and an eye in the other end for a thread to pass through. A needle used in stitching to draw thread through cloth. The main trait of any sewing machine is the needle. The needle type and size is an essential contributor to the way the needle works. Choosing the right needle is one of the important tasks. Using the incorrect type of needle will damage the fabric by pulling threads in the fabric, leave holes in seam allowance, and break in the centre of the seam and poor stitch quality.

Parts of a Needle

The parts of needle are given below:

Butt: The top shaped end which help spacing into the needle bar/clamp.

hank: The shank is the upper portion of the needle that is placed into the machine. The back side is flat and the front side is rounded.

Shoulder: The middle section between the shank and the blade.

Shaft: The size of needle is determined by the shaft thickness. The shaft is the top portion of the needle that begins at the bottom of the shank and lengthens to the point of the needle. The thickness of the needle depends on the body of shaft. A jeans needle has a heavy-duty shaft and microtex needle has a thin shaft.

Blade: Blade is progressively narrowed to tip. It is the longest part of the needle and highest friction occurs in this area with fabric

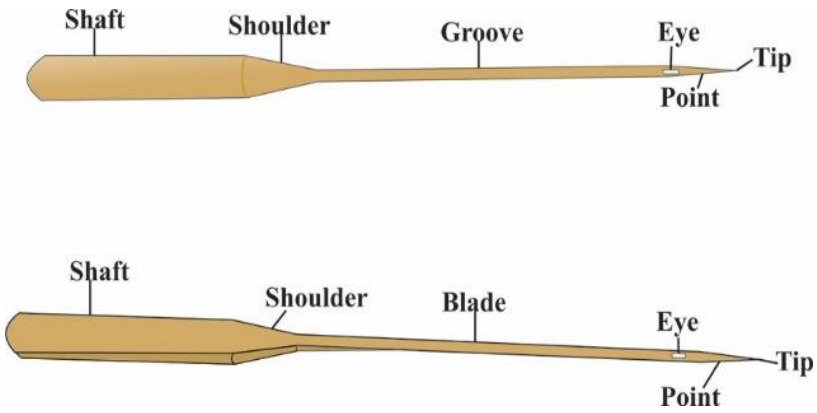

Fig.2.3 (a)

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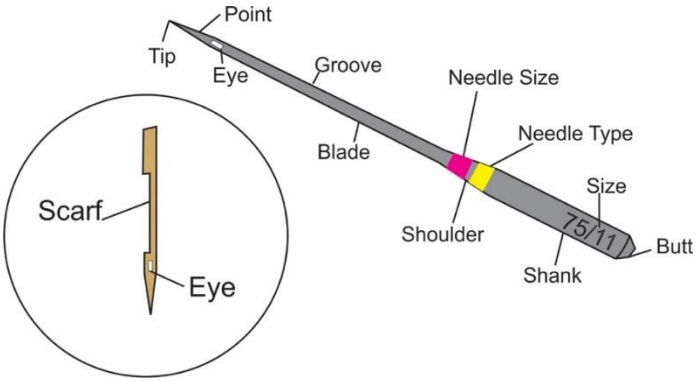

Fig.2.3 (b): Parts of a needle

Groove: This is the slit above the eye and it is the part that reduces friction and creates smooth stitches. It is found on the front of the shaft in home sewing needles and on the back of industrial needles. It becomes larger as the needle size increases.

Scarf: It is a part on the backside of the needle just on top of the eye. The scarf is a groove at one side of the needle. The place and shape and of the scarf add to the uniformity of stitching with a range of threads and fabrics. It allows the bobbin case hook to interconnect with the top spool thread and forms stitches.

Eye: The hole which is situated in the face of the needle is called eye through which thread passes through the needle. The size of the eye differs by needle type.

Point: Point is the sharp pointed tip part at the end of the needle. It aids to pierce the needle into fabric without ruining it. Different type of needle point is the major deciding reason while selecting needle to match the different type of fabrics. A jeans fabric needle will have a sharp point, whereas for a jersey fabric ballpoint needle is used which has a round point.

Tip: The end edge of needle is called tip. It aids to make hole in the fabric during stitching the apparel. The acute the tip shape, will define penetration performance.

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The point and tip

Vary with different needle types. Various shapes of points and sharpness of tips are used to stitch through a variety of materials.

Size of the Needle

The three important dimensions of the needle are the tip of the needle, the diameter of the blade, and the thickness of the shank.

Blade Diameter (The Size)

The "size" of a needle depends upon the thickness of the blade which is the middle area of the needle. Needle size have an effect on two things: how large a thread should be used and how large a hole is made in the fabric. Some needles have narrowed blades, other needles are widened around the eye, but rest of the part of the blade will have an even thickness and this is what gets measured for the size.

Needle System

The metric system and the singer system are the two systems usually used; both sizes are generally marked on needles so checking for the preferred size is simple. The European also called the "NM" system or "number metric" is considered regular fixed size and equivalent to the thickness of the needle. For example, an NM 100 needle is 1 millimetre in thickness, while a NM 50 needle is half a millimetre in thickness.

The American established and publicized by singer, which the Japanese industry also adopted, uses somewhat arbitrary numbers. In the smaller sizes, each consecutive size is close to 0.05 millimetres larger than the size previous to, but the increment is larger for the larger sizes.

The number refers to the diameter taken on the shaft right above the eye. The European metric sizing system for sewing machine needles is numbered from 60 to 120. The American sizing system is numbered from 8 to 19, the lower the number the finer the needle and the higher the number the larger the needle for both of the sizing systems, most sewing machine needles will have both numbers in its size description for e.g. 100/16 or 16/100).Most needle companies show both sizes on the package.

American	European
8	60
9	65
10	70
11	75
12	80
14	90
16	100
18	110
19	120

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Table 2.5Type of Needles

Type	Uses	Configuration
STANDARD NEEDLES		
Universal needle	Best needle choice for most fabrics.	Has small smoothed point and extended scarf to allow fool proof assembly of needle and bobbin hook.
Ballpoint	For heavier, sweater knits	Rounded points that go through between fabric threads
Stretch needles	Highly elastic fabrics, like Spandex, or Lycra.	Stretch-needle point is slightly less rounded than ballpoint
Microtex	Sewing microfiber, silk, synthetic leather, precisely stitching edges and heirloom sewing.	Has an acute point.
Sharp needles	Sewing microfiber, silk, synthetic leather, precisely stitching edges and heirloom sewing.	Has an acute point
Leather needle	Excellent for sewing natural leather	Has slight cutting point (almost like an arrowhead).
Denim (jeans) needle	For heavyweight denim, canvas, Furnishing, fabrics, artificial leather, andvinyl.	Acute point, has deeper scarf, and customized shaft to stitch without moving forward the fabric down into needle-plate hole. Goes through fabric and forms stitches
Handicap/Self-threading needle	Enables threading easier for sewers with blind people.	Universal needle with slip-in threading hole at the eye.
DECORATIVE NEEDLES		
Topstitching needle	Topstitching.	Has extra-sharp point, large eye, and groove for heavy thread.
Embroidery needle	Machine embroidering with decorative thread.	Has both neither sharp nor round point and large eye to keep decorative threads from breaking.
Metallic needle	Stitching with decorative metallic threads.	Has standard point; large, longer eye or hole to let fragile metallic and synthetic filament

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		threads to pass through smoothly.
Quilting (stippling) needle	Piecing, quilting, and stippling	Has special tapered shaft to prevent damaging fabrics when stitching multiple layers.
SPECIAL PURPOSE NEEDLES		
Hemstitch (wing) needle	Hemstitching embroidery on linen and batiste.	On the sides of shank have fins to create holes as you stitch.
Twin (double) needle	Topstitching, decorative stitching and pin tucking,	Two needles on single shaft produce two rows of stitches.
Triple needle	Same uses as for double needle	Cross bar on single shaft connects three needles comes with universal point in 2.5mm and 3mm widths to stitch three stitching rows.
Spring needle	Free-motion stitching with dropped feed dogs	Has wire spring above point to avoid fabrics from rising up onto needle, eliminating need for presser foot.

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How to choose Appropriate Machine Needle for the Fabric and Machine type:

Identifying the combination of fabric, needles and threads give the best results. Fabric, thread and needle must all work together toward the well stitched garments. That is why sampling is so important because using the wrong needle type and size can result in poor stitching.

- The type of needle should be selected according to the construction of the fabric.
- Determine the needle size based on the fabric weight.
- After selecting the needle size, match the needle point to the fabric
- The style of seam being constructed often requires a special needle such as for top stitching, in addition to the needle being used for general garment construction.

A needle system is a group of needles made to fit particular sewing machines. All needles in a system are of different diameters with same length and shank size. For lighter materials narrower or thinner needles of lower size numbers are used. Needle of thicker diameter indicate higher size numbers, used for heavier fabrics. Match the needle system and the size of the needle to your machine, then to the product you are stitching.

Selection of Thread type and Needle Size for Industrial Sewing Machines

Table 2.6 Relation between thread needed & sewing machines

Industrial Sewing Machines	Needle System	Size of the Needle	Uses	Threads
Single Needle Lock Stitch	DB	#09,#14,#18	Run Stitches, Top stitches &attaches	Cotton, Silk 2,3 ply yarn
Double Needle Lock Stitch	DP	#9,#10, #14, #21	Pointed & Top stitches of shoulder, arm hole patch pockets	Cotton, Silk 2,3 ply yarn
Over Lock	DC	#27	Edge serge, Sleeve attach, Side seam	Cotton & Polyester
Flat lock	UY 128 GAS	#9S,#10S #12S	Cover stitches, Bottom & Sleeve Hemming, and top stitch of the Neck area in knit wears	Cotton & Polyester
Button Sewing	DP	#11J, #14J	Sew the button hole on the garment	All type of thread
Feed of Arm	DP	#21, #14	Side seam finishing with chain stitch formation	All type of thread
Bar Tack	FL X118 GAS	#10S - #12S #08S - #11S	Bar tack	All type of thread

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Activities

Activity 1: Prepare a practical file by pasting the various needle samples

Materials Required:

1. Practical File
2. Needle
3. Glue.
4. Small locking polythene.

Step by Step Procedure:

1. Collect various sewing needles from apparel industries/market/concerned organisation.
2. Classify the collected needles based on its size and machine type to be used.
3. Put the needles in small locking polythene.
4. Prepare a file by pasting the needle samples based on the classification given.
5. Label them.

Check Your Progress

A. Match the columns:

1	Shaft	a)	Upper portion of the Needle
2	Tip	b)	Intermediate section between the shank and the blade
3	Butt	c)	Lower portion of the needle
4	Shank	d)	Shaped end which facilitates insertion of needle
5	Shoulder	e)	Ending edge of the needle

B. Questions:

1. Explain how to choose appropriate machine needle for different fabric and machine type?
2. Explain the parts of a needle with the help of a diagram.
3. Explain the types of needle system.

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Module 3 Machines for Seam Finishing

Module Overview

Along with the quantity of any product, quality places a very important role. In the mechanized world duplication is as fast as production. To remain in the market in the quality holds the key for success. It's not only the seam but seam finishing also is equally important. The objective of this unit is to equip the students with the knowledge of seam finishing and machines used for seam finishing. This unit deals with lock stitch and over lock stitch machine. After completing this unit, students will be able to utilize the seam finishing machines appropriately at required stages of manufacturing.

Learning Outcomes
After Completing This Module, You Will Be Able To: • Identify lock stitch machine used in apparel industry • Demonstrate the use of overlock machine
Module Structure
Session 1: Lock Stitch Machine
Session 2: Over-lock Machine

Session 1: Lock Stitch and Overlock Stitch Used in Apparel Industry and Their Uses

Industrial machines are designed for continuous use at high speeds, thousands of stitches per minute and long hours. These machines are more durable and the stitch quality is exceptional. Features are designed for making highly repetitive sewing tasks easier. All the components of an industrial machine are engineered for efficient garment construction, saving time and money. Industrial machines typically are customized for a single purpose, such as straight stitching, specialty seams, buttonholes, zipper application, and bias binding, and they might be specialized for different materials being used. Many times, these various applications use specially made presser feet to sew a specific task.

Various Specialized Sewing Machines Used in Apparel Industry.

1. Single Needle Lock Stitch Machine with Under Bed Trimmer (UBT)
2. Double Needle Lock Stitch Machine

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3. Over-lock Machine
4. Buttonhole Machine
5. Button sewing Machine
6. Belt & Loop attaching Machine
7. Flat lock Machine
8. Feed off Arm Machine
9. Bar-tacking Machine

1. Single Needle Lock Stitch Machine with Under Bed Trimmer (UBT)

This machine makes lock stitches which are formed with Single needle, Single thread and single bobbin thread. This is a commonly used sewing machine, which is available in a large variety & versions from basic to computer controlled.

To join two or many fabric plies a single needle lock stitch machine is used. It is used to stitch light, medium & heavy materials.

