



Government of Karnataka

APPARELS MADE UPS & HOME FURNISHING

Job Role : Sewing Machine Operator

TEXT BOOK



9th Standard

National Skill Qualification Framework

NSQF LEVEL 1

**Samagra Shikshana Karnataka
and
Karnataka Text Book Society (R.)**

FOREWORD

All Education commissions recommend bringing work and education into the domain of the curricular, infusing it in all areas of learning while giving it an identity of its own at relevant stages. It explains that work, transforms knowledge into experience and generates important personal and social values such as self-reliance, creativity and cooperation. Through work one learns to find one's place in the society. Work involves interaction with material or other people (mostly both), thus creating a deeper comprehension and increased practical knowledge of natural substances and social relationships.

Through work and education, school knowledge can be easily linked to learners' life outside the school. All the previous Education commissions emphasized on Vocational Education and Training (VET) for all those children who wish to acquire additional skills and/or seek livelihood through vocational education after either discontinuing or completing their school education. VET is expected to provide a 'preferred and dignified' choice rather than a terminal or 'last-resort' option. NCERT has attempted to infuse work across the subject areas and also contributed in the development of the National Skill Qualification Framework (NSQF) for the country, which was notified on 27 December 2013.

It is a quality assurance framework that organizes all qualifications according to levels of knowledge, skills and attitude. These levels, graded from one to ten, are defined in terms of learning outcomes, which the learner must possess regardless of whether they are obtained through formal, non-formal or informal learning. The NSQF sets common principles and guidelines for a nationally recognized qualification system covering Schools, Vocational Education and Training Institutions, Technical Education Institutions, Colleges and Universities. It is under this backdrop that Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), Bhopal, a constituent of NCERT has developed learning outcomes based modular curricula for the vocational subjects from Classes IX to XII. This has been developed under the Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education of the Ministry of Education

This textbook has been developed as per the learning outcomes based curriculum, keeping in view the National Occupational Standards (NOS) for the job role and to promote experiential learning related to the vocation. This will enable the students to acquire necessary skills, knowledge and attitude.

These text books from PSSCIVE were vetted by a team of subject experts and resource persons in the context of setting a state specific content to ensure more relevancy to the world outside the school.

CHAIRMAN NOTE:

In a rapidly evolving world, the importance of vocational education has never been more pronounced. As industries adapt to new technologies and changing market demands, the need for skilled professionals who are equipped with practical knowledge and hands on experience becomes critical. The series of vocational text books aims to bridge the gap between theoretical concepts and real world application, providing learners with the tools they need to succeed in their chosen fields.

Each text book in this series has been meticulously crafted to align with industry standards and best practices. By combining foundational knowledge with practical skills we aim to empower among students to not only understand their disciplines but also to excel in them. Our contributors are experienced educators, Industry professions and subject matter experts have collaborated to ensure that the content is both relevant and engaging.

The structure of each book is designed to facilitate effective learning among students. All Key points are presented in a clear and concise manner, complemented by real life case studies, practical exercises and assessments that encourage critical thinking and problem-solving. We believe that learning is most effective when students can see the direct application of their studies in Professional settings.

We also recognize the diverse backgrounds and learning styles of our students. To that end, we have included a variety of teaching tools, including visual aids, Interactive elements, and online resources, to support a more personalized learning experience. Our goal is to make vocational education accessible and engaging for all learners, regardless of their starting point.

As you embark on this educational journey we encourage you to approach these text books with an open mind and a willingness to explore new ideas. The skills and knowledge you gain will not only prepare you for immediate employment but will also serve as a foundation for lifelong learning and professional development.

We extend our gratitude to all those who contributed to this text books, and we hope that these textbooks will inspire and equip the next generation of skilled professionals.

Welcome to the future of Vocational Education.

ABOUT THE BOOK

Apparel, Made-ups and Home Furnishing sector is amongst the fastest growing sectors in our country. It covers a great number of activities starting from the transformation of raw material fibers, yarns, fabrics into garments and end with fashion apparel. This sector includes activities related to designing, drafting, cutting, stitching, finishing and decoration of apparel, made-ups and home furnishing products. It also includes how to check the quality of raw materials, merchandising and export aspects. One of the very important areas of this sector is Sewing Machine Operation.

Sewing machine operations broadly involve stitching of fabrics and other pliable materials using a sewing machine. The major responsibility of a Sewing Machine Operator is to stitch various parts of a garment or any other article. Generally, Sewing Machine Operators are specialized in a specific type of sewing machine. These Operators usually begin by performing simple tasks, and with experience, they can perform more difficult tasks with advanced Industrial Sewing Machines. Sewing machine operation is one of the very important steps in the process of construction, and the quality of apparel, made-ups and home furnishing. Hence, the area has wide scope of manpower requirement, and there is a huge demand of trained personnel.

The Text book for the job role of Sewing Machine Operator is developed to impart knowledge, Skills, Entrepreneurship through hands-on-learning which forms a part of the experiential learning. The Textbook has been developed with the contribution of the expertise from the subject and industry experts and academicians for making it a useful and inspiring teaching-learning resource material for the student. The job role of the students is to acquire necessary knowledge and skills to become a learner.

The textbook describes the preparation and operation of the sewing machine, construction of various types of stitches, seams and edge finishes and surface embellishments through various techniques are covered. The commonly occurring hazards in apparel Industry and their safety measures for the workers are explained in the textbook. In all the levels the students are trained on Professional Skill, Knowledge and Employability Skill related to the job role as Sewing operator.

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CONTENTS

LEVEL 1

Module Name	Page No
Unit 1: Basic Hand Stitches	01
Session 1: Various Types of Hand Stitches	02
Unit 2: Introduction to Sewing Machine	10
Session 1: Sewing Machine and its Types	11
Session 2: Various Parts of a Sewing Machine and its Attachments	20
Unit 3: Sewing Tools and Sewing Machine Operations	31
Session 1: Measuring and Marking Tools and their Usage	33
Session 2: Cutting Tools and Usage	41
Session 3: Needles and Sewing Threads	48
Session 4: Preparation and Operation of Sewing Machine	56
Unit 4: Part A: Seams and Seam Finishes	68
Session 1: Different Type of Seams	70
Session 2: Seam Finishes	78
Part B: Care and Maintenance of Sewing Machine and Hazards	82
Session 1: Cleaning, oiling and Handling of Sewing Machine	83
Session 2: Sewing Defects and its Solutions	90
Session 3: Hazards and safety Measures in Sewing Industry	97
Unit 5: Home Furnishing	103
Session 1: Household Linens Classification and Its Types	103
Glossary	108

UNIT -1 Basic Hand Stitches

Session	Topic	Outcomes
1	Various Types of Hand Stitches	At the end of the lesson, the students will be able to: ► Identify what are the basic hand stitches. ► Sew the basic hand stitches. ► Realising the importance of the basic hand stitches. ► Basic stitching fabric together permanently by hand. ► Able to create products using basic embroidery stitches. ► To introduce students to create art of embroidery.

SESSION 1:

VARIOUS TYPES OF HAND STITCHES

STITCHES



This session will help provide the student with a through understanding of the various kinds of stitch.

A stitch may be defined as one unit of conformation resulting from one or more strands or loops of thread interloping, or passing into or through the material. Interloping is the passing of a loop of thread through another loop formed by the same thread, while interloping is the passing of a loop of thread through another loop formed by a different thread.

Almost every garment or other stitched articles we sew,needs some hand stitches. Thus, we should be able to handle the needle and thread to carry out hand stitches competently. Before learning stitching on the sewing machine,one should learn the basic hand stitches which are very commonly used in the manufacturing of garments and other articles.

The basic and stitches are divided into two types depending on their use

Constructive stitches

It is a line made by a portion of sewing thread passed over and under an equal or unequal number of threads for construction purpose. Such stitches can be classified as temporary and permanent stitches.

1. Temporary stitches

Such stitches are used to hold the garment or fabric pieces together before permanent stitches are made. These stitches are also known as tacking or basting stitches. Usually this stitch is horizontal and it is worked from the right to the left-side with a knot.

Various kind of tacking/basting stitches are as follows.

(i) Evenbasting

It is used to hold the fabric together temporarily, but more securely than in uneven basting. Make even stitches of about $\frac{1}{4}$ inch to $\frac{3}{8}$ inch long. When easing one layer of the fabric to another layer, hold the layer to be ease on top and gather this top layer to stitch (Fig. 1.1).