FIG.3.1: Single needle lock stitch machine

UBT- Stands for Under Bed Trimmer. Now the majority of the single needle lock stitch sewing machines are with UBT function. Sewing operator need to use scissor to cut thread of the needle and bobbin after completed the stitch in normal lock stitch machine. But with UBT functions, operator requires to push a button.

2. Double Needle Lock Stitch Machine

Double and single needle lock stitch machines function on the similar principles. In this by using two needles and two bobbins, two parallel rows of lock stitch are formed. It is used to sew pointed or top stitch of the back yoke, pocket, sleeve and shoulder etc.

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Fig.3.2: Double needle lock stitch machine

3. Over-Lock Machine

Its primary function is to trim excess fabric and over lock the edges. It gives the apparel a professional appearance.

- It is available in three thread, four thread, five thread and six thread
- This machine is suitable for woven and knits but mainly used to sew knits garments.
- It is used to attach sleeve, side seam, neck rib etc.

Fig.3.3: Over lock machine

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IMPORTANCE OF LOCK STITCH MACHINE

The lockstitch machine forms accurate straight stitches on the top and the backside of the fabric. Lock stitch machine needs two threads to form a stitch, a lower thread from a bobbin and a needle thread that feeds from the spool thread on top and a rotary hook grabs the needle thread loop as it passes near the bobbin and interconnects the two threads. A complete garment could be stitched on a lockstitch machine. This is similar to home

sewing machine and can be utilized for variety of operations. It is a best choice for the small manufacturer.

The lock stitches look the identical on the top and the bottom they are easily reversible. It is the mainly common type of stitch used for ready-to-wear garments, especially woven as fabric garments the stitches are tight and secure. There are disadvantages to this stitch category, because they don't stretch very far, they rupture easily if used on knits and fabrics which stretch ability are required. But even on knits lock stitch is used for many components such as setting zippers where stability rather than stretch is required. The machine needs to have the proper tension balanced between top thread and bobbin thread. Otherwise it will not have nearly the strength of a properly balanced stitch.

There are two different kinds of lockstitch

i. 1 needle lock stitch
ii. 2 needle lock stitch

2 type of needle lock stitch is same as 1needle, but it has two rows of stitches, which typically have a 0.6 cm space in between. 2 needle lock stitch machines are available to set the space from 0.5 cm up to 1 inch. The advantage of a 2 needle is perfectly parallel neat double row of stitches.

PARTS OF SINGLE NEEDLE LOCK STITCH MACHINE WITH UNDER BED TRIMMER (SNLS)

The Main Parts of SNLS machines are explained below:

Spool pin: It is fixed on upper part of the machine to hold the reel.

Thread guide: It aids to hold the thread in place from the spool to the needle.

Tension disc: The thread goes in between the two concave discs. The thread tension is increased or decreased by a spring and nut.

Take up lever: It is a lever which moves up and down it is fitted to the body of the arm. Its movement feeds the thread to the needle and tightens the loop formed by the shuttle.

Stitch regulator: This manages the length of the stitch.

Spool pin for bobbin winding: thread spool is put on this at the time of bobbin thread winding.

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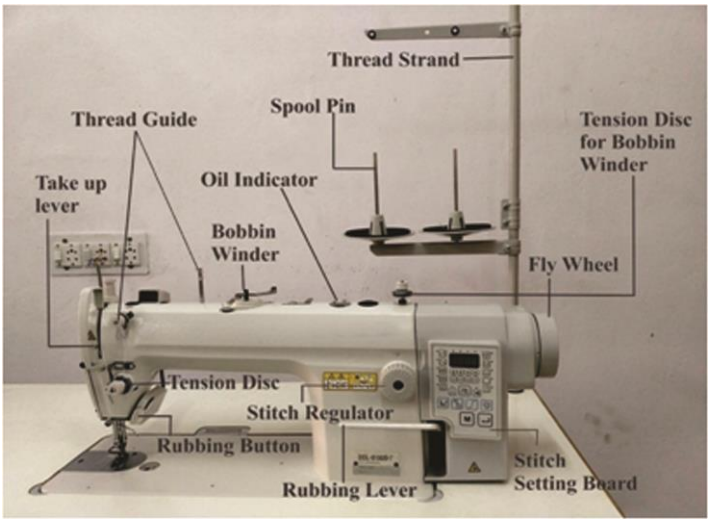

Fig.3.4: Parts of single needle lock stitch machine.

Fly Wheel: When this is made to rotate, it works the mechanism of the motion. It is used by hand to up and down the needle.

Clutch or Thumb Screw: This is in the middle of the fly wheel and it controls the stitching device.

Needle bar: Its major purpose is to give movement to the needle. This is a steel bar which grips the needle at one end with the aid of a clamp.

Needle Plate or Throat Plate: A semi-circular disc with an opening to let the needle to pass through it.

Feed dog: This has of a set of teeth mounted under the needle plate. It assists cloth to move forward during stitching.
Slide Plate: A rectangular plate, which helps the removal of the bobbin case.

Presser foot: When the presser foot is put down it applies pressure constantly on the fabric as the stitching takes place. It is set to the presser bar to hold the cloth firmly in position.

Presser foot lifter: A lever attached to the presser lifter, for raising and lowering the presser foot.

Bobbin case: It encloses the bobbin in the machine and controls the tension of the bobbin thread.

Bobbin winder: It controls the bobbin while winding thread on the bobbin

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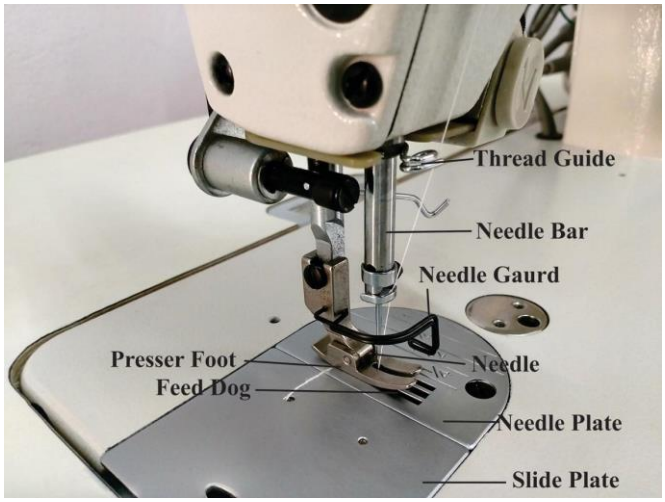

Fig.3.4 (a)

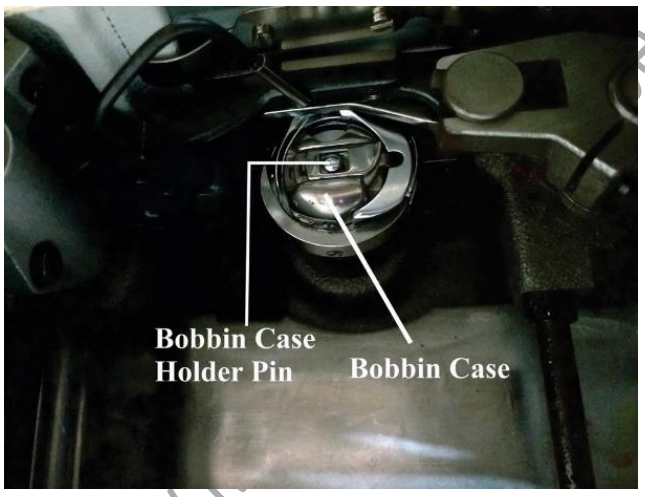

Fig.3.4 (b)

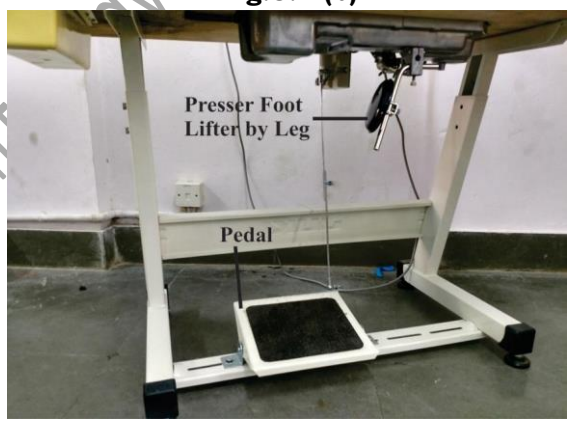

Fig.3.4 (a, b, c): Details of the SNLS machine

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OPERATING STEPS OF LOCKSTITCH MACHINE

1. Connect the plug to the switch board by checking to the type of voltage which suits the motor.
2. Carry on the process of threading for stitching.

3. Sit in the proper posture and switch the machine on.
4. Now the threading is to be done for bobbin winder.
5. Fix the bobbin on the bobbin winder and do the thread winding.
6. Take the bobbin out of the bobbin winder and fix it to the bobbin case and place it in the bobbin case holder.
7. Set the required specification like UBT (Under Bed Trimmer), tacking, motor fastness, etc. in the control box.
8. Set SPC (Stitch per centimetre) using the stitch regulator.
9. Before running the machine check for needle guard, oil level and pedal mat.
10. Before proceeding to the original garment, check the stitch with the sample cloth

For preparing samples on lock stitch machine, one should practice by drawing straight, zigzag, curved line first on a paper. Then slowly and gradually when your hand is set, you can start working on fabrics and final garments. Some examples for practicing on the lock stitch machine are given below:

1. Exercise for hand movement and machine controlling on straight lines

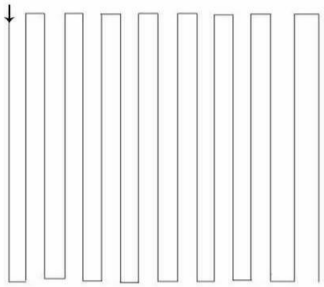

Fig.3.5 (a): Straight lines

2. Exercise for hand movement and machine controlling on curved lines

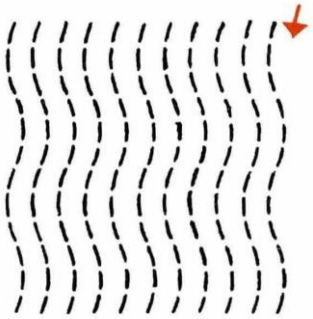

Fig.3.5 (b): Curved line

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3. Exercise for hand movement and machine controlling on straight zigzag lines

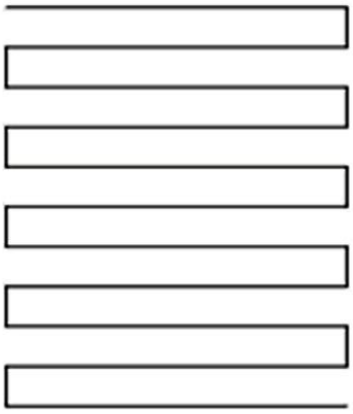

Fig.3.5 (c): Straight zigzag lines

4. Exercise for hand movement and machine controlling on wavy lines

Fig.3.5 (d): Wavy lines

5. Exercise for hand movement and machine controlling on spirals

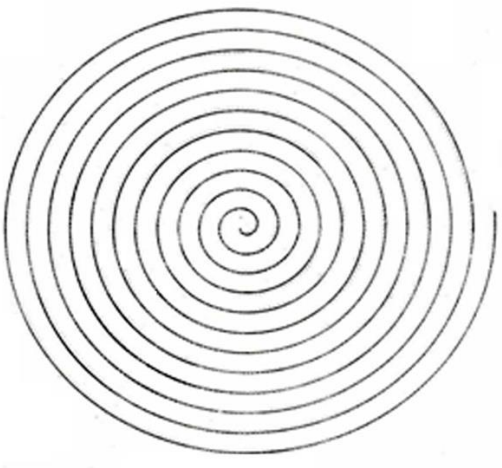

Fig.3.5 (e): Spirals

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6. Exercise for hand movement and machine controlling on curved shapes

Fig.3.5 (f): Curved shapes

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CHECKING MACHINE BEFORE

It is very easy to run a machine but it is very essential how to maintain and use that machine. A skilled operator must know about type of thread/needle/fabric, for quality garment making. You already studied in previous unit about thread, needle and fabric. It is very necessary that garment should be constructed as per buyer's requirement. Whenever you go to buy a garment for yourself, you will not select a garment of poor quality. Before starting machine a good operator always ensures quality and safety which save time, increase productivity. Few steps are given below to achieve quality, fast production and self-protection:

- Ensure power button is switch off and paddle mat is on place.
- Wear shoes before running machine
- Dust particles and oil particles can spoil clothes first ensure cleaning of machine properly.
- There should be adequate light on the machine to avoid wrong threading and accident. Poor lighting affects vision of operator.
- Correct threading is necessary to achieve secure and attractive stitches. Set stitches by combining the needle thread and bobbin thread to function correctly.

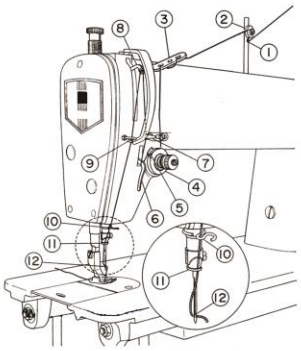

Fig. 3.6: Threading method.

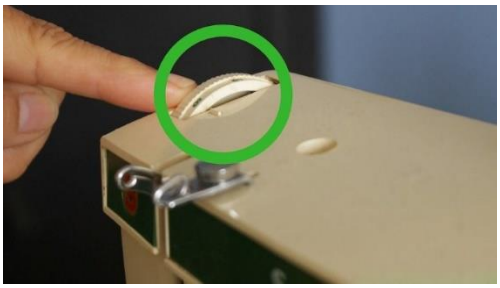

Fig.3.7: Setting the stitch length

- Set stitch length as per specification sheet. It is called SPC (Stitch per Centimetre) through stitch regulator.

Fig.3.8: Stitch regulator

- Back tack mechanism plays important roll. It locks stitching at the beginning and end so that stitch will not open. During using back tack feed dog goes forward and automatically it comes backward and then again it moves fabric forward so three times it stitches on same place thus there is no chance to open thread at the beginning and at the end.

Fig.3.9: Using back tack

- Check needle and needle guard. Needle guard is work as finger guard. Without this guard there is possibility of injury or accident. In basic machines there is only finger guard is available but in specialized machines fibre glass guard is available which saves eyes also.

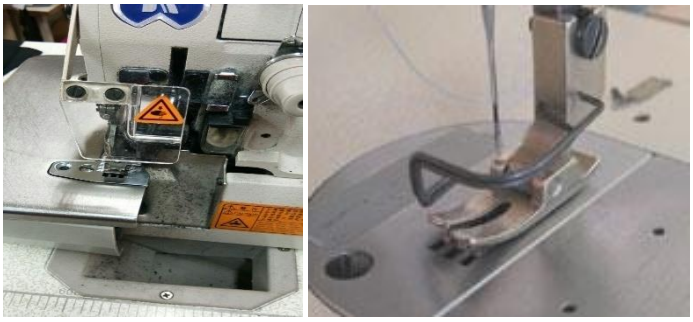

Fig.3.10 (a), (b): Various needle guards

- Place all equipment near- by to save time.
- Use earplugs

Apart from that monthly & quarterly preventive maintenance is also required:

Monthly Check-Up

1. Oil level check properly & clean
2. Bobbin winder proper checking
3. Thread stand cleaning & tight feed dog checking
4. Pressure foot checking
5. V-belt checking
6. Needle plate, needle guard & needle screw checking
7. Belt cover cleaning & tight
8. Pulley & pulley cover checking
9. Hook set check
10. Moving knife & fix knife checking
11. Foot rest checking
12. Head rest pin checking
13. Knee pad & paddle mat checking
14. Fabric guide checking
15. Pedal chain checking
16. Looper checking
17. Waste tube check
18. Lower knife & upper knife checking
19. Eye glass checking
20. Gauge set checking
21. Top feed dog checking

22. Pressure bar checking
23. Gear bearing checking &bobbin case checking
24. Oil lubrication system checking

Quarterly based check-up:

1. Oil change
2. Moto & control box cleaning by air pressure
3. Gear and bearing checking
4. All moving parts checking

Activities

Activity 1: Practice the preparatory process of single needle lock stitch (SNLS) machine before stitching.

Material required:
1. Lock stitch machine
2. Thread and needle of proper size for the lock stitch machine
3. Scissors

Step by step procedure:
1. Set the lock stitch machine
2. Thread the machine properly
3. Practice the preparatory process of single needle lock stitch machine.

Activity 2: Prepare samples on lock stitch machine.

Material required:
1. Practical File
2. Pencil, eraser, pens, Markers
3. Fabric (7" X 7")
4. Single needle lock stitch machine
5. Needle and thread

Step by Step Procedure:
1. Set the machine
2. Prepare samples of lock machine stitches as shown in the exercise samples in the session above.
3. Label them
4. Paste them in practical file.

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Check Your Progress

A. Fill in the blanks:

1. _____ _____ is use to lock stitching at beginning and the end of stitch.
2. Needle guard is used to save _____
3. Full form of SPC_____ _____ _____
4. For shock absorber always wear _____ while running machine

B. Questions:

1. Explain the importance and parts of lock stitch machine
2. Explain the steps of threading the lock stitch machine
3. Explain the importance of checking the machine before stitching

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Session 2: Overlock Machine

Over-lock machines form stitches over the cut edge and neatens the edge of fabric. It functions with 3 stitch forming devices and a pair of Knives.

IMPORTANCE OF OVERLOCK MACHINE

1. A needle to get the thread through the fabric

2. A looper to take the thread from the needle to the rim of the fabric on the bottom

3. A looper or spreader to carry thread up and over the rim of the fabric on the top.

This is a high thread user machine and the stitches stretch.

Over-lock Stitch: A Stitch that locks together at the edge of the seam allowance, finishing the edges as well as sewing the seam.

Table 3.1: Classification of Over-lock Machine

Type of Over-lock machine	Number of Needles used	Number of Threads used	Uses
1-needle Over-lock	1	3	For run stitching in general fabric
2-needle over-lock	2	4	For run stitching in general fabric Tape attaching
Safety stitching	2	5	Side seam attach, sleeve attach, back yoke attach
3 needle safety stitching	3	6	Knitted fabrics Neck rib attach, cuff attach, collar attach

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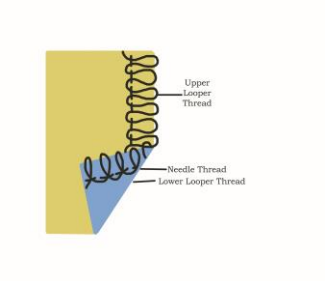
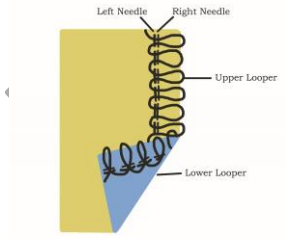
Types of Over-lock Stitches

Types of Over-lock stitch	Threads used	Uses
Type 1: 3 thread over lock stitch 	It uses one needle thread combined with an upper looper and lower looper thread.	• This stitch is often used to clean-finish seam allowances on seams that are already sewn with a straight stitch on a standard sewing machine • It is the seam providing more stretch • This stitch is not well-built enough to use for stitching jointly two pieces of fabric. • The most common seam for knit garments • Seams may not be durable in stress areas
Type 2: 4 thread over lock stitch 	2 needles and 2 loopers both the needle threads interlock with the looper threads when forming the 4-thread over-lock stitch. An extra needle thread secures the stitches	• It is used for edge finishing and seaming stress areas. It is used on knits and woven's • The 4 thread over-lock stitch makes a fairly strong seam, so it's the right choice for sewing together two pieces of light weight or medium weight fabric. It's also flexible so it's good for stretch fabrics. • It is very strong and durable.

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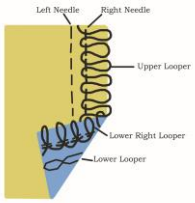
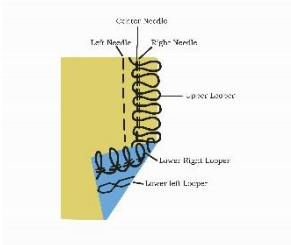
Type 3: 5 thread over lock stitch 	5 thread over-locks uses 2 needles and three loopers, a combination of 2 thread chain stitches and a 2 thread over-lock stitch. This also forms the cover hem stitch	• It provides stable seams with durable seam finishes • Seaming on woven fabrics or very stable knits • This stitch is found in ready to wear garments like shirts, jackets, blouses and jeans
Type 4: 6 thread over lock stitch 	6 thread over-lock uses 3 needles and three loopers	• Shirts, jackets, blouses and jeans

Fig.3.11: Type of over lock machine

DIFFERENT PARTS OF OVERLOCK MACHINE

1. **Thread Guide:** It takes the thread from the spool to the needle. Also feed it through the machine at the proper tension without tangling.
2. **Eye guard:** This is used for the protection of the eyes of the needle used for sewing purposes.
3. **Thread Tension Spring Cap:** The tension of the thread is corrected by this cap,
4. **Feed Dog:** The feed dogs feed the fabric in the sewing direction.
5. **Needle:** Specialty needles are available for specific stitching needs.
6. **Oil Cap:** The major function of an oil cap is to seal the oil reservoir.
7. **Presser arm:** This is a part or bar holding/containing presser foot and presser foot release.
8. **Presser foot**: when the presser foot is put down it applies pressure constantly on the fabric as the stitching takes place. It is set to the presser bar to hold the cloth firmly in position.

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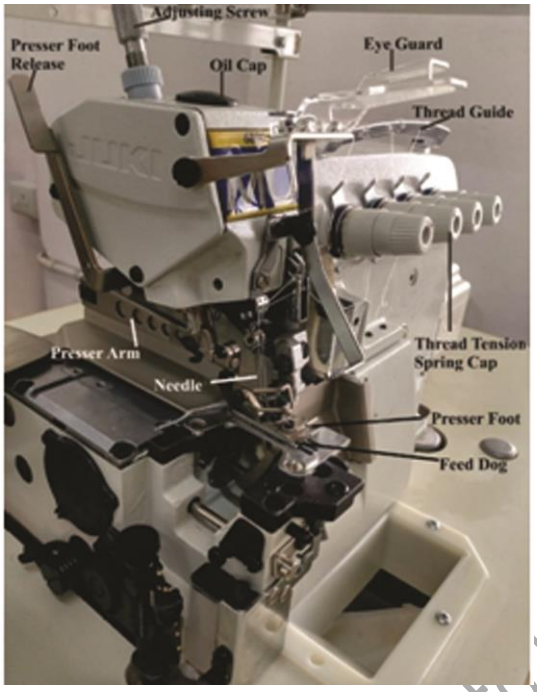

Fig.3.12: Parts of over lock machine

9. Presser foot release:

A lever fixed to the presser arm for raising and lowering the presser foot. When the presser foot is lifted, the tension discs are disengaged, and the fabric will not feed through the machine

Fig.3.13: Steps of threading the over lock machine

OPERATING STEPS OF OVERLOCK MACHINE

1. Connect the plug to the switch board by checking to the type of voltage which suits the motor.

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2. Identify the type of over-lock (3T, 4T, 5T or 6T) of the machine and do the threading accordingly.
3. Clear the dust formed inside the thread guide, before you switch on.
4. Now switch the machine on.
5. Check the presser foot lifter pedal for its tightness and check the guard and the pedal mat.
6. Use the sample swatch and check for the correct formation of stitch.
7. If there is any lack in the formation adjust the tension disk for looper and needle until the required quality stitch arrives.

Activities

Activity 1: Prepare a report on over-lock machines.

Material required:
1. Practical file
2. Pencil, eraser, pens, Markers
3. Camera (if available)

Step by Step Procedure:
1. Browse the Internet/or visit the garment industry and collect the information regarding over-lock machines
2. Prepare a report along with photographs (if possible)
3. Write uses of over-lock machines

Activity 2: Prepare samples on over-lock stitch machine.

Material required:
1. Practical file
2. Pencil, eraser, pens, Markers
3. Fabric sample (7" X 7")
4. Over lock machine
5. Needle and thread

Step by Step Procedure:
1. Set the machine.
2. Prepare samples of over lock machine stitches.
3. Attach them in your practical file.
4. Label them.

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Check Your Progress

A. Fill in the blanks:

1. Over lock machines functions with 3 stitches forming device and a pair of _____.
2. 3 threads over lock stitch machine are mostly used for_____ garments.
3. 4 threads over lock stitch machine are mostly used for_____ fabrics.
4. _____ _____ takes the thread from the school to the needle.

B. Questions:

1. Explain the importance and parts of over-lock stitch machine.
2. Explain the steps of threading the over-lock stitch machine.
3. Explain the types of over lock stitches.

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Module 4 Machines for Ornamental Stitches

Module Overview

Machine embroidery is done with a sewing or embroidery machine to create design on fabric. It is used in uniform adornment, product branding, and corporate advertising. It is also utilized in the fashion industry and garment manufacturing to embellish garments and apparel along with this zigzag machine is also used in industries for special purposes. Both these types of machines are discussed in this unit in detail along with their uses and applications.

Learning Outcomes
After Completing This Module, You Will Be Able To: • Identify and use embroidery machines • Demonstrate the use of zigzag machines
Module Structure
Session 1: Embroidery Machine
Session 2: Zigzag Machine

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Session 1: Embroidery Machines

Machine embroidery is used in clothing, and home décor and household articles. Examples include designs on pillows, wall hangings, quilts, caps, hats, coats, blankets, denim, stockings, and shirts.

Types of machine embroidery:

- Free-motion machine embroidery
- Computerized machine embroidery

1. Free-motion machine embroidery

The main function of this machine is tailoring, but embroidered designs are done by using a basic zigzag attachment. Unique patterns may be created by

free-motion machine embroidery as this is a manual process, and reproducing exactly same design is not possible, unlike with computerized embroidery.