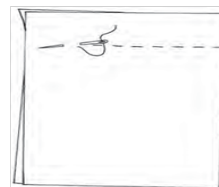


Fig.1.1: Even basting



Fig.1.2:Uneven basting

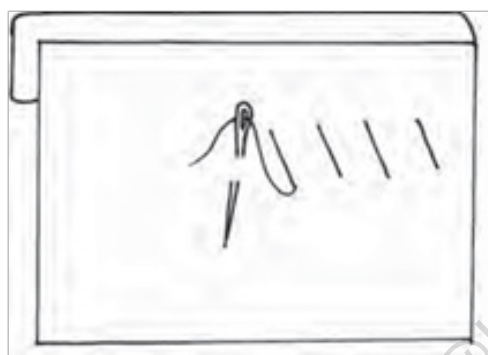


Fig.1.3:Diagonalbasting



Fig.1.4:Slip basting

(ii) Unevenbasting

This is used to mark or to hold fabrics together, only where there is no strain on the stitches. Use this type of basting, as the guideline on the upper side of the fabric is at least twice than that on the under side of the fabric. Make a long stitch, about $\frac{1}{2}$ inch on one side of the fabric and then a short stitch $\frac{1}{4}$ inch on the other side of the fabric(Fig.1.2).

(iii) Diagonal basting

This is used to hold two pieces of fabric together when more than one row of tacking is required. For example,when you are attaching interfacing to a collar or mounting a fabric on to an underlining, etc. It may bed on vertically or horizontally(Fig.1.3).

(iv) Slipbasting

Also called invisible hand bast ing,it is used when working from the right side of the fabric, and to mark fitting alteration or on occasions where patterns have to be joined accurately. For example, strips, checks, etc. Turn under one edge of the material on these line. Pin the folded edge carefully to the seamline on the other edge with pins at right angles to the seam.

2. Permanent stitches

The stitches that form a part of the stitched garment are called permanent stitches.

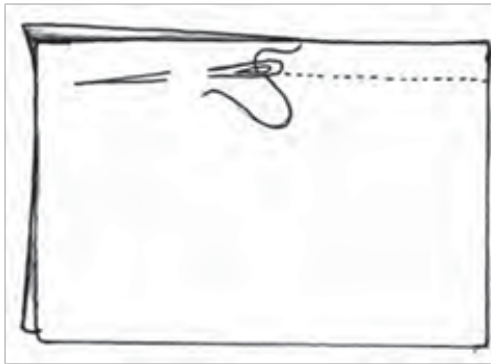


Fig.1.5:Runningstitch

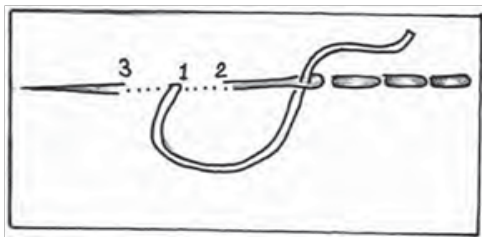


Fig.1.6:Backstitch

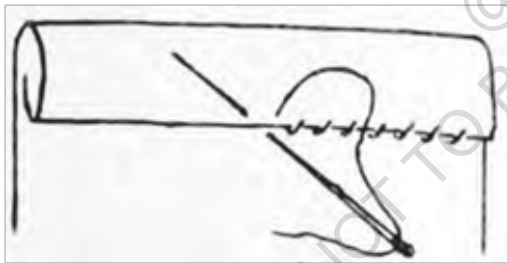


Fig.1.7:Hemstitch

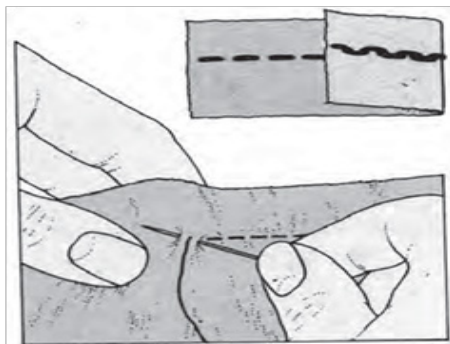


Fig.1.8:Halfbackstitch

(i) Runningstitch

This is the simplest form of hand stitch which is used mainly for gathering and shirring fabrics. When it is used for both gathering and shirring, make sure that enough thread should be left to make an unbroken line of stitches. It is similar to the even basting, but the stitches are much smaller. The stitches should be straight, fine and evenly spaced and mostly about

1/16 inch to 1/8 inch in length. To carry out the running stitch, take several very small stitches onto the point of the needle before drawing the thread through the fabric. The stitches should be as small as the thickness of the fabric to allow less than 2mm on fine fabrics (Fig.1.5).

(ii) Backstitch

It is considered to be very strong and is many times used as a substitute for machine stitching. It is mainly applied when extra strength is needed. Back stitch is very use ful for making strong seams and for finishing off a line of stitching. The stitches on the front of the work are small and appear continuous. To work the back stitch, make a small stitch back from left to right. Then make a double length stitch forward on the wrong side of the fabric. So the needle emerges a stitch's length in front of the first one. Repeat this way, keeping the stitches uniform in size and fairly firm (Fig.1.6).

(iii) Run and back or combination stitch

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

(iv) Hemstitch

It is used for hems on medium weight or light weight fabrics. It is mainly used to fasten a wedge which should be turned in or to flatten a seam. It appears as small slanting stitches on the wrong side of the fabric. The stitch size will depend on the fabric. The thread should not be pulled out or the fabric will pucker (Fig. 1.7).

(v) Halfbackstitch

This stitch is quite similar to the back stitch, but with a longer stitch at the back side of the fabric. To carry out the stitch, make a small stitch back from left to right and then make a stitch forwards, two and a half times as long, on the wrong side of the work. Make another small stitch from left or right on the right side.

(vi) Oversewing

It is used to finish seam edges on fabrics which fray easily. To carry out the stitch, hold the fabric with the edge to be worked away from the worker. Insert the needle $\frac{1}{8}$ to $\frac{1}{4}$ inch from the edge, and bring the thread over the edge of the fabric. Make the next stitch $\frac{1}{4}$ inch further on.

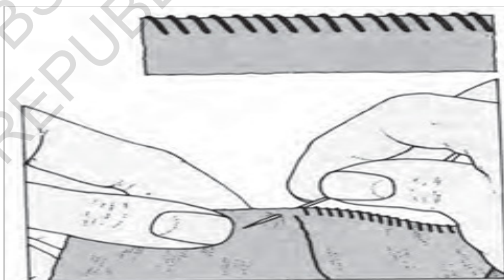


Fig. 1.9: Oversewing stitch

(vi) Blind hemming stitch

This stitch is worked on the inside fold of the hem so that the stitches are almost invisible; thus, the name 'blind'. The thread should not be pulled tightly. To carry out the stitch, hold the work with the fold of the hem towards you, take a very small stitch inside the hemfold edge, picking up a thread of the single fabric on the point of the needle before taking another stitch on the inside hem fold of the garment.

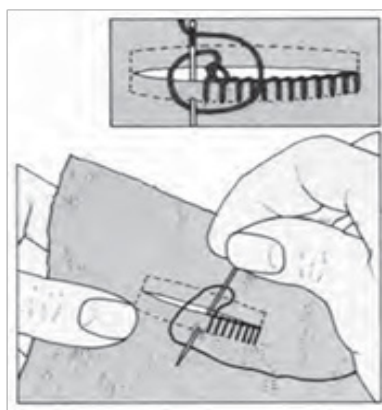


Fig. 1.10: Buttonhole Stitch

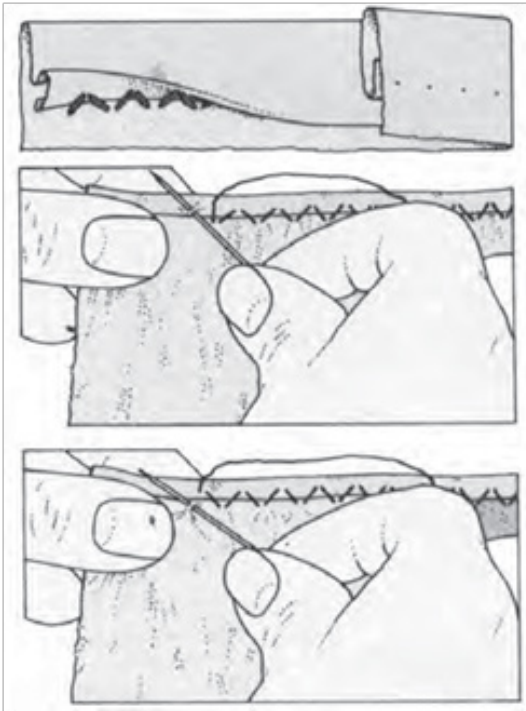


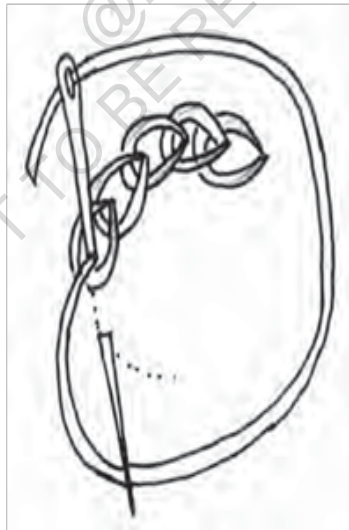
Fig.1.11

Decorative stitches

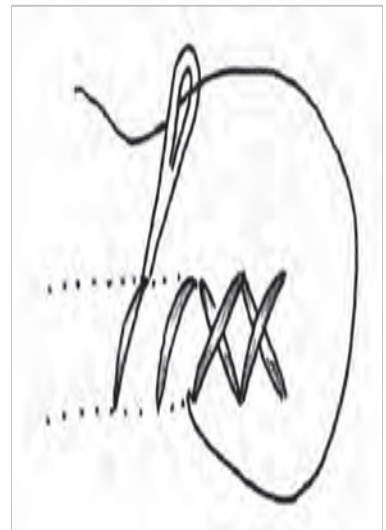
These stitches are also known as embroidery stitches. This art is practiced on all kinds of pliable material with different types of threads, precious and semi-precious stones, pearls, shells, beads, etc. There is different kind of hand embroidery stitches. Some of the common hand embroidery stitches are stemstitch, chain stitch, herring bone stitch, feather stitch, lazy-daisy, satin stitch, cross stitch, Bullion stitch, etc., which are used to decorate garments, home furnishing items and other articles. As these stitches are mainly used to decorate the garment or material, shown in figure a to i (Figs1.12)