2. Computerized Embroidery Machine

This type of embroidery machines are specialized to create and produce embroidery using computer aided designs. This machine is ideal for bunch production and for complicated designs.

Software

Design software exists in a variety of forms, either as special-purpose tools for a range of design stages or as complete design. Most of the embroidery machines have on board computers that provide some design customization, resizing and even digitizing, the use of software will increase capabilities, creativity and provide added design personalization to the embroidery experience. Embroidery designs can be sold over the Internet it is stored in a file formats.

Hardware-software interaction

1. Computer-controlled directly from a computer. It exists in the industry.
2. Computer-controlled via file upload, i.e. specific firmware in the machine will read a proprietary CNC file and execute it.
3. Computer-powered, i.e. the machine will have more than a single motor and stuff is synchronized with a computer instead of complex mechanics. It exists in low and mid-end home sewing machines.

Basic Steps in Creating Computerized Embroidery is as follows:

1. Make a digitized embroidery design file.
2. Mix with other designs and edit the design.
3. Change to machine executable code, i.e. a stitch file typical formats of the embroidery machine are: art, .pes, .jef, .sew and .hus etc.
4. In the embroidery machine load the final design file
5. Even out the fabric and put it in the machine
6. Start and monitor of the embroidery machine.

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Types of Computerized Embroidery Machines

1. Single Head Embroidery

Single head computerized embroidery machines can be 9 colour, 12 colour or 15 colour machines. These machines are cylinder bed type and therefore, one can do the embroidery on caps, readymade shirts, and other garments.

Fig.4.1: Single head embroidery machine

2. Multi Head Embroidery Machine

Multi-head embroidery creates flat embroidery or pile embroidery. They are called multi-head because a number of machines are operated by the same computer system simultaneously. Multi-head machines are multipurpose and can work with a variety of threads, ribbons or bead/sequin strands. They can include one or more colours of threads to create simple or elaborate designs in small or large scale. Designs and emblems can be produced by this machine, which are stitched to make such as leather jackets, hats and shirts or used to stitch crests, logos and other designs on finished items.

Fig.4.2: Multi head embroidery machine

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3. Tubular Embroidery Machines

This type of machines comes with multitude of accessories like tubular frame/hoop, cap frame, socks frame, shoe frame, shirt pocket frame, stencil frame, magnetic clamp frame, trouser frame and ribbon embroidering devices. It gives an opportunity to find individual solutions for specific demands. The tubular frame is used to decorate beach fashion robes, t-shirts, sweat-shirts etc. at High Speeds. The sock frame enables to decorate pair of socks, shoe frame enables the individualization of shoes and shirt pocket frame enables to decorate shirt pockets.

4. Chenille Embroidery

It is a needlework originated in France. This embroidery is made with fine chenille yarn in flat stitches, producing a velvety effect. Chenille yarn is a special yarn with pile protrudes on all sides. Chenille embroidery machines produces both chenille stitches known as moss stitches and chain stitches. The machine uses only single thread for moss and chain stitches. Chenille machines are both manual and electronic which can use a range of threads and needles sizes to create different appearances massively.

- Chain stitch is used for monogram border
- Moss stitch is a loop stitch they are mostly used to fill in parts and produce depth by using wool, cotton, or acrylic yarns, it creates a exclusive texture

5. Mixed Chenille Embroidery Machine

Mixed embroidery function automatically changes among flat embroidery heads and chenille heads, automatic colour change, automatic raising function of needle and press bar, automatic chenille needle height control, all through combined embroidery design working process.

Advantages of High Speed Motorized Machines for Embroidery

1. Achieves maximum speed up to 1200 rpm
2. Has 15 Needles and 20 heads
3. Stitch Length of 0.1-12.7mm
4. Automatic colour change
5. Automatic trimmer
6. Automatic redeem embroidery and automatic detection of thread breakage.

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Activities

Activity 1: Prepare a collage of different type of embroidery machines.

Material required:
1. Pictures of different embroidery machine
2. Chart sheet glue
3. Pens and markers
4. Ruler
5. Scissors
6. Camera (if available)

Step by Step Procedure:
1. Browse the Internet/Books or visit embroidery units and find the different embroidery machines available in the industries.
2. Collect the pictures (if possible).
3. Cut then very neatly.
4. Paste them on chart sheet & prepare a collage.
5. Label then.

Check Your Progress

A. Fill in the blanks with the most appropriate answer from the choices given below

1. In free-motion embroidery machine, designs are created by using _____.
   a) Flat lock b) Cross lock c) Zigzag d) Over-lock
2. _____ embroidery is a needle work that produces a velvety effect.
   a) Machine b) Chenille c) Chain d) Computerized

B. Questions:
1. Explain the types of embroidery machines and their uses.
2. Explain the advantages of high speed motorized machines for embroidery.

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Session 2: Zigzag Machines

Zigzag sewing machine is intended for sewing zigzag stitches. A zigzag stitch is an alternative geometry of the lockstitch. It is mostly used for joining two work pieces edge to edge and stitching stretchable fabrics, they have been usually used for sewing inner wear. To stitch two pieces of knit fabric together, a thin zigzag stitch should be used. Lock stitches are constructed with a bobbin thread and needle forming a symmetrical zigzag pattern. This kind of stitch is made with 2 threads, one needle thread, and one bobbin thread. A loop of needle thread is taken through the fabric and with bobbin thread it is interlaced.

Uses of Zigzag Sewing Machine

- To join lace and elastic
- For decorative stitches in ladies' wear, knitted articles, towel, handkerchiefs, foundation garment and swimming wear.
- To sew athletic wear, appliqués, attach lace on lingering and faggoting and monogramming
- In bra manufacturing and jacket manufacturing

DIFFERENT PARTS OF ZIGZAG SEWING MACHINES

FIG.4.3: Parts of zigzag sewing machine

1. Thread guide
2. Tension disc
3. Take up lever
4. Stitch regulator
5. Spool pin for bobbin winding
6. Fly wheel

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7. Bobbin winder
8. Clutch or thumb screw
9. Needle bar
10. Presser foot
11. Feed dog
12. Needle plate or throat plate
13. Slide plate
14. Bobbin case
15. Presser foot lifter

OPERATING STEPS OF ZIGZAG SEWING MACHINE

- Press fabric for finishing
- Adjusting the length: A higher number will make the bigger zigzag on the fabric making a flatter-looking stitch. The lower and higher number makes the stitch lengths smaller and longer. If the number is smaller, then each stitch is smaller and you would get a satin stitch. So medium length stitches is ideal for zigzag.
- Adjusting the width: A higher number will make each zigzag stitch wider in width, making the zigzag look bigger. In smaller number slant of each stitch will be shorter, which creates a small size zigzag. So medium width is ideal for zigzag
- Set machine on zigzag to stitch and test the stitch on a rough piece of fabric
- Stitch near the edge of the fabric, enclosing the unfinished edges of the fabric. During the stitching while making the zigzag stitch the needle moves left and right
- Take care of the seam allowance as one piece if the seam is folded to one side, treat each part of the seam allowance separately, if the seam allowance is pressed open
- After completing the seam finish press the seam should be ironed again

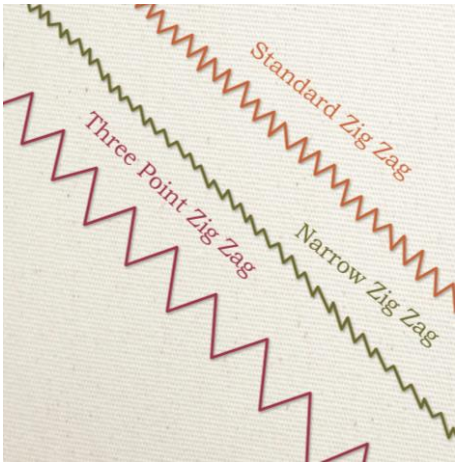

Fig.4.4: Various Zigzag stitches

Activities

Activity 1: Threading practice of zigzag machine & prepare samples.

Material required:
1. Zigzag machine
2. Fabric sample (7" x 7")
3. Scissors
4. Needle, thread
5. Pen/pencils
6. Practical file
7. Glue

Step by Step Procedure:
- The supervision of your teacher/guide practices the threading of zigzag machine and prepares samples.
- Attach then on practical file.
- Label them

Check Your Progress

Fill in the blanks:
1. A zigzag stitch is a variant geometry of the _____ _____.
2. Zigzag machine is used to join trimmings like lace and _____.
3. _____ length stitches is ideal for zigzag.

Questions:
1. Explain the parts of zigzag machine and its uses.
2. Explain the operating steps of zigzag machine.

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Module 5 Machines for Attachments

Module Overview

Button machine is highly technical specialized machine in garment industry to sew button of various sizes on garments. They are also used for making buttonholes in the garment and for finishing the edges. These machines are specialized machines and require good working skills to operate them. This unit explains about these machines, their parts, threading steps and operating procedure in detail. These work at high speed and save a lot of time in garment manufacturing when compared with hand sewing of buttons and buttonholes. Along with that they help in giving proper finishing and setting as per the size of different buttons.

Learning Outcomes
After Completing This Module, You Will Be Able To: • Demonstrate belt & loop attachment and button sewing machine • Demonstrate button hole machine
Module Structure
Session 1: Belt& Loop And Button Attachment Machines
Session 2: Buttonhole Sewing Machine

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Session 1: Belt & Loop Attachment and Button Sewing Machine

BELT-LOOP SETTER FOR TROUSERS AND JEANS

Fig.5.1: Button sewing machine

Belt-loop setter enables belt-loop length change in just a few seconds automatically. It allows sewing of fully user-customable tack patterns by electronically-driven feeding and needle system. Features of belt-loop setter machine are given below:

Fast Adaption:

Exclusive adaptable system in machine permits ultra-fast change to different belt-loop lengths in only a few seconds. Beside a possible belt-loop changing the width, time taken between switching production batches is significantly reduced.

Sewing Dimensions:

This machine usually has the ability of sewing wide range of belt-loop dimensions. Belt-loop length is mechanically adjusted by mechanism of four stepper motors, and loop width is easily changed by only one manually-adjustable element.

Cutting:

Machine can carry out straight and cross (X-shape) cutting. Exchange between the straight and cross cutting style can be done quickly because there is only one knife in the machine, which is rotated for X-shape cutting.

Operating supporting functions:

Operator is provided with the following functions to speed up the machine for daily usage time and reduce machine down-time.

- **Front & Back Bottom**-Thread bobbin exchange mode– bedplate of machine is moved sideways in such a way that looper with bobbin is easily accessible.
- **Thread Winding Mode** –Position for bottom thread bobbin winding is automatically fixed and winding starts by pressing a single button.
- **Belt-Loop Release Button** - This button can be released for ready-to-sew belt-loop. If it is not prepared properly owing to external factors or while changing a batch of another belt-loop style.

High resolution full colour touch screen:

Cutting: All the stitching functions are shown on a high resolution 5.7" LCD full-colour touch computer screen display. The use of easily comprehensible symbols on the display makes it possible to operate the machine with minimum training time required.

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SEWING RANGE AND STYLE:

Belt-Loop Length:

The range of length of belt-loop can be adjusted automatically in the range of 35 to 100 mm. Operator change mechanism properties of machine with touch screen panel, while changing the belt-loop length.

Belt-Loop Width:

Range of belt-loop width is usually 10-30mm.

Sewing Pattern:

Sewing section of 30" x10" can be utilized to create fully customable pattern, where bar-loop bar tack may be stitched with twin needle machine.

Belt –Loop Extension:

Based on customer's request, the belt-loop can be increased up to 10 mm. Length of this increase is comfortably adjusted.

BUTTON MACHINE

Button machine is highly technical specialized machine in garment industry. Sewing/Fixing a button by hand is very tiresome and time consuming job. Some time it is very difficult to get good quality and strength through hands. In manufacturing units where 1000 to 5000 garments produce every day, if operator will fix buttons by hand than it is not possible to fix these many buttons on daily basis. There will be bottle neck in process and cost of fixing button will be too high. Through button machine single operator can fix more than 10000 to 15000 buttons in a day with good quality and can earn handsome remuneration.

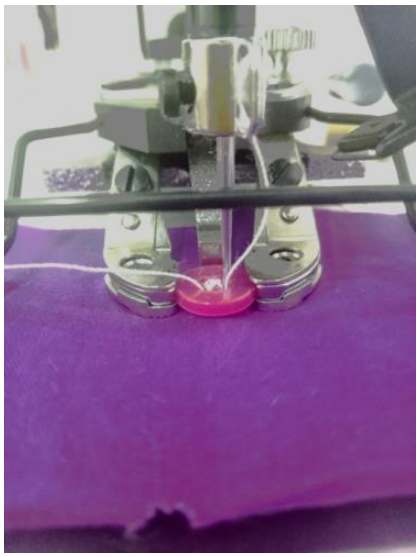

Fig.5.2: Button sewing machine

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DIFFERENT PARTS OF BUTTON SEWING MACHINE:

Detail description same as given in parts of over lock machine

Needle: Needle helps in forming a stitch in the garments.

Take up Lever: The function of take up lever is to maintain the thread tension at the accurate level

Tension Disc: The thread tension is controlled by a spring and nut which increases or reduces pressure of tension. The thread goes through the two discs put together.

Fig 5.3: Parts of button sewing machine

Bobbin Winder-Bobbin winders are used to wind thread onto the empty bobbin. Bobbin winders can be found at the top, end of the machine.

Thread Guide: It keeps the thread in place from the spool to the needle.

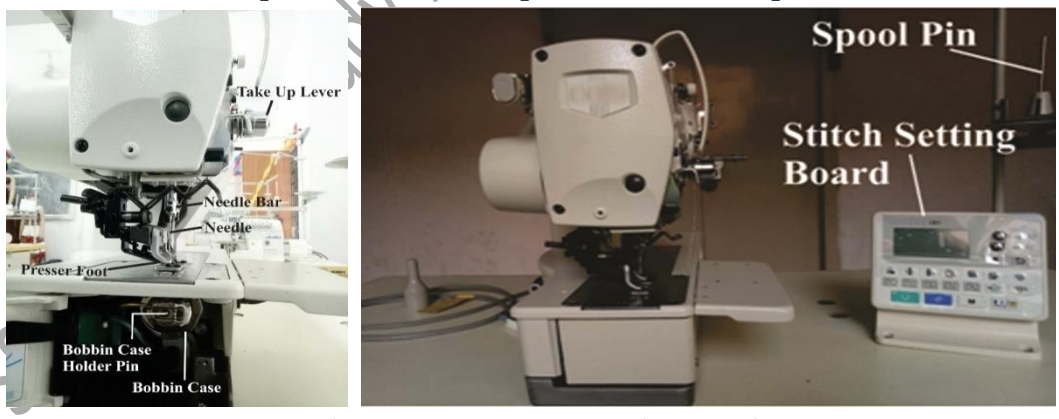

Fig 5.4 (a) (b): Button sewing machine and its parts

Presser Foot: The presser foot puts pressure on the fabric to keep it going smoothly along and prevent any wrinkles that could mess up the stitch

Spool Pin: The main purpose of spool pin is to grip the spool of thread.

Stitch Setting Board: To control the stitches at sewing machines as well as size of the stitch.

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IMPORTANCE OF BUTTON SEWING MACHINE

A special machine is used only for stitching button in a garment without damaging it. By changing the setting different sizes of button can be attached on the same machine. The button placement can be automatic. Stitching is carried out as per the opening in button and it may be lengthwise or crosswise a variety of buttons with two /four holes could be stitched on this machine by doing easy adjustment. The stitching is done by sequence of parallel stitches its length is equal to the distance between the middle of the holes. The button shifts sideways with the aid of button clamp for stitching but the needle has vertical movement. As special attachment, hopper feed is mechanically feeds the button to the clamp of the needle point of the machine.

Fig 5.5: Button Sewing machine preparation

THREADING STEPS OF BUTTON MACHINE:

Step-1

Keep your thread roll into thread holder plate and pass this thread from thread guide.

Fig.5.6: Button sewing machine threading-step1

Step-2

Pass this thread to another guide located on the top of machine body (these guides are there to support thread).

Fig.5.7: Button sewing machine threading- step2

Step-3

Now take thread through tension disc as per arrow marks in picture. Tension disc plays important role in seam. Through this upper thread's tension of machine can be adjusted. We can tight or loose thread as per requirement.

Fig.5.8: Button sewing machine threading– step3

Step-4

Next, thread has to pass through thread guides. A machine can have many thread guides which hold thread. So that thread will not interrupt operation neither it gets spoil/waste.

Fig.5.9: Button sewing machine threading– step4

Step-5

Again follow direction of arrows and pass the thread through next thread guide.

Fig. 5.10: Button sewing machine threading– step5

Step-6

Take thread through take up cover and through next thread guide.

Fig.5.11: Button sewing Machine threading– step6

Step-7

Pass the thread through thread take up lever.

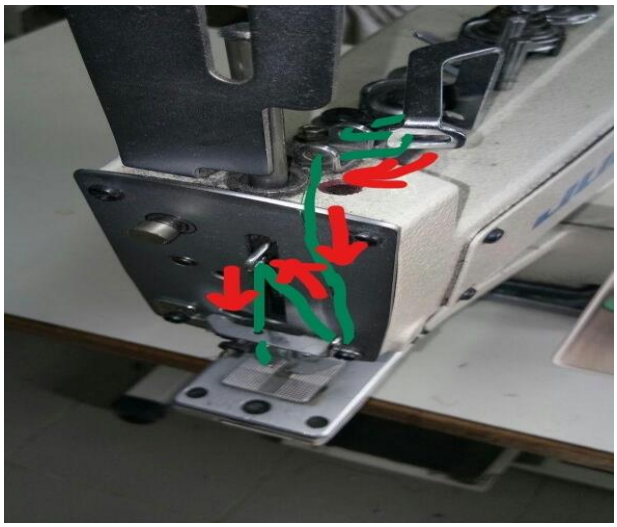

Fig.5.12: Button sewing machine threading– step7

Step-8

Finally pass thread through needle

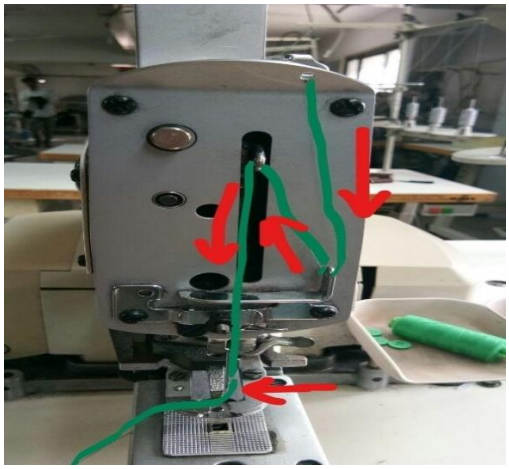

Fig.5.13: Button sewing machine threading– step8

All above pictures are showing step by step threading in machine. Threading is most important job during fixing button. Threading is quiet complex and tiresome job. One has to practice it again and again. Red arrows are showing direction while green colour is representing thread. Practice makes man perfect so through practice required to learn threading.

Steps of Sewing a Button

To sew a button on garment, follow the steps given in pictures below to sew a button:

1. Connect the plug to the switch board by checking to the type of voltage which suits the motor.
2. Carry on the process of threading for stitching.
3. Take matching thread (which is matching with button and fabric) and insert in machine.
4. Mark the button placement on top of the fabric.
5. Sit in the proper posture and switch the machine on.
6. Now the threading is to be done for bobbin winder.
7. Fix the bobbin on the bobbin winder and do the thread winding.
8. Take the bobbin out of the bobbin winder and fix it to the bobbin case and place it in the bobbin case holder.
9. Set the required specification like buttonhole length, stitch tightness and speed etc. in the control panel.
10. Before operating the machine check for needle guard and pedal mat.
11. Refer the stitch as per the requirement in the buttonhole length, stitch formation etc.
12. Precede the stitch in the button hole marked area of the original garment.

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Fig. 5.14(a, b): Button sewing marking

Fig.5.15: Button sewing

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PREPARATION BEFORE FIXING A BUTTON

1. Choose right buttons for right fabric: Two holes flat buttons are suitable for light or medium weight fabric.

Fig.5.16: Two holes buttons

Four holes flat buttons are suitable for heavy weight fabrics, which can bear weight.

Fig.5.17: Four holes button

2. Mark on appropriate on fabric through fabric marker or pencil where buttons has to be fixed
3. Check machine setting (width setting) as per button, so needle should come into the whole and will not hit the button
4. Needle guard should be on proper place
5. Feed dog is very important part, placing of button on feed should be correct.
6. Button should be fix as per buttonhole size

Samples:

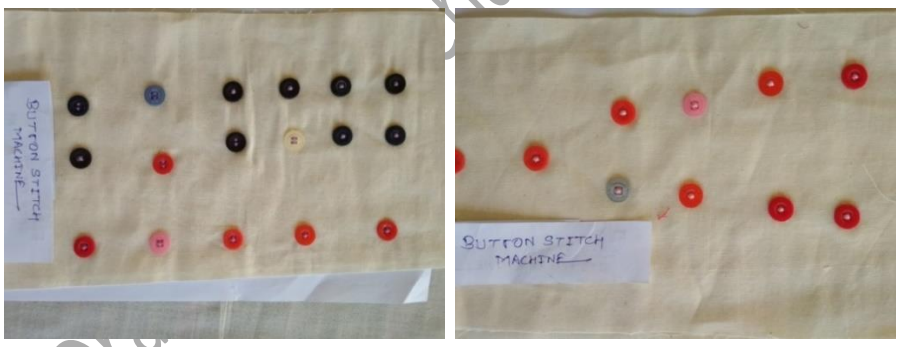

Fig.5.18 (a, b): Button sewing sample

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Activities

Activity 1: Make samples using button sewing machine.

Materials Required:

1. Button sewing machine
2. Fabric sample (7”x7”)
3. Thread, needle
4. Button
5. Marker

Step-by-Step Procedure:

1. Mark the place for sewing the button
2. Sew the button on a fabric sample of different types and sizes
3. Finish the sample and attach in practical file
4. Label them

Activity 2: Find out different types and sizes of buttons and paste it in practical file, also fix different type of buttons on fabric swatches.

Materials Required:

1. Practical file
2. Pencil/pen
3. Eraser
4. Colour Pencils
5. Ruler
6. Sharpener
7. Different type of buttons
8. Fabric sample (7"x7")
9. Scissors

Step-by-Step Procedure:

1. Collect different types of buttons of various sizes and sew them on the fabric sample
2. Finish the sample
3. Attach the sample in practical file
4. Label them

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Check Your Progress

A. Fill in the Blanks:

1. Belt and loop setter machine can cut belt straight and _____.
2. Different sizes of button can be attached on the same machine by changing the _____ .
3. Various types of buttons like a button with two holes, four holes or _____ could be sewn on this machine by simple adjustment.
4. A _____ _____ is a special attachment that automatically feeds the button to the clamp of the needle point of the machine.

B. Questions:

1. Why button machine has significant role in industry?
2. Explain belt & loop attachment machine.
3. Write importance of buttons sewing and belt long attachment machine.

Session 2: Buttonhole Sewing Machine

Buttonhole machines are used for making buttonholes in the garment and to finish the edges. Buttonholes are openings in fabric which let the buttons to pass through, for keeping one part of the fabric to another. The unfinished edges of a buttonhole are finished with stitching.

Fig.5.19: Buttonhole sewing machine

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DIFFERENT PARTS OF BUTTONHOLING SEWING MACHINENEEDLE

Detail description same as given in parts of over lock machine

Needle: Needle helps in forming a stitch in the garments.

Take up Lever: The function of take up lever is to maintain the thread tension at the accurate level

Tension Disc: The thread tension is controlled by a spring and nut which increases or reduces pressure of tension.

Fig. 5.20: Parts of buttonhole sewing machine

Bobbin Winder-Bobbin winders are used to wind thread onto the empty bobbin. Bobbin winders can be found at the top, end of the machine.
Thread Guide: It keeps the thread in place from the spool to the needle

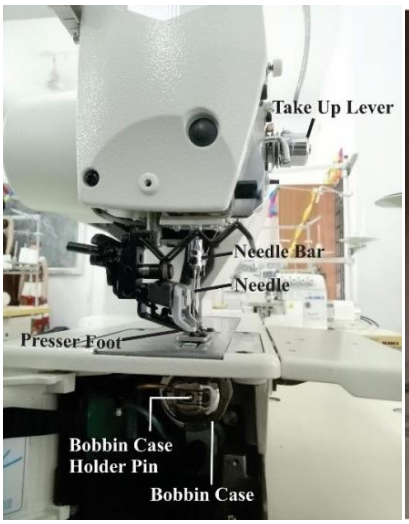

Fig.5.21 and 5.22: Parts of buttonhole sewing machine

Presser Foot: The presser foot puts pressure on the fabric to keep it going smoothly along and prevent any wrinkles that could mess up the stitch
Spool Pin: The main purpose of spool pin is to grip the spool of thread.

Stitch Setting Board: To control the stitches at sewing machines as well as size of the stitch

IMPORTANCE OF BUTTONHOLE MACHINE

Like button sewing machine, buttonhole machine has also significant role in apparel industry. An operator can make almost 10000 to 15000 pcs per day. So it is very useful in bulk production. But due to heavy cost it is not suitable to boutique, tailoring shop. Buttonhole also has computerized panel where an operator can set stitches, length & width of buttonhole machine is used to create button holes in the garments and to finish the edges. Various type of button hole is formed by buttonhole machine. The style of hole depends on the button. The machine offers easy and quick adjustments when changing buttonhole size to match the button size. For heavy fabric, the hole is cut before sewing. For lighter fabric, the hole is cut after sewing. Button holes can be made with different stitch density like in shirts, trousers and polo shirts. There are many built in stitch patterns like single stitch, double stitch, purl stitch, whip stitch and keyhole which can be done with minor adjustments. Button holes machine forms basic stitch or chain stitch.