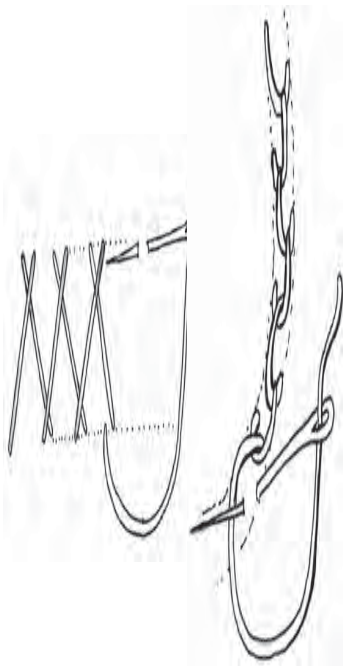
(a) Stemstitch



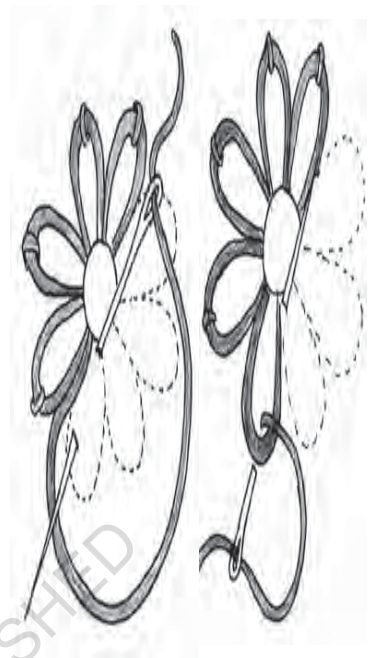
(b) Chain stitch



(c) Cross stitch

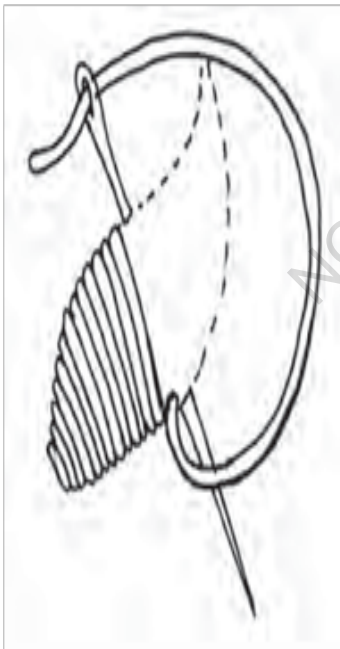


(d) Herring bone stitch

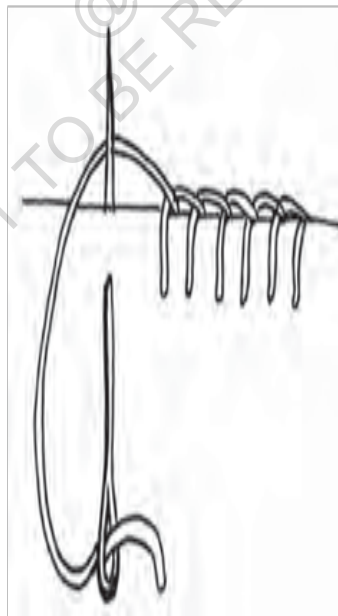


(e) Feather stitch

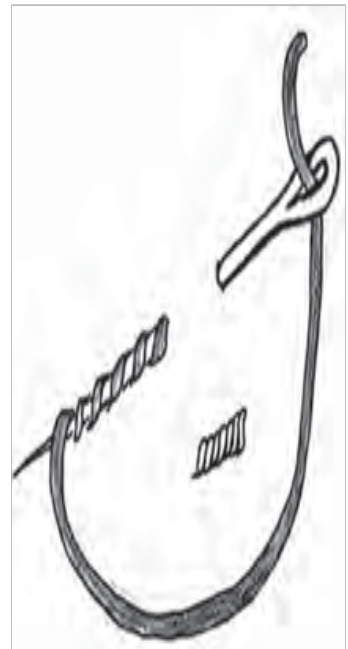
(f) Lazy-daisy stitch



(g) Satin stitch



(h) Blanket stitch



(i) Bullion stitch

Fig.1.12

Practical Exercises

Activity 1

Make a scrap book of the constructive and decorative stitches and label them.

Material Required

1. Coloured pens/pencils
2. Scrap book
3. Pictures of constructive and decorative stitches
4. Scissors
5. Adhesive/glue

Procedure

1. Search and collect the pictures of different types of constructive and decorative stitches.
2. Cut the pictures very neatly with scissors.
3. Paste the min a scrap book.
4. Label them.

Activity 2

Prepare samples of hand stitches as given in this session.

Material Required

1. Cotton fabric to prepare samples (12"x12")
2. Needle
3. Thread
4. Frame
5. Pen
6. Pencil
7. Eraser
8. A3-sized chart sheet
9. Glue
10. Markers/coloured pens

Check Your Progress

A. Choose the correct answers

1. Stitch forms part of a stitched garment.
 - (a) Temporary
 - (b) Permanent
 - (c) Constructive
 - (d) Hem
2. Stitch is of equal length about $\frac{1}{4}$ inches on both sides of the fabric.
 - (a) Uneven basting
 - (b) Slip basting
 - (c) Diagonal basting
 - (d) Even basting
3. Stitch is used for hems on medium or light weight fabrics.
 - (a) Hem
 - (b) Back
 - (c) Run and back
 - (d) Decorative

B. One word question and answers

1. Write short notes on the following
 - (a) Decorative stitches
 - (b) Button hole stitch

C. Long Answer

1. Describe how to create temporary stitches.
2. Describe how to create permanent stitches.

Reference link:

- <https://egyankosh.ac.in/bitstream/123456789/61439/3/Unit-6.pdf>
- <https://www.masterclass.com/articles/types-of-hand-sewing-stitches>

UNIT -2 Introduction to Sewing Machine

Session	Topic	Outcomes
1	Sewing Machine and its Types	At the end of the lesson, the students will be able to: ▶ Classify sewing machines ▶ Identify the different uses of each sewing machine ▶ History of sewing machines. ▶ Differentiate the different types of sewing machine according to its function ▶ Help each other on group activity
2	Various Parts of a Sewing Machine and its Attachment	At the end of the lesson, the students will be able to: ▶ Students will be able to name parts of the sewing machine and describe the function. ▶ Differentiate the different types of sewing machine attachments according to its function. ▶ Help each other on group activity ▶ Classify sewing machines parts and its attachments

SESSION 1:

SEWING MACHINE AND ITS TYPES



Introduction to sewing machine

A sewing machine is used to sew fabric and materials together with thread. Sewing machines were invented during the first Industrial Revolution to decrease the amount of manual sewing work performed in clothing companies. Since the invention of the first sewing machine was invented by the Englishman Thomas Saint in 1790. Since its invention, it has greatly improved the efficiency and productivity of the fabric, garment and needle industries.

A sewing machine controls the fabric with feeding devices and forms a perfect stitch to join the fabrics. It has various parts and attachments, each of which has their own importance and uses. Sewing can be broadly classified in two categories hand sewing and machine sewing. Hand sewing may be used for temporary purposes it may be used for some special purposes like hemming, buttonhole making, blanket stitch, etc.

The basic thought behind sewing machines is to mechanically stitch two or more pieces of material or fabric, together using thread and needle. Sewing machines reduce the amount of manual sewing in preparing a garment or any other article. Sewing machines help the operator in getting the work done quicker, with greater accuracy and much more consistently.

Evolution of the sewing machine

The sewing machine device was invented in 1790 by English inventor, Thomas Saint, but he could not advertise his invention. He designed a wooden awl to make holes in leather and canvas, thus allowing a needle and single piece of thread through to hook underneath, and forming locked chain stitches. Josef Madersperger began developing the sewing machine in 1807 and he presented the working machine in 1814.

John Greenough patented the first sewing machine in the United States in 1842. Elias Howe created a sewing machine in 1845.

The sewing machine's recognition quickly spread over a world, initially selling to clothing manufacturers so that they could construct standardised clothing sizes on a larger scale. In 1860s, there was a quick popularity of these machines in the middle class section. Later in 1889, the machines run by electricity were designed with motors fixed in them.

At first, the sewer standard machines with a motor strapped on the side. As with the expansion of the power in houses, these became more popular and the motor was gradually introduced into the casing. Later innovations include the ability to make more sophisticated stitching patterns. In the twenty-first century, sewing machine companies have manufactured several type of machines used for different sewing techniques and there are also computerised machines, embroidery machines and special purpose machines manufactured.

The latest machines have LCD screens, microprocessors, and pre-programed fonts.

Categories of sewing machine

The following are the main categories of sewing machine.

Domestic sewing machines

These are designed mainly for one person to sew individual dresses while using a single stitch type. Modern sewing machines are designed in such a way that the fabric easily glides in and out of the sewing machine, speeding the stitching process and saving time and energy.

Some key points for domestic sewing machines are as follows.

1. Domestic sewing machines are usually used in homes by people simply interested in sewing.
2. These are commonly used by people in a variety of projects for dress making, and for stitching simple home furnishing items.
3. With little changes, these machines can perform a variety of stitch types.

Domestic sewing machines usually work on light weight fabrics or piece work.

4. These machine run on significantly smaller motors compared to that of the industrial sewing machines.

Industrial sewing machines

1. Industrial sewing machines are a heavy-duty version of a standard basic sewing machine, and it is used in garment and other related industries.

2. Industrial sewing machines are used for mass production.



Fig.2.1: Operators working on industrial machines

3. These are heavy-duty machines that work thousands stitches per minute.
4. An industrial machine is well equipped with a clutch and large servo motor.
5. Industrial machines are mainly designed to perform one single specific function in assembly-line based factories.
6. Some industrial machines are designed to operate heavier than normal material.
7. Mainly, mass production requires an industrial sewing machine, which is designed to sew heavy material speedily, such as leather, canvas, and vinyl, at one time.
8. The industrial machines are named based on the function that they serve. Typical names for industrial machine class include pocket setter, button hole, and programmable pattern sewers, etc. For instance, a pocket industrial machine can sew 2,000 pockets in an eight-hour production cycle.
9. Programmable machines can store 10–30 or more patterns in the memory.
10. Special purpose industrial machines can give better output in production, for example, button hole machines, pocket setter, pattern sewer.

Industrial sewing machines are larger, faster, more complex, and more varied in their size, price and task.

The following are the comparison between domestic and industrial sewing machines:

1. The industrial machine is faster, stitching from 3000–6000 stitches per minute, while the fastest domestic sewing machine stitches not more than 1500 stitches per minute.
2. The presser foot (Seen Session 3) on a power machine is raised and lowered with a knee lift to a special foot pedal. On domestic machines, it is generally operated manually using a lever at the back of the needle bar.
3. Lubrication is done automatically in industrial sewing machines where as it is done manually in domestic sewing machines.

Types of sewing machine

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

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

1. Mechanical sewing machines

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

Hand-operated sewing machine



Fig.2.2: A hand-operated sewing machine

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

(ii) A handle is attached to the fly wheel (Seen Session 3) which is detachable and is used to operate the machine.

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

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



Fig.2.3:Treadle sewing machine

Treadle sewing machine

- (i) This machine is the same as a hand-operated sewing machine but it is operated by feet, with an additional stand attached to the machine.
- (ii) A belt is attached to the lower stand passing through the balance wheel and driven by feet.
- (iii) These machines run faster than the hand-operated sewing machine.

- (iv) This machine is also suitable for the places where there is no electric supply.
- (v) When handling the treadle sewing machine, both the hands of the Operator are free to handle the fabric. Hence, this speeds up the work of sewing.

2. Electronic sewing machine

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

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

3. Computerised sewing machines

- (i) These sewing machines are very fast and specific to use.
- (ii) These machines are similar to the electronic sewing machines. However, a computerised sewing machine works with the help of various software's.
- (iii) Computerised sewing machines allow the Operator to tailor the functions according to the sewing needs. A computerised sewing machine functions are very appropriately in designing and stitching various components of

the garment like sleeves, yokes, pockets, etc. These advanced computerised machines have an LED display or LCD display or touch screen. They are multi-function machines and are expensive.

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

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



Fig.2.4: Lock stitch machine



Fig.2.5: Chain stitch machine



Fig.2.6: Double chain stitch machine



Fig.2.7: Button hole machine



Fig.2.8:Button stitch machine



Fig.2.9:Bar-tack machine



Fig.2.10:Feed offarmmachine



Fig.2.11:Over-lock machine



Fig.2.12:Blind stitch machine

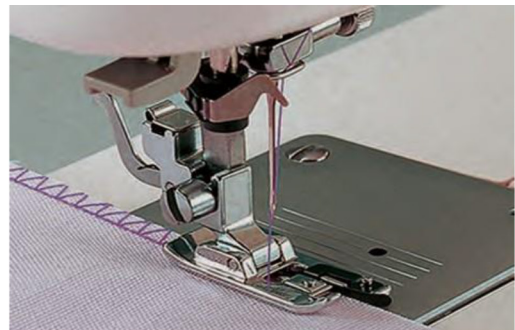


Fig.2.13:Over-edge machine

Practical Exercises

Activity 1

Prepare a chart of the different type of sewing machines.

Material Required

1. Chart sheet
2. Pictures of sewing machines
3. Adhesive/glue
4. Scissors
5. Coloured pens/pencils

Procedure

1. Search and collect the pictures of different type of sewing machines.
2. Cut the pictures very neatly with scissors.
3. Paste them on a chart sheet.
4. Label them.
5. Place the chart in the classroom/practical lab.

Activity 2

Visit the garment manufacturing industry/local distributors of sewing machines/boutiques/workshops/units of garment construction and designing.

Materials Required

1. Notebook
2. Pen
3. Camera (if available/ mobile phone with camera)
4. Vehicle (bus) for field visit

Procedure

1. Visit a garment manufacturing industry/local distributors of sewing machines/ boutiques/workshops/units of garment making and designing with your teacher.

-
2. Observe the different parts and attachments of a sewing machine and its functions.
 3. List the type of sewing machines used and write about their functions.
 4. Prepare a report of the field visit.

Check Your Progress

A. Fill in the blanks

1. Sewing machines are those usually used in homes by people simply interested in sewing.
2. A sewing machine works with the help of various softwares.
3. Sewing machines use a single motor that supplies power to the needle.

B. Answer the following questions

1. Enlist the different type of sewing machines.

2. Write short notes on:

- (a) Electronic sewing machines
 - (b) Computerised sewing machines
3. Write the difference between a domestic and industrial sewing machine.

C. Long answer

1. Write down the different categories of sewing machine.
2. Explain mechanical sewing machines in detail.

Reference link:

- <https://ncert.nic.in/vocational/pdf/ivsm101.pdf>
- <https://www.scribd.com/document/473046301/Different-Types-of-Sewing-Machine-docx>

SESSION 2: VARIOUS PARTS OF A SEWING MACHINE AND ITS ATTACHMENTS

Introduction

The basic structure of the mechanical sewing machines is the same-whether it is a hand-operated sewing machine, treadle sewing machine or motorized sewing machine.

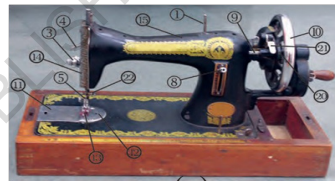
Sewing machine: parts and their functions

The basic parts of a sewing machine are:

1. Spool pin is a metal rod placed on the top of the machine for correct positioning of the reel of thread.
2. Thread guide takes the thread from the spoolpin to the needle through a small hole. It holds the thread in position from the spool to the needle. It smoothen the thread and protects it from abrasion.