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USES OF BUTTONHOLE MACHINES

It is used for buttonholing jeans, chino pants, Men's and Ladies jackets.

Fig.5.23: Buttonhole machine

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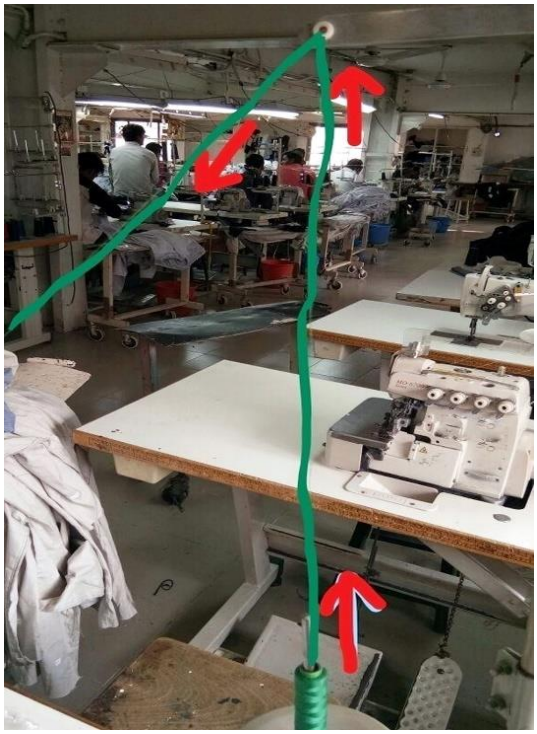
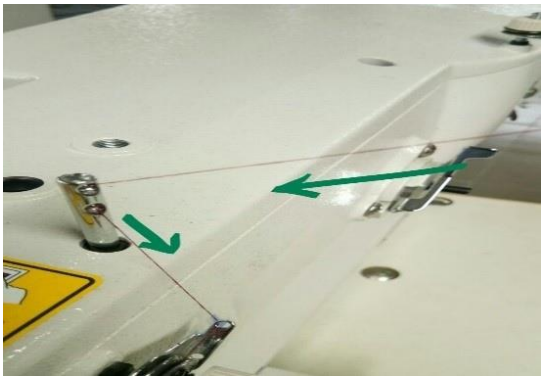
THREADING STEPS OF BUTTONHOLE MACHINE

Step-1-



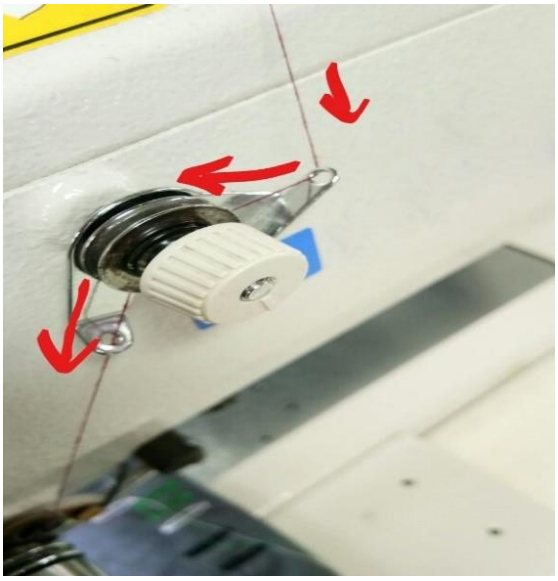
Step-1

Step-2



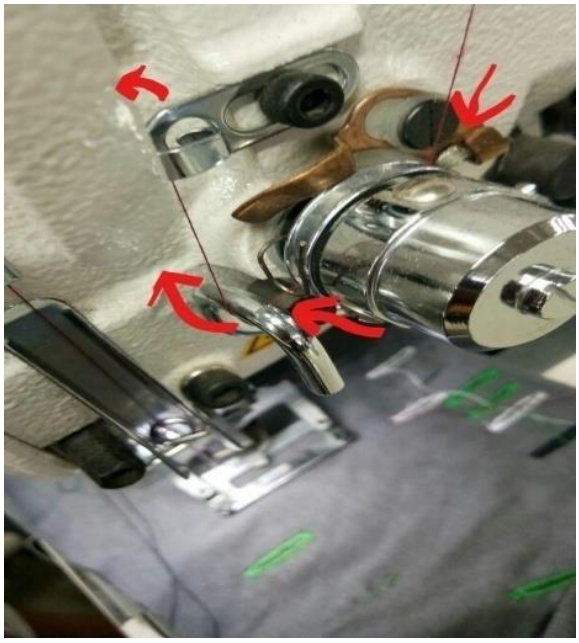
Step-2

Step-3



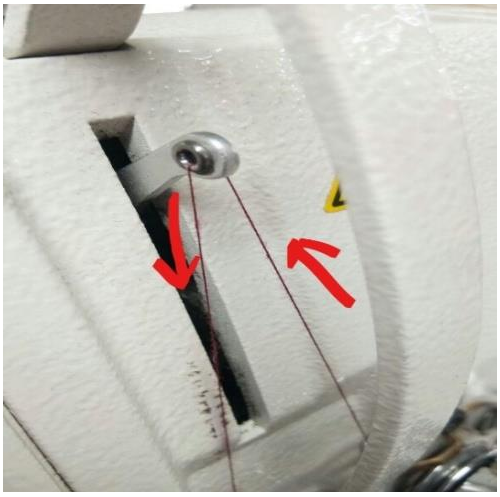
Step-3

Step-4



Step-4

Step-5



Step-5

Step-6

Step-6

Step-7

Step-7

Fig.5.24: Threading the buttonhole machine (Step-1-7)

OPERATING STEPS OF BUTTONHOLING MACHINE

1. Connect the plug to the switch board by checking to the type of voltage which suits the motor.
2. Carry on the process of threading for stitching.
3. Sit in the proper posture and switch the machine on.
4. Now the threading is to be done for bobbin winder.
5. Fix the bobbin on the bobbin winder and do the thread winding.
6. Take the bobbin out of the bobbin winder and fix it to the bobbin case and place it in the bobbin case holder.
7. Set the required specification like buttonhole length, stitch tightness and speed etc. in the control panel.
8. Before running the machine check for needle guard and pedal mat.
9. Refer the stitch as per the requirement in the buttonhole length, stitch formation etc.
10. Proceed the stitch in the button hole marked area of the original garment.

Sample Making

Step 1 Mark on fabric for buttonhole placement

Fig.5.25: Sample making of buttonhole marking

Step 2 Adjust width and length of button hole on control panel. Place the fabric under feed dog

Fig.5.26: Sample making of buttonhole - sewing on the marking

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Step 3 Switch on machine and you will see button hole

Fig.5.27: Finishing the buttonhole

Fig.5.28: Buttonhole ample

Activities

Activity 1: Make samples using buttonhole sewing machine.

Materials Required:

1. Buttonhole machine
2. Fabric sample (7”x7”)
3. Thread, needle
4. Scissors
5. Marker
6. Glue

Step-by-Step Procedure:

1. Mark the place for making the buttonhole
2. Sew the buttonhole on a fabric sample
3. Finish the sample and attach in practical file
4. Label then

Activity 2: Prepare a collage of treading steps of buttonhole machine.

Materials Required:

1. Practical file

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2. Pencil/colour pencils
3. Eraser
4. Ruler
5. Sharpener
6. Pictures of different type of buttonholes
7. Scissors

Step-by-Step Procedure:

1. Collect pictures of different buttonhole samples on garments
2. Cut the pictures very neatly and prepare collage of these pictures
3. Place the chart in classroom or practical lab

Check Your Progress

A. Fill in the Blanks:

1. An operator can make almost per day _____ to _____ pcs. On a buttonhole machine.
2. The main function of _____ _____ is to hold the spool of thread.
3. _____ fabric, the hole is cut before sewing and for _____ fabric, the hole is cut after sewing.

B. Questions:

1. Explain the threading process of buttonhole machine with the help of diagrams.
2. Explain the operating process of buttonhole machine.
3. Explain the importance of buttonhole machine.

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Module 6	Personal Hygiene and Cleaning and Maintenance at Workplace

Module Overview

Health and safety measures are important to be followed as health and safety of the employees in a manufacturing unit affects the production line which may lead to growth of the firm. If proper health and safety measures are followed in every unit, the possibilities of hazards at the work place can be minimized. In this unit importance of health and safety measures are explained in detail.

Personal health and hygiene is also significant in a tailoring/manufacturing unit. Significance of personal hygiene is explained with the help of factors that affect the maintenance of good health. As it is always said that a healthy employee can give a better contribution at a work place, it should be considered in the sewing department as well.

Cleaning and maintenance of work place and the tools and material used in the tailoring unit are a major aspect which needs to be taken care of. The term maintenance is explained and the benefits of cleaning and maintained work place environment. Sewing machine is the main element of the tailoring unit so proper and timely oiling, maintenance and proper storage of material is important to avoid wastage. All these topics are discussed in detail in this unit.

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Learning Outcomes
After Completing This Module, You Will Be Able To: • Understand personal health and hygiene • Demonstrate cleaning and maintenance at workplace • Cleaning and maintenance of specialized machines
Module Structure
Session 1: Personal Health and Hygiene
Session 2: Cleaning and Maintenance at Workplace
Session 3: Cleaning and Maintenance of Tools, Equipment and Specialized Machines

Session 1: Personal Health and Hygiene

The World Health Organization (WHO) defines health as a state of complete physical, mental and social wellbeing. So good health is not the mere absence of disease, it means mental and emotional health as well as the normal functioning of the body often referred to as "physical health." Health is not an end in itself; it is an attribute or quality of a human being which enables him to live with the greatest satisfaction to himself within the framework of the society to which he belongs. A person can have a healthy outlook towards life in-spite of pain and physical handicaps. Health and disease are not complete opposites. They are degrees of each. Even the sickest person retains a number of normal functions and even the healthiest has some problems.

There is no such thing as perfect health. On the other hand, there is high level of health whose possession makes life, zestful and meaningful and whose absence, depletes, prevents and sometimes embitters total life achievements. Personal health in this sense is difficult to achieve in an unhealthy disease ridden community. Hence a person who wants to be healthy must take some responsibility for community health. Science has made advances and provided necessary insight into causes and cure of diseases. At present, development is being made in the field of medicine, education, and surgery, also in public health. Attempts must be made to give everyone a chance to lead a fuller and healthier life making as individual aware of the dimensions of health and what he should do to remain healthy and happy and to play the required role as a member of this community. A healthy man can contribute much more to making this world a better place to live in.

Personal hygiene can be defined as the principle of maintaining cleanliness and grooming of the outer body for a pleasing appearance. People are aware of the importance of hygiene for thousands of years. Personal hygiene refers to the complete cleaning of and caring for your body. Applying and following good personal hygiene practices has health and social advantages.

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Health Benefits

Keeping your body clean is very important in fighting and averting illness for yourself and for co-workers in the organization. Washing your hands can prevent the spread of germs from one person to another. A clean body reflects good energy and confidence in ones personality. Flossing and brushing your teeth can reduce the likelihood of oral and other form of diseases.

Social Benefits

In society, poor personal hygiene is regard as a sign of illness. Maintaining your body clean can reduce body odour, keep the diseases away, subsequently improving others perceptions and image of you. Good personal hygiene is very helpful in developing your own self-image and self esteem

Personal Hygiene At the workplaces an important and delicate issue; this is particularly true while handling an employee's personal hygiene. This issue can be taken care properly and without offending anyone. The workplace should be clean, safe and secure, employees should be less exposed to germs.

In most industries, good employee hygiene is a legal requirement. When employee use toilets using flush and hand washing is necessary. Poor hygiene can affect the productivity of the entire workforce. An employee who is unclean, smells awful can make other co-worker feel uncomfortable or, they are likely to spread infectious diseases, to other employees. Strict rules on proper hygiene will make the entire workplace a healthier, safer, and more enjoyable place to work.

Some of the factors that affect the maintenance of good health are:

1. Physical well being

This means the correct use of the body mechanisms at every stage of life – maintain physical fitness. This is possible by:

(a) Avoid fatigue – At first sign of physical or nervous fatigue get rest.

(b) Save energy – Do work with minimum waste of energy. Develop good posture, and methods of doing work with test strain to the body. Plan work places and work schedules such that unnecessary fatigue can be avoided.

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(c) **Eat sensibly** – Eat foods that meet the nutritional needs, eat regular meals at regular times. Don't overeat. When emotionally upset or overly tired, it is wise to eat for something before a meal.

(d) **Dress sensibly**- Your clothes should protect you against extremes of weather. Avoid clothes which are too tight or ill-fit. Wear clean surroundings etc.

(e) **Cleanliness** – A regular bath, clean clothes, clean surroundings etc.

(f) **Fresh air** – The workplace and the surroundings should be such that they provide warmth, comfort and airiness. Each person needs to find the conditions related to airiness, warmth and humidity to which his body responds best. Some people may like the air to be warm and moist while others may like it to be cool and dry.

(g) **Rest and Sleep** – The amount of sleep necessary for good health varies greatly from person to person. Eight hours each night may appear to be average but the real test is how one feels. Chronic fatigue may accumulate and cause serious illness at times.

(h) **Exercise and sports** –Regular exercise contributes to healthy living. Some people can safely engage in very strenuous sports and exercises without any ill effects but it is advisable to consult a doctor on the type and amount of exercise one can undertake. Walking is the best and the safest form of exercise. A brisk regular walk will do a great deal for one's muscle tone, circulation and general health. It also helps a person to relax from the pressures of day-to-day living.

(i) **Prevent accidents** – Be conscious of accident hazards and provide necessary safety measures.

(j) **Drinking and smoking** – Alcohol is a stimulant, seems to lessen fatigue and make one energetic. It is harmful in certain diseases and should be indulged in moderation only. Excessive drinking prevents the person from eating properly and thus increasing chances of ill health and disease. Coffee and tea are also stimulating, must be taken in moderation. Excessive use may lead to restlessness, over activity, nervousness, insomnia and excessive urination. Even cold drinks contain caffeine, hence their use must be restricted.

Smoking causes diseases like cancer and diseases of the lungs and so should be avoided altogether.

(k) **Medicines, drugs and narcotics** – Consult your physician before taking any drugs and use them exactly as they directs. Avoid using old medicines used earlier for similar ailments or those prescribed for a friend for a similar ailment. Excessively high doses are harmful. Do not obscure symptoms by self-medication or over-drugging. Besides, there is always the grave risk of becoming addicted which results in deterioration of the body and mind.

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2. Mental and emotional well-being

A large proportion of illness has been found to be caused by emotional disturbances which seem to have no relation to the disease itself. Some of us are fortunate enough to be able to control our emotions. Others on the contrary allow them to run rampant or suppress them unduly.

Rules of mental health

(a) Try not to worry. Time minimize all troubles.
(b) Don't brood over the past. Think about the future.
(c) Make the best of each situation. Nothing is really as bad as it appears at first.
(d) Envy is a natural feeling but try to limit your desires to things which are reasonable and attainable.
(e) Cultivate a sense of humour.
(f) Cultivate tolerance for opinions and emotions of others.
(g) Find interesting hobbies to occupy time and means of satisfaction.
(h) Don't look out for scapegoats when things go wrong.
(i) Everybody needs love and appreciation; show this with kind words and gifts.
(j) Get over immediately with all unpleasant jobs. Worrying will not help in any way.
(k) Learn to love and respect and feelings and desires of each family member.

3. Social well-being

Health enables one to be a healthy and involved member of his community. The social wellbeing of a community is greatly related to its progress, broadmindedness, thoughtfulness, sympathy and consideration of each member of the society. Education, productivity and social security enjoyed by the members of a society are other factors that affect the social well-being of an individual. The changes in society greatly influence the personal life of the member. Every change in society brings about changes in personal livings, attitude, and mental set up etc. and thereby physical well-being.

Characteristics of well-adjusted people

How does one assess that a child or an adult is well adjusted and has an integrated personality? The characteristics of people who have a self-acceptant attitude and are well adjusted are:

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1. Ready to take up responsibilities and discharge them according to their age.
2. Enjoy going through experiences of life.
3. Like to accept the responsibilities related to their roles in life.
4. Solve problems that require solution rather than escape them.
5. Taken decisions independently without worrying too much.
6. Like to think before taking a decision.
7. Follow their decisions and choices unless proved wrong.
8. Learn from their mistakes.
9. Do not "day dream" about accomplishments, but derive satisfaction from real achievements.
10. Do not magnify their achievements or successes.
11. Do not combine work and play i.e. while working do not thing of play and while playing do not worry about work.
12. Have the discretion to say 'No' when required and 'Yes' when needed.
13. Got angry at the right cause.
14. Can show affection.
15. Can withstand pain and frustrating situation.
16. When essential, know how to compromise.
17. Difficulties, struggles or failures do not disappoint them to the extent they give up.
18. Can concentrate their energies on a goal that is important.
19. Know how to be happy.

Common danger signals of mal-adjustment

1. Flying into a range at the slightest provocation.
2. Showing signs of excessive worry and anxiety.
3. Frequently appearing depressed.
4. Repeated stealing of small articles.
5. Excessive cruelty to younger or small children or animals.
6. Abnormal anxiety about achieving perfection.
7. Frequent expression of the idea that he/she is punished more than others.
8. Inability to avoid misbehaviour even with repeatedly suffering and punishment.
9. Excessive concern with physical appearance.
10. Habitual lying to suit some purpose.
11. Extreme indecisiveness in making relatively minor choice.
12. Hostility towards any kind of authority.
13. Accident proneness.

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14. Finicky appetite and food fads.
15. Hyper critical and self-righteous.
16. Repeated act of destructions.
17. Talking about or attempting suicide.
18. Running away.
19. Diffuse hyper activity.
20. Teasing and bullying others when feeling rejected.

To avoid psychosomatic illness these suggestions will help you to think sensibly about yourself.

- **First:** Don't be analysing your feelings all the time, looking for trouble.
- **Secondly:** learn to like to work. To get anywhere in this world you have got to work.
- **Third:** have a hobby. A hobby is an important element in getting your mind off work tension.
- **Fourth**: learn to like people. Carrying a grudge can have bad body effects.
- **Fifth**: learn to be satisfied when you can't change the situation
- **Sixth**: learn to accept adversity. In this life you are going to meet some adversity. You may meet a lot but don't let it bowl you over.
- **Seventh**: learn to say the cheerful, humorous thing; never say the mean thing, even if you feel like doing so.
- **Finally**: learn to meet your problems with decision. About the worse thing to do is to have a problem and to mull it over and over in your mind. If you have a problem, decide what you are going to do about it and then stop thinking about it.

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Importance of Good Personal Hygiene

Body Care: Good hygiene practices will help to keep you healthy, give confidence. Those who have low self-esteem under depression frequently ignore personal hygiene which leads to the problem of poor body image.

- **Hand Care**: Hand washing is very important this can avoid a lot of illnesses. Washing hand is very important after using the toilet or before handling food; this can lead to illness. At an embroidery workplace, hand washing is a must to keep the embroidery fabric dust and oil free. It is

mandatory for tailoring workers to wash their hands after their meals to keep the fabric and thread clean while doing stitching.

Fig.6.1: Hand Care

Teeth: A beautiful smile can make a person's day - but bad teeth and breath can create a bad impression, Brush teeth daily with a good toothbrush and toothpaste.

Feet: If feet are restricted in socks and shoes the sweat doesn't 'evaporate' and the skin bacteria will attack to cause pungent 'cheesy' aroma. Washing and drying feet regularly is very important.

- **Jewellery and Loose Items:** No jewellery and loose items is permitted in production areas, so as to avoid tangling of threads and damage of embroidery fabric/motif.
- **Food:** No food is allowed in production areas, lunch area should away from the work area.

- **Cuts/Wounds**: If product, needles or frames become dirty with human blood following measures may be taken:
  - To clean up blood wear gloves;
  - Properly dispose unhygienic product;
  - Sanitize and clean all equipment.

Health and safety precautions for operator if using hand needle

- Keep hands away from the needle as it is very easy to pierce yourself when hand sewing.
- Make sure the right needle and thread are used for the fabric.
- Put the needle at a soft place where you can see it as it is easy to lose. Small children or animals could play with it as it causes injury to self and others and they can eat.
- Avoid getting needle to pierce into skin as may carry germs by use of other people.

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- Keep your work area neat.
- Sharp objects, like needles and scissors keep them with safe place.
- Put all needles and thread in a box after using it.

Activities

Activity 1: Role Play (Personal Hygiene)

Requirements:

1. Students in dirty stinky clothes
2. Some other students around
3. Teacher in charge
4. Classroom basic things like table, chairs, books, machine, pen
5. Some material to spread in the class as litter

Step-by-Step Procedure:

1. The teacher introduces the importance of personal hygiene and the situation of the role play
2. Some students with smelly clothes will enter the classroom and the others will react accordingly
3. Some other students will spread litter in the class
4. The teacher will ask for the response to the above situations
5. Teacher will discuss and explain the need of proper personal hygiene
6. Finally conclusion is generated after discussion with students.

Check Your Progress

A. Fill in the blanks:

1. WHO stands for_____ _____ _____.
2. _____ _____ refers to the complete cleaning of and caring for your body.
3. Washing your hands can _____ the spread of_____ from one person to another.
4. In society, poor personal hygiene is regard as a sign of _____.
5. Smoking causes diseases like, _____ and diseases of the _____ and so should be avoided altogether.

B. Questions:

1. Write importance of personal health and hygiene.
2. Explain factors that affect the maintenance of good health.
3. Describe characteristics of well-adjusted people.
4. Give brief introduction about personal health and hygiene.

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Session 2: Cleaning and Maintenance at Work Place

Cleaning and maintenance at a workplace is of vital importance. It includes keeping the workplace, its structures, furniture, equipment, tools, machines, and facilities in good repair conditions and in proper operating efficiency with proper safety measures. It includes various chores like repairing, replacing, servicing, inspecting and testing. Maintenance should be done department wise for quick and accurate results. Proper maintenance staff is responsible for these maintenance activities in an organization.

Maintenance:

Maintenance is the regular process of keeping machines in its usual operating state so that it can carry on expected performance without causing any lose of time on account of breakdown or accidental harm In other words, maintenance means to keep equipment in the running condition that it can be utilized to its full calculated capacity and efficiency for maximum amount of time.

The responsibility of the maintenance engineers have increased considerably due to ever-growing complexity and size of industrial organization. It has become very important to make effective use of available facilities that have been set up at high investment cost to achieve maximum profit. It is essential to learn the equipment efficiently and this is only possible when the equipment facilities are looked after properly.

Maintenance purpose also includes taking care the safety aspects of certain tools where the failure of the component may cause major accidents. Maintenance is also related with productivity through equipment output and its running cost. Maintenance works raises by equipment performance level and its availability but add to running cost.

There are two major types of maintenance work:

1. **Routine/preventative maintenance** is usually planned. Regular interval and fixed maintenance procedures are very common in general in all organizations. It includes scheduled inspections, repairs and replacement to make sure everything continues to work accurately and smoothly.
2. **Breakdown Maintenance**: The breakdown maintenance is done as per the requirement or crash down of any equipment in an organization.

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Remedial maintenance is needed when break downs takes place which needs immediate action to be taken to get things up and running again.

Maintenance should start with proper planning and on the basis of details given by the maintenance staff. An assessment of all potential risks should be carried out and workers should be engaged in this process. A maintenance plan is a useful tool to begin with, a list of premises, plant and equipment to be maintained should be prepared in a proper manner. The plan should include details of the maintenance to be carried out on each item/product and when it will be carried out. It is very essential to keep records of all the procedures undertaken and note down the changes and amendments needed.

Using Appropriate Equipment

Workers involved in the task of maintenance should have the appropriate tools and equipment to rectify faults in machines and tools, including suitable personal protective equipment in case of accidents. It is essential to make sure one has all of the tools you require before starting the work; many accidents take place when someone decides to manage with an unsuitable item, tool or piece of equipment.

Making Area Safe

Keeping the workplace safe is of prior importance in a textile industry. One may need to restrict right to use the equipment and the area being maintained. The work area needs to be safe by preventing access. Warning signs should be fixed to machinery.

BENEFITS OF MAINTENANCE

A. The Elements of an Effective Cleaning Programme

Dust and Dirt Removal: Vacuum cleaners are apt for clearing light dust and dirt. Industrial processes have special techniques for cleaning walls, ceilings, ledges, machinery.

Mopping wet floors and sweeping decreases the amount of airborne dust. The dust that gets collected in shelves, cupboards and lockers, lights, windows, may need manual cleaning. Special-purpose vacuum cleaners are useful for eliminating harmful stuffs. At some work places lockers are

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provided to employees for storing their personal belongings. Washrooms need to be cleaned once or twice a day.

Maintain Light Fixtures

Dust and dirt on light fixtures decreases light levels. It is very essential to clean the lights regularly as it improves lighting.

Tools and Equipment

Fig 6.2: Tools and equipment

Maintenance of tools is very necessary; it can be stocked in the tool room, appropriate fixtures with marked places needed for tools to give systematic display in the tool room as well as near the work area. They should be put in proper place after use. This decreases the possibility of being misplaced or lost. Supervisors should regularly check, all tools and give damaged tools for repairing.

Waste Disposal

The daily assortment of waste adds to good quality housekeeping practices. Separate waste items that can be recycled. Placing scrap baskets near the areas where waste is produced promotes organized disposal of waste and collection becomes easier. All waste collecting bins should be labelled clearly (e.g., plastic, scrap metal, glass etc.).