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

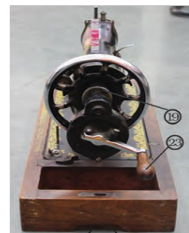
4. Thread take-up lever is a lever fitted to the body of the arm located above the tension disc. It receives its up and down motion from the front axle. At the outside end of the lever, there is a small hole through which the thread passes. The take-up lever first loosens the top thread during the stitch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



(a)



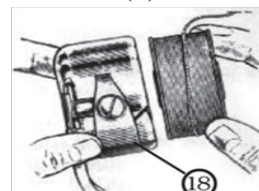
(b)



(c)



(e)



(18)

-
5. Needle bar is a metal rod to hold the needle at one end with the help of a clamp. Its main function is to give motion to the needle.
 6. Presser foot is a detachable device for holding the material in place on the feed dog while stitching. This device is not used when attachments for tucks, ruffles or embroidery are used.
 7. Presser foot lifter is the lever attached to the presser bar (located inside the face plate) to control the up and down movement of the presser foot. It must always be lifted up to take out the material from the machine.
 8. Stitch regulator controls the length of the stitch.
 9. Bobbin winder is a device which helps in winding the bobbin (located inside the slide plate) properly. The thread passes through it tightly or loosely, as desired.
 10. Fly wheel (or balance wheel) is around wheel located at the upper right of the sewing machine. This is made to revolve the machine. It controls the motion of the machine manually or electrically.
 11. Slide plate is a rectangular plate, which facilitates the removal of the bobbin case without lifting the machine top.
 12. Needle plate or throat plate is a semi-circular disc with a hole to allow the needle to pass through it. The fundamental purpose of this plate is to provide a leveled surface for the material and to prevent the dust from entering the inner parts of these wing machine.
 13. Feed dog consists of a set of teeth fitted below the needle plate. When the machine is in motion, the feed moves upwards, thus advancing the material as each stitch is made. It helps to move the material forward while sewing.
 14. Face plate is a cover, which when removed, gives access to the oiling points on the needle bar, presser bar and take-up lever.
 15. Arm is a horizontal part of the head that houses the drive shafts.
 16. Check spring is a small wire spring behind or at the top of the tension disc. It provides a little amount of tension on the thread of the needle and acts a shock absorber.
 17. Slack thread regulator is a metal hook near the tension discs.

-
18. Bobbin case is fixed in the shuttle case placed in the bottom chamber (the hollow space under the slide plate) of the sewing machine and moves into position to catch the top thread and form the stitch as the needle is lowered into the bobbin case. The lower tension of the thread can be adjusted (by loosening or by tightening) by a small screw fixed on the bobbin case. (Fig 2.15)
 19. Clutch or thumb screw is in the center of the flywheel and it engages and disengages the stitching mechanism.
 20. Rubber ring is a ring on the bobbin winder which comes in contact with the nut of the balance wheel. This should never be allowed to become oily, as it will make it slippery and will not be able to make proper contact with the balance wheel.

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

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

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



Fig 2.15: shuttle and shuttle case

24. Shuttle holds the bobbin case and moves to form the loop as the machine is operated. It is fitted below the feed dog or to its left side.
25. Treadle drive is a large wheel located under the board in the treadle machine. It is connected to the balance wheel with a leather belt. As it rotates, the power is transmitted to the balance wheel by the leather belt.
26. Treadle is the foot rest at the base of the treadle machine which is pressed with the feet to operate the treadle machine.
27. Pressure regulating screw is the screw above the presser bar, which can be tightened to increase the pressure on the fabric when stitching with fine/light weight fabric and loosened to accommodate thick fabric.

Sewing machine : Attachments and their functions

Different machines have separate attachments for different sewing processes such as hemming, gathering, etc., but they operate differently on various types of machines. The details of attachments are mostly given in the manual provided with the machine. Students may discuss with the teacher and according to the availability of the sewing machine and attachments, they can practice on it. Some common sewing attachments are given here.

Blind hem foot

It is an additional attachment basically used for edge finishing of various apparels like trousers and skirts, and home furnishing items like curtains, etc. (Fig.2.16).



Fig.2.16:Blind hem foot

Braiding foot

It allows lot of flexibility while attaching elastic cord, braid or cord (Fig.2.17).



Fig.2.17: Braiding foot

Button fixing foot

It can attach two-holed buttons and four-holed buttons to the material or garment. In this machine, the foot holds the button in place and then attaches the button to the fabric using zigzag stitch (Fig.2.18).



Fig.2.18:Button fixing foot

Buttonholefoot

It is used for preparing precise button holes or binding the raw edges. These attachments are complicated to use on straight stitch machines. In such cases, it is advisable to hand sew the button holes. One sewing machine, the button hole attachment produces a simple button hole stitch by swinging the needle from side to side. Insert the attachment by removing the presser foot and putting the button hole attachment in its place (Fig.2.19).



Fig.2.19:Buttonholefoot

Circular sewing attachment

It allows the operator to stitch in a circular pattern using straight stitch, zigzag stitch and any decorative stitches. Circles mostly up to 26cm in diameter are stitched perfectly using this popular attachment, which is very essential for craft and decorative work. This is suitable for most top loading machines (Fig.2.20).

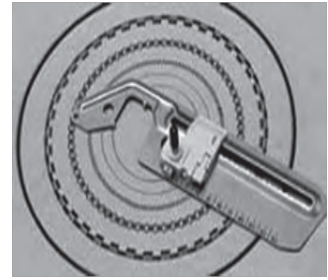


Fig.2.20: Circular sewing attachment

Cording foot

To attach decorative cords and threads, a cording foot is attached to the machine. This foot is designed for stitching closed to a raised edge. It is used for applying cord to the seam (Fig.2.21)

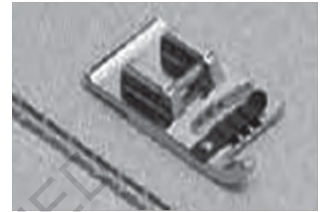


Fig.2.21: Cording foot

Decorative tape foot

This attachment is used to fix trimmings and ribbons on the fabric (Fig.2.22).



Fig.2.22: Decorative tape foot

Gathering foot

It is attached to create gathers on a fabric with high speed and precision to create perfect ruffles. This attachment gathers the fabric as it is stitched with fullness locked in every stitch (Fig.2.23)



Fig.2.23: Gathering foot

Zigzag foot

It is attached to create designs in fabric using zigzag stitches of different widths (Fig.2.24).

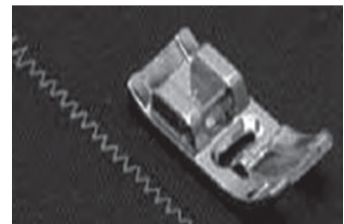


Fig.2.24: Zigzag foot

Hemmer foot

It works on the sleek and small edges of fabrics as it automatically curls using either a straight stitch or decorative stitch at the hem lines. It works for hems which are too small to do by hand. It is best suitable for light weight fabrics. Hemmers make hems from three-sixteenths of an inch to seven-eighths of an inch wide, right on the machine. This attachment means hours saved from hand turning and basting. The hem is turned by the hemmer, and at the same time the line of stitching is guided close to the edge of the hem (Fig.2.25).

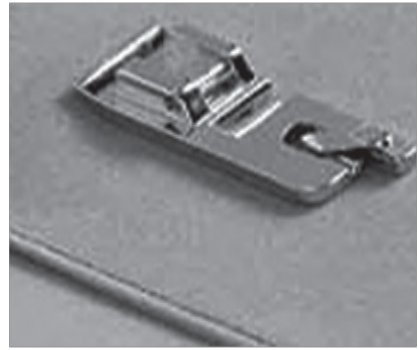


Fig.2.25: Hemmer foot

Overcasting foot

It delivers an accurate and consistent overcasting stitch where the thread is locked around the edge of the fabric and aligned with it to prevent the fabric from raveling (Fig.2.26).



Fig.2.26: Overcasting foot

Ruffling foot

It easily makes and attaches ruffles on different types of fabric and finishes the fabric edges. This attachment is capable of taking gathered or pleated frills, and will take and apply frills to an other section at the same time. It is useful in making children's clothes and curtains. It is one of the most important attachments of sewing machine, and reflects a great deal of credit upon the inventors of these remarkable time-and-money-saving bits of steel. The method of using this attachment varies with different machines (Fig.2.27).



Fig.2.27: Ruffling foot

Zipper foot

It is the footer used for attaching mainly.

Zips and snap tape. Zipper foot has an arrow toe foot which gives more precision and visibility. The foot needs to be adjusted to right or left to stitch both sides of the zip. This foot also attaches decorative cording and piping. There are two kinds of zip foot attachment : one with an adjustable foot, the other with a non-adjustable foot (Fig.2.28).

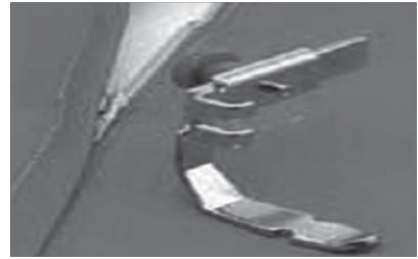


Fig.2.28: Zipper foot

Elastic foot

It helps in attaching elastic to the fabric and provides even tension every time to avoid pulling and tugging on the needle (Fig.2.29).



Fig.2.29: Elastic foot

Embroidery foot

It is suitable for shirring fabric. Its design allows the elastic thread to pass easily under the presser foot. On sewing machines, the elastic is couched on to the fabric. The thread is fed through the presser foot hole and pulled gently. The more it is pulled, the more the fabric gathers. On a straight stitch machine, the elastic is wound around the bobbin (Fig.2.30).



Fig.2.30: Embroidery foot

Over lock foot

It is useful for producing a durable finish on seams which fray easily or are bulky. It is suitable for use on a sewing machine and is most effective when the fabric is positioned under the presser foot so that the stitches form slightly over the fabric edge. A metal bar holds the edge in place to make sure that the stitches are set correctly. Test that you have the correct positioning and stitch width before you start to sew. Fig.2.31 shows the attachment of overlock foot. It can be attached to the sewing machine.

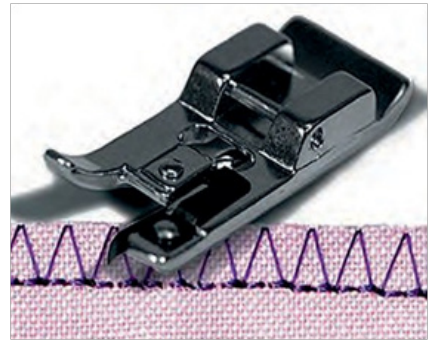


Fig.2.31: Overlock foot

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Practical Exercises

Activity 1

Draw the sewing machine and label its different parts.

Material Required

1. Pencil
2. Sharpener
3. Eraser
4. Practical file
5. Ruler

Procedure

1. Draw a diagram of these wing machine in the practical file.
2. Label the different parts of the sewing machine.

Activity 2

Visit a sewing machine shop/boutique/workshop/garment manufacturing unit. Study the machines and their attachments used. Prepare a report on the parts, attachments and their functions.

Material Required

1. Notebook
2. Pen
3. Camera (if available/mobile phones with camera)
4. Vehicle (bus) for field visit

Procedure

1. Visit the local sewing machine shop/boutique/workshop/garment manufacturing unit with the teacher and study different types of machine and its latest developments.
2. Identify the different parts of the sewing machine and explain its functions.
3. Identify the sewing machine attachments.

-
-
4. Write down the types of sewing machine used in shop/boutique/workshop/ garment manufacturing units and write about its parts, functions and operations.
 5. Prepare a report of the field visit using photos and materials collected from the site

Check Your Progress

B. Choose the correct answers .

1. _____ is a metal rod to hold the needle at one end with the help of a clamp.
 - (a) Thumb screw
 - (b) Bobbin winder
 - (c) Face plate
 - (d) Needle bar
2. Consists of a set of teeth fitted below the needle plate.
 - (a) Face plate
 - (b) Elastic foot
 - (c) Feed dog
 - (d) Fly wheel
3. Sewing foot delivers a consistent and accurate over casting stitch around the edge of the fabric
 - (a) Ruffling
 - (b) Overcasting
 - (c) Cording
 - (d) Zipper
4. The function of the clutch is to _____.
 - (a) engage stitch mechanism
 - (b) raise presser foot
 - (c) control the speed of the machine
 - (d) feed the thread to the needle

B. Fill in the blanks

1. _____ is the handle attachment of the sewing machine.
2. _____ is flexibility while attaching elastic cord.
3. The _____ foot is used for attaching zips and taps.

C. One word question and answers.

1. Write down the functions of the slide plate and feed dog.
2. Differentiate between a bobbin winder and bobbin case.
3. Explain the function of hemmer foot and zipperfoot.
4. Enlist any five sewing machine attachments.

D. Answer the following questions.

1. Mention the internal and external parts of sewing machine.
2. Write the function of balance wheel.
3. Write short notes on:
 - (a) Button fixing foot
 - (b) Overcasting foot

E. Long answer questions.

1. Write down the different parts of a sewing machine and their functions in detail.
2. Write down the functions of any five sewing machine attachments.

Reference link

- <https://www.scribd.com/document/520084617/1-2-Sewing-Machine-and-Special-Attachments>
- Button attaching machine: Button attaching

UNIT -3 Sewing Tools and Sewing Machine Operations

Session	Topic	Outcomes
1	Measuring and Marking Tools and their Usage	At the end of the lesson, the students will be able to: ▶ Classify the different tools in sewing. ▶ Use of sewing tools and equipment properly. ▶ Classify them according to their use and functions. ▶ Identify sewing tools and equipment.
2	Cutting Tools and Usage	At the end of the lesson, the students will be able to: ▶ Classify the different cutting tools in sewing. ▶ Use of sewing tools and equipment properly. ▶ Classify them according to their use and functions. ▶ Classify cutting tools according to their uses.
3	Needles and Sewing Threads	At the end of the lesson, the students will be able to: ▶ Classify the different Needles and Threads in sewing. ▶ Selecting the Right needle and Thread in sewing. ▶ Hand needle and machine needle identify, ▶ Learning how to choose the right needle and thread for different Fabrics.

4	Preparation and Operation of Sewing Machine	At the end of the lesson, the students will be able to: ▶ How to preparation of single needle sewing machine ▶ Understand the basic operation of sewing machines.
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SESSION 1: MEASURING AND MARKING TOOLS AND THEIR USAGE



A Sewing Machine Operator must have knowledge of the various measuring and marking tools as to enable one to stitch garment that fits well.

INTRODUCTION

The process of garment making mainly includes the knowledge and skills of measuring, marking, cutting and stitching, which is done using appropriate tools. Different tools and equipment of measuring, marking and cutting have their own utility and importance.

The selection of needles, threads and fabric based on suitability is important for good quality production. If ignored, it may lead to many defects.

A Sewing Machine Operator should know how to make preparations before stitching. For example, one must be aware about fixing the sewing needle, threading, adjusting thread tension, checking of stitch formation, etc.

Measuring tools

It is important to take accurate measurements to stitch a well-fitted garment or any article. Proper selection of measuring tools is essential for taking the accurate measurements of the body. Accurate measurements are needed for making correct pattern to ensure proper fitting of the garment.

Different type of measuring tools which help to do the job properly are as follows.

Measuring tape

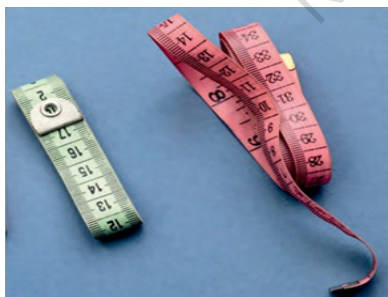


Fig.3.1: Measuring tape

It is a metal tipped cotton or plastic tape to take measurements. Generally, the size of a measuring tape is $\frac{1}{2}$ inch to $\frac{1}{4}$ inch wide, 60 inches long and has $\frac{1}{8}$ divisions (Fig.3.1). A to need, it has a small metal cover and at the other end of the tape, there is a metal strip of about 3 inches long attached to take measurements from points like round chest, round waist and length of the garment, etc.

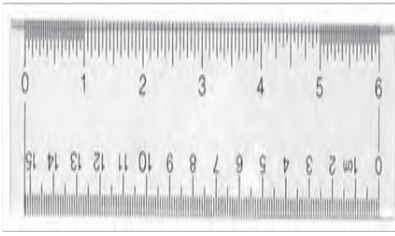


Fig.3.2:Ruler

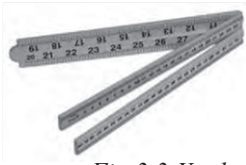


Fig.3.3:Yardstick

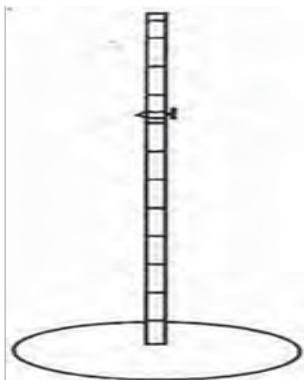


Fig.3.5:Hemorskirtmarker

Ruler

It is made up of plastic, metal or wood. It is better to have two rulers—one being 1 inch wide and 6 inches long, and the other one being 2 inches wide and 18 inches long. The 18-inch ruler is with $\frac{1}{8}$ inch grid. A ruler is convenient form of ensuring small measurements. A transparent ruler is used to draw straight lines or bias lines.(Fig 3.2)

Yardstick

It is a straight edge tool used to physically measure the lengths up to a yard. It is a flat wooden tool with markings at regular intervals (Fig. 3.3). Yard sticks are very useful to draw long seam lines on paper or fabric.

L-square

It is an L-shaped wooden or metal ruler, the long arm of which measures 24 inches and the short arm measures 14' inches. The L-square has a perfect right-angled corner and it is used to draw the lines at right angles while making drafts. It is very useful during the process of straightening the fabric to check whether the corners of the fabric have got a right-angled structure. (Fig.3.4)

Hem or skirt marker

It is used to mark the hem length accurately. It is adjustable and is used as a measuring guide for marking width for various sections of the garment like pleats, hems, seam allowances, etc., accurately using notches provided at regular intervals along the gauge (Fig.3.5).