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Storage

An organization should have proper space to store material to deal with storage problems and it should be is surely an organized one. The site of the stockpiles should be voluntarily available when needed and not obstruct with work. Stacking cartons should be tied correctly; stored materials should not block stairs, aisles, exits, fire extinguisher. All storage areas should be noticeably marked.

Flammable, toxic and other hazardous materials should be stocked in permitted containers and in selected areas that are suitable for the different hazards that they pose. Storage of materials should meet all provisions specified in the fire codes and the directives of environmental and occupational health and safety agencies in jurisdiction.

B. Benefits of Clean Environment

Good cleaning in an organization has a encouraging outcome on the workers and as well as it creates a good image of the organization. Some of the advantages of keeping a clean environment in an organization are as follows:

1. **Healthy employees = lesser sick days:** Keep workers healthy by keeping work environment clean and will bring in the returns of lesser sick days. And to maintain cleanliness, daily disinfecting of surfaces, washing floors, vacuuming carpets, and sanitizing toilets to minimize the spread. Hand sanitizer wall dispensers help too.

2. **Cleanliness breeds satisfaction:** Cleanliness reflects positivity and lays an overall good image of the workplace when an employee walks into a spotless and lemony fresh smelling area.

3. **Preserves assets over long term:** The expensive items in building, mainly carpets and hard floors should be handled carefully while cleaning. Investing in commercial carpet cleaning equipment or commercial floor scrubbers can make the cleaning procedure more efficient.

4. **Image at stake:** The good will and image of an organization depends on its clean physical and internal environment and neat appearance to all.

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Activities

Activity 1: Role Play (Importance of cleanliness at the workplace)

Requirements:
1. Students to perform the role play
2. Some other students around
3. Teacher in charge
4. Classroom basic things like table, chairs, books, pen, lunch boxes

Step-by-Step Procedure:
1. The teacher introduces the importance of cleanliness at workplace and introduces the topic of role play (like tailor working on sewing machine after lunch without washing hands and the fabric getting stained)
2. Students will play the role of tailor, supervisor and an argument arises between them
3. Teacher will explain the importance of maintaining cleanliness at the workplace
4. Finally, conclusion is generated after discussion with students.

Check Your Progress

A. Fill in the blanks:
1. _____ and _____ at a workplace is of vital importance.
2. _____ signs should be fixed to machinery.
3. _____ and _____ on light fixtures decreases light levels.
4. The daily assortment of _____ adds to good quality housekeeping practices.

B. Questions:
1. Explain term maintenance and types of maintenance.
2. Explain benefits of maintenance at work place.
3. Explain benefits of clean environment of work place.

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Session 3: Cleaning and Maintenance of Specialized Machines

A sewing machine-traditional or modern, new or old, or even the specialized used frequently or rarely will stitch perfectly for many years only if it is handled with lot of care and maintenance. A sewing machine that is properly maintained rarely is out of order. It may require to be mended or a part can be replaced but can be used for longer time.

Regular maintenance of cleaning and oiling is very essential in sewing machines. Generally, these procedures are to be taken care by the technical team in every manufacturing unit but a worker in a tailoring unit must have this basic knowledge to rectify the problems faced on personal level. Each operator should have a handy booklet regarding the details of machine and read it thoroughly before operating machine. Maintenance of the machine is as important as operation of machine to get excellent result.

Each operator should have maintenance kit handy with them. This kit includes items which are useful in maintenance of the sewing machine on regular basis.

The maintenance kit should be inclusive of following items:

- Cleaning cloths
- Fabric to test stitching
- Small crochet hook
- Oil can and lubricant (appropriate for specific machine)
- Screwdriver : small and large
- Hammer
- Nylon cleaning brush
- Pocket knife
- Tweezers
- Newspapers
- Flashlight
- Rubber gloves
- Magnifying glass

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To start first unplug the machine and move it to cleaning area. The floor of the cleaning area should be covered with paper. Whole area should have good light. Keep flash lights also.

Routine maintenance

Dust, lint and thread ends that collect on the working parts of the machine are the main cause of the problems in sewing machine. This big problem can be solved by simple brushing with soft nylon brush each time before operating machine. Lints that cannot be brushed away can be removed by tweezers. Even blowers can be helpful to ensure perfect cleaning. In addition to general cleaning of dusting three areas need special attention: the clutch assembly, the needle bar and presser foot, and the hook and bobbin area.

Chain-stitch machines, electric lock-stitch machines and treadle machines require special maintenance. For that use machine instruction booklet.

Cleaning of sewing machine

Steps to follow:

1. Remove all the parts which are possible to remove in order to clean the machine thoroughly. Keep these parts in order to make it easier to replace them.

Fig. 6.3: Different parts of machine

2. Remove the bobbin case to remove all lint and stray threads. Clean carefully to remove lint using a soft brush. Use tweezers to remove stray threads.

Fig. 6.4: Cleaning of bobbin case

3. In case of specialised attachment used first remove the attachments.

4. Pull a piece of cloth soaked in solvent back and forth between the discs of upper tension screw to clean it.

5. Remove lint from the face plate area using a soft brush. For grease use a cloth dipped in solvent. Place a drop or two of oil on moving parts where they slide.

Fig. 6.5: Cleaning of face plate area

6. Wheel area. Loosen screw in the face of the locknut in order to remove the clutch and wheel. If the machine is driven by an external belt, this belt will have to be removed before the wheel will come off. Gear-driven machines will have a gear on the inside of the wheel.

After cleaning of above parts reassemble it. If the clutch fails to operate, remove the locknut again and turn the washer one half turn (180°) and reassemble. Plug the machine only after it is dry completely. For reassembling keep the booklets provided by the manufacturer handy and follow the diagram given there.

With button hole or other specialized equipment, cleaning of the machine should not be done with compressed air but with a soft bristle brush.

Oiling of Sewing Machine

Before oiling ensure that machine is completely dry. To avoid the oil stains in a garment, on the basis of advance technology the sewing machines are divided into the following categories:

1. Sewing machine with lubrication
2. Semi dry head sewing machine
3. Dry head sewing machine

Before starting with the oiling check the category out of the above three where your machine falls and then select the procedure.

Sewing machine with lubrication

In this machine the thread take-up and needle bar parts are lubricated with the least amount of needed oil. For the hook section, the standard method of oiling is used.

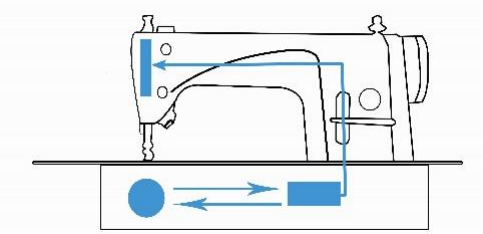

Fig.6.6: Sewing machine with lubrication

Semi dry head sewing machine

Oil free frame has been developed. It is supplied with not only a high-speed sewing capability, but also a protection feature for avoiding oil stains.

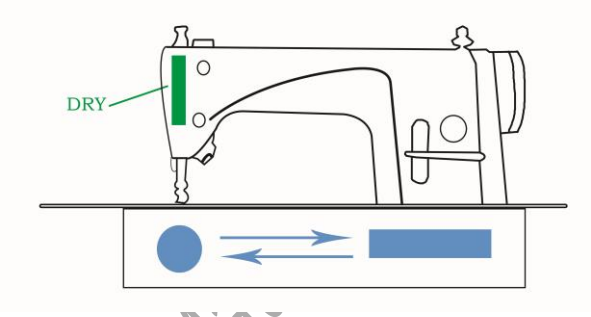

Fig.6.7: Oiling of semi dry head sewing machine

Dry head sewing machine

The dry-head type machine ensures ease of use by completely preventing the oil from staining the material while it is being stitched. The machine completely adds to the improved quality of finished products.

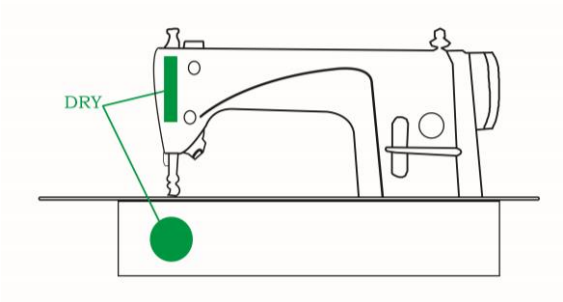

Fig.6.8: Oiling of dry head sewing machine

The part near the needle bar, the thread take-up lever and the hook are not oiled in case of these machines.

Place one or two drops of oil in all holes designated by the instruction booklet. Even if you do not use your machine often, oil it regularly.

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Care of the Motor

Make sure to see that all electric connections to the motor control and motor are fixed. If the covering of cord is in poor condition, cover it with good-quality electrical tape or replace the new cord. The belt that joins the motor to the hand wheel should have sufficient tension to maintain it from slipping.

If this has become unevenly damaged, causing unnecessary vibration, replace driving wheel with a new one. Good care should be taken of the rubber wheel on motors that forces machines by rubbing make contact with the hand wheel. Maintain the hand wheel clean and dry so the machine will run with a least amount of vibration.

Points to be taken care

1. Do not plug the machine in until all the cleaning fluid is dry.
2. Check the machine instruction booklet to know the type and place of oil lubricant to use.
3. Do not oil machines with nylon or graphite-impregnated bronze bearings or with oil impregnated in the bearing casings.
4. Do not oil the tension discs, the hand wheel release, or the belts and rubber rings on any machine.
5. Use the lubricant recommended for your machine for best results.
6. Check to be sure each screw and part is in the correct location.

Maintenance check list

Check that

1. Machines are being kept clean.
2. It is lubricated regularly.
3. Air system is regulated properly
4. It has humidity dryers, filters and lubricators in the air lines for compressed air system.
5. Rusted areas which develop due to excessive moisture in production area are taken care.
6. No wear is on critical moving parts
7. Critical screws are set in properly.
8. Condition of mechanics is proper.
9. Machine is completely dry before oiling.
10. Each screw and part is in the correct location.

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Activities

Activity 1: Practice oiling and cleaning of the sewing machine in class/lab and prepare a chart on steps of oiling the machine.

Material Required:
1. Rough cloth
2. Oil
3. Sewing machine
4. Cleaning brush
5. Pens, pencil, eraser, markers
6. Chart sheet
7. Cleaning solvents
8. Tweezers

Step by step Procedure:
1. Take the cleaning material and clean the machine. (Follow the instructions as mentioned in the session above)
2. Oil the machine properly.
3. Clean the extra oil and check the stitch of the machine on rough cloth.
4. Clean some small threads in the bobbin case or in the feed arm using the brushes or tweezers.
5. Write down the steps of oiling the sewing machine on a chart sheet.
6. Place the chart in classroom or lab.

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Check Your Progress

A. Fill in the Blanks:
1. Upper and lower _____ must be balanced to produce a perfect stitch.
2. Cleaning of sewing machine is classified as general machine cleaning and _____ machine cleaning.

B. Questions:
1. Explain cleaning of sewing machine.
2. Explain oiling of sewing machine.
3. Explain maintenance of motor used for sewing machine.

ANSWER KEY

MODULE – 1

Session 1:

Fill in the blanks

1. Line
2. Tailors
3. Large number

Session 2:

A. words maze

B. Correct sequence of processes/steps:

1. Crotch attaching-back
2. Zip attachment
3. Pocket making
4. Pocket Finishing
5. Loop making and joining on belt
6. Belt attachment
7. Bottom hemming
8. Front & Back side panel attaching

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MODULE – 2

Session 1:

A. Fill in the blanks:
1. Double needle
2. Hemming
3. Tex
4. 9000
5. Machine embroidery

B. Match the column:
1. b
2. c
3. a
4. e
5. d

Session 2:

A. Match the column:
1. d
2. c
3. e
4. a
5. b

MODULE – 3

Session 1:

A. Fill in the blanks:
1. Back tack
2. Fingers
3. Stitches per Centimetres
4. Shoes

Session 2:

A. Fill in the blanks:
1. Knives
2. Knit
3. Stretch
4. Thread Guide

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MODULE – 4

Session 1:

A. Fill in the blanks:
1. Zigzag
2. Chenille

Session 2:

A. Fill in the blanks:
1. Lock stitch
2. Elastic
3. Medium

MODULE – 5

Session 1:

A. Fill in the blacks:
1. Cross
2. Setting
3. Shank
4. Hopper Head

Session 2:

A. Fill in the blacks:
1. 10000, 15000
2. Spool pin
3. Heavier, lighter

MODULE – 6

Session 1:

A. Fill in the blacks:
1. World Health Organisation
2. Personal Hygiene
3. Prevent, germs
4. Illness
5. Cancer, Lungs

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Session 2:

A. Fill in the blacks:

1. Cleaning, maintenance
2. Warning
3. Dust, dirt
4. Waste

Session 3:

A. Fill in the blacks:

1. Threads
2. Specified

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