Fig.3.6: French curves

French curves

It is a template made of plastic, wood or metal composed of different curves. It is used in making drafts to draw smooth curves of varying radii. The French curve is placed on the material and a pencil is traced around its curves to produce the required curves. In garment making, French curves are mainly used for pattern drafting, pattern alteration and for shaping the armhole and neckline (Fig. 3.6). The transparent, light and unbreakable plastic material is most commonly used in French curves.

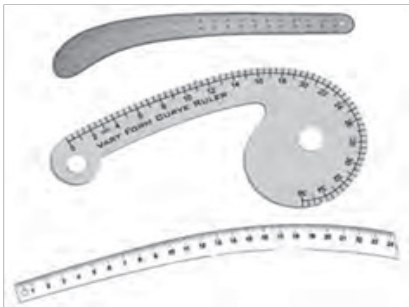


Fig.3.7: Vary form curve

Vary form curve

It is the most accepted contour ruler. It is basically an elongated French curve. This tool is used by pattern makers, graphic artists, illustrators, etc., to sketch smooth curved lines. The vary form curve draws a wide variety of curves by turning smoothly. They are especially helpful to the pattern makers for drawing more defined curves of the neckline, collar design, sleeve caps, pocket contour, armhole, elbow, skirt, trousers, or when a specific contour is required (Fig.3.7).



Fig.3.8: Sewing gauge

Seam or sewing gauge

It is a small 6-inch metal ruler that has a sliding distance indicator. It has inch markings on one edge and centimeters on the other edge. It can take exact Measurements of small portions such a, pleats, and buttons, or for other alterations (Fig. 3.8). This is a useful tool for detail designing and forms all repetitive designs.

Marking tools

The printed symbols and markings on the patterns must be transferred to the fabric to accurately match these arms and position of pockets, folds, button holes, darts, tucks and pleats. The object is to create precise marks that do not remain permanently or stain the fabric, but are visible during construction.



Fig.3.9: Tracing wheel

Tracing wheel

It helps in marking the measurements and pattern on the wrong side of the fabric using tracing paper. Tracing wheels are available in two styles, one with small serrated edge which is appropriate for most fabrics, and another, with a smooth edge used on fine or knit fabrics to avoid snagging of the arms. The tracing method is to keep the first layer of the right side of the fabric facing the ground, the second layer is that of the tracing paper, and the third layer is a paper pattern on which the tracing wheel is moved to transfer the markings.(Fig 3.9)



Fig.3.10: Tracing paper

Tracing papers and sheets

A tracing paper is used with the tracing wheel/pen/pencil to transfer pattern markings to the wrong side of the fabric (Fig.3.10). Care must be taken when choosing from the wide range of available colours, since most varieties produce a mark that remains in the fabric until it has been laundered.



Fig.3.11: Tailor's chalk

Tailor's chalk

It is made of coloured powder that is used to transfer markings on to the fabric. The tailor's chalk is available in assorted colours and in different shapes, mainly rectangular and triangle. It is also available in the form of a pencil (Fig.3.11).

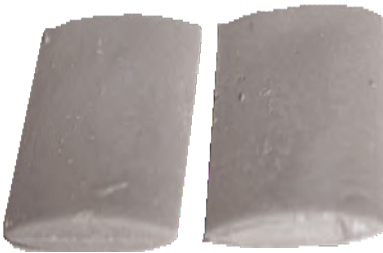


Fig.3.12: Tailor's wax

Tailor's wax

It has a consistency like that of a crayon. It is especially suitable for use on wool or worsted materials. It is available in a wide range of colours that is, white, yellow, red, blue, black and fluorescent green, etc. The marks it produces can only be removed from the fabric with heat or laundering. Thus, it is advisable to test the tailor's wax on a small scrap of fabric before using it on the right side of the material (Fig..3.12).



*Fig.3.13: Fabric-marking pens
(air erasable, water soluble)*

Fabric-marking pens

Such pens are air erasable or water soluble. These are specifically used for marking designs. After tracing the design, the colour can last for a long time but disappears completely at once when damped with water (Fig.3.13). Air-erasable pens are especially used for dress making, shoe making, handicraft, embroidery, etc., for the temporary marking. After drawing, the colour evaporates after 2 to 10 days. Sew the garments shortly after marking, or seal the marked fabric in a plastic bag with the air squeezed out. The marks with a cotton swab soaked in alcohol.



Fig.3.14: Pins

Pins

Dress making pins are mainly made of stainless steel or brass and are sized from 10 to 32. Size 17 is the general purpose dress maker's pin, but there are several special varieties that can be useful (Fig.3.14). Its main function is to hold the paper or fabric in position during marking, cutting and stitching. The correct selection of pins for the specific fabric (based on the size and material of the pin) is important as a wrong pin used may create a defect in the fabric.

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Practical Exercises

Activity 1

Draw the marking tools in the practical file (any four).

Material Required

1. Pen/pencil
2. Practical file
3. Sharpener
4. Eraser
5. Ruler

Procedure

1. Draw neatly and correctly, any four marking tools with the help of a pencil and ruler.
2. Label them.

Activity 2

Prepare each part of the measuring tools. Material Required.

1. Chart paper
2. Pictures of measuring tools
3. Scissors
4. Adhesive/glue

Procedure

1. Search and collect pictures of the measuring tools from the Internet, books, etc.
2. Cut the pictures neatly.
3. Paste the pictures on a chart paper and label them.
4. Place the chart paper in the classroom / practical lab.

Check Your Progress

A. Choose the correct answers

1. The measuring tape measure _____ inches.
A) 70" B) 50" C) 60" D) 59"
2. It is made of _____ that is used to transfer marking on the fabric.
A) Chalk pieces B) Color wax C) Colour powder D) Markers

-
3. It is a small _____ inch metal ruler that has a sliding distance indicator.
A) 6" B) 7" C) 8" D) 5"

B. Fill in the blanks.

1. Tailor's chalk is made of, used to transfer markings on to the fabric.
2. The available varieties of fabric-marking pens are _____ and _____.
3. The short arm of the L-square measures 14 inches and the long arm measures _____.
4. A curve is a template made out of metal, wood or plastic composed of many different curves.
5. Helps in marking the measurements and pattern on the wrong side of the fabric using the tracing paper.

C. One word Question and Answers.

- 1) What is measuring tools?
- 2) Write the uses of French curve.
- 3) Write the difference between tailor's wax and tailor's chalk.

D. Answer the following questions.

1. Explain the measuring tools in detail
2. Explain the marking tools and uses in detail.
3. Write a short note on:
 - a) Tracing wheel
 - b) Measuring tape
 - c) Tailor's chalk
4. List out the marking tool and measuring tools.

E. Long Answers

1. Explain the various measuring tools and its uses.
2. Explain the various marking tools and its uses.

Reference link

- <https://www.scribd.com/document/402049258/Measuring-Tools>
- <https://ncert.nic.in/vocational/pdf/ivsm102.pdf>

SESSION 2:

CUTTING TOOLS AND USAGE

The selection of cutting tools according to the fabric is important before starting the cutting process. While selecting the cutting tools, the quality of tools is very important that is, the quality of metal used strength /hardness of blades, its weight and its plating, etc.

Cutting tools

Some of the important cutting tools that a Sewing Machine Operator must be aware about are listed below.

Bent-handled shears

These shears are available commonly with 7 or 8 inch blades (Fig. 3.15). The bent handle allows the fabric to lie smooth and straight when it is being cut, thus yielding better control over the cutting edge. These scissors are available in right-handed or left – handed styles.

These scissors are used to cut fabrics only

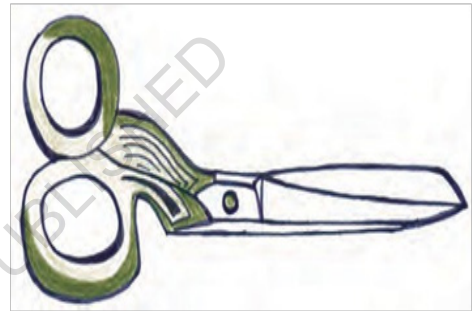


Fig.3.15: Bent-handled shears

Scissors

These are the main tool for cutting fabric. Scissors have sharp, pointed and slender blades, used for cutting of different materials. These scissors are mostly 3 to 10 inches long in size. These have round handles for both the blades. Specific fabric-cutting scissors should not be used for cutting of heavy material as it may reduce the sharpness of the blades. (Fig 3.16)

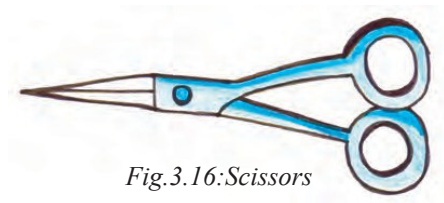


Fig.3.16:Scissors

Pinking shears

These shears are generally 9 to 10 inches long (Fig. 3.17). It is useful in finishing raw edges of fabric or to produce a decorative edge. It is one of the best shears for edge finishing of various type of fabrics, which do not ravel too badly. It creates a clean zigzag cut line of any fabric/material or garments. Pinking shears produce a notched cutting line (zigzag) to give a neat look to the inside of the garment and also prevent raveling.

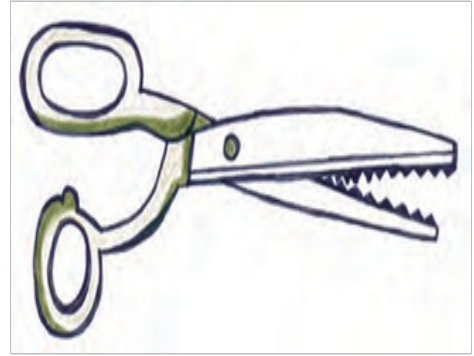


Fig.3.17: Pinking shears

Embroidery scissors

These scissors are small, usually 4–5 inches in length with very sharp blades, used for all-purpose needle work, ripping and for making button holes (Fig.3.18).

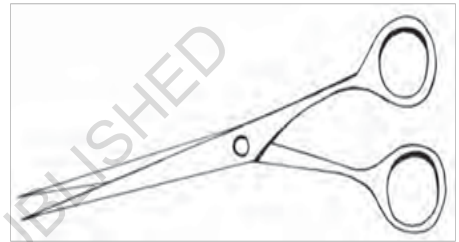


Fig.3.18: Embroidery scissors

Button hole scissors

These scissors have notched blades (Fig. 3.19). They are useful if one needs to make many button holes. These scissors have a bolt and lock nut which is adjusted to cut a button hole of any length up to 1.5 inches.

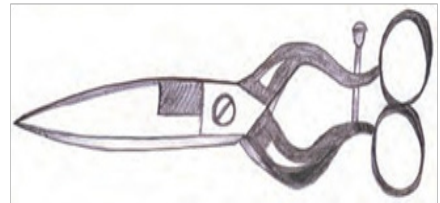


Fig.3.19: Button hole scissors

Electronic scissors

These scissors are used mostly in the industry. It can cut thin and heavy fabric (Fig. 3.20). It is appropriate for cutting silk, nylon, soft and hard-to-cut fabric. The back side of scissors is like a battery in which the cells are fitted. The scissors move when the button is pressed.

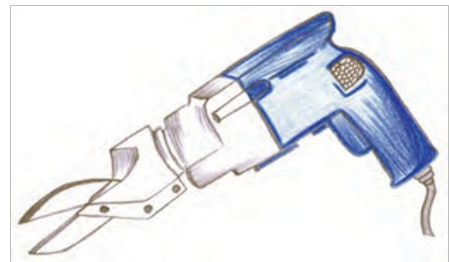


Fig.3.20: Electronic scissors

Straight knife

It is a cutting machine basically used for cutting fabrics with perfect edges. This machine has a base plate and an upright stand to hold the vertical blade. A straight knife consists of a motor to transfer the complete assembly to another position. The straight knife operator's efforts are affected by the weight, motor and the base plate movement of the machine. Straight knife are available with large variety of sizes and blade speeds in the market. It is widely used in the garment industry.(Fig 3.21)



Fig.3.21:Straight knife

Round knife

It has a base plate with an electric motor placed above it, with a handle to direct the blade for cutting as per the requirement. It is used for fabric cutting in garment factories. Though it is not used as commonly as the straight knife cutting machine, but it is used for some specific purpose like cutting single ply as well as multi-layer. It is very suitable for gentle curve line cutting. This is used to cut the larger part of the garment. (Fig 3.22)



Fig.3.22:Round knife

Seam ripper

It is a simple pen-like device that allows the removal of machine or hand stitched seams by cutting the stitches in an accurate and safe manner. A seam ripper is the best equipment to rip or open seams (Fig. 3.23). While removing the stitches, the fabric should not be pulled as it can stretch and easily tear the fabric.

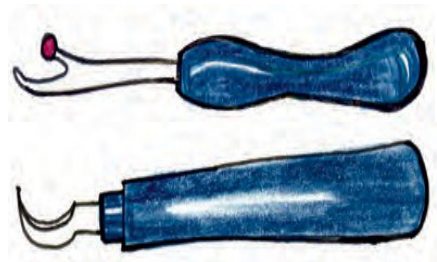


Fig.3.23:Seam ripper

Thread cutter

It is a small handy spring loaded tool, specifically used for cutting extra threads on the garments and ripping seams (Fig.3.24). Threads are simply cut by pushing the upper bladed own with the thumb.



Fig. 3.24: Thread cutter

Cutting table

It is a large, flat table used to spread the fabric and patterns while marking, pinning, and cutting (Fig.3.25). They are often covered with thick felt, which allows the pins to be placed into the surface.



Fig.3.25: Cutting table

Notcher

It is a tool commonly used in pattern making and sewing. It creates notches in the paper pattern or material. By notching, one marks the balance points of the pattern and also seam allowance, centerlines, ease, dart in take, etc. (Fig. 3.26). Notches are used to align the pattern pieces.

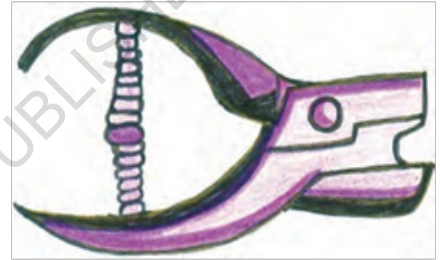


Fig.3.26: Notcher

Pressing Tool

Iron

Pressing is an essential part of sewing. Every seam should be pressed as soon as it has been sewn, to give a clear, crisp line to the seam. Your pressing iron should be capable of both dry and steam ironing. A spray attachment is useful for dry ironing. An ordinary domestic iron is essential for general pressing; a steam iron is useful for light weight fabrics. Pressing cloths are most important. Use cheese cloth for light weight fabrics and cotton or linen for heavier fabrics. (Fig 3.27)



Fig.3.27: Iron

Practical Exercises

Activity1

Draw any five cutting tools in the practical file.

Material Required

1. Practicalfile
2. Pencil
3. Eraser
4. Sharpener
5. Ruler

Procedure

1. Draw any five cutting tools in your practical file with the help of a pencil and ruler.
2. Label them.

Activity2

Prepare a chart of the cutting tools.

Material Required

1. Chart paper
2. Pencil
3. Scissors
4. Ruler
5. Books/magazines
6. Pictures of cutting tools
7. Adhesive/glue

Procedure

1. Search and collect pictures of cutting tools from books, magazines or the Internet.
2. Cut the pictures neatly with scissors and paste on the chart paper.
3. Label them.
4. Place the chart in the classroom/practicallab.

Check Your Progress

A. Choose the correct answers.

1. The shears are generally _____ and _____ inches long useful blades.
A) 9-10 B) 10-12 C) 12-14 D) 8-10
2. _____ is the pen like device that allows removing stitches from fabric.
A) Seam ripper B) Thread cutter C) Scissors D) Notcher
3. _____ is the important tool for pattern cutting.
A) Shears B) Scissors C) Pinking shears D) All of the above

B. Fill in the blanks

1. _____ are used to align pattern pieces.
2. _____ is used to rip or open seams.
3. _____ shears are useful in finishing raw edges of fabric or to produce a decorative edge.
4. _____ is a small tool specifically used for cutting extra threads.
5. _____ is the cutting table is mostly covered with, which allows the pins to be placed into the surface.
6. _____ is the main tool for cutting fabric.

C. One word Question and Answers.

1. What is cutting tools?
2. What is Notcher?
3. What is the function of seam ripper?

D. Answer the following questions.

1. Explain the cutting tools in detail.
2. Enlist the types of cutting tools.
3. Write the difference between shears and scissors.

E. Long Answers.

1. Make a list of cutting tools and give their uses.

2. Write short notes on the following:

- (a) Pinking shears
- (b) Seam ripper
- (c) Cutting table

Reference link

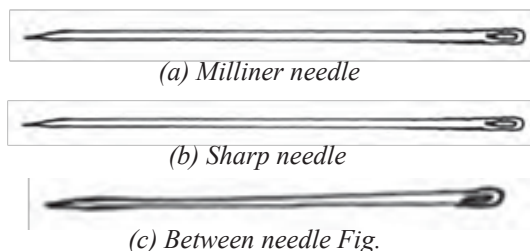
- <https://ncert.nic.in/vocational/pdf/ivsm102.pdf>
- <https://www.sewingmachinesplus.com/sewblog/9-cutting-tools-sewing-room/?srsltid=AfmBOoqj1HuiNTBDmMfabfT7o5LlcZLM2DH-j3Le-pGxnaXfC6AL7pTBj>

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SESSION 3: NEEDLES AND SEWING THREADS

There are various types of needles and threads available in the market. It is important to select a suitable needle, thread and miscellaneous tools for sewing.

Hand sewing needles



3.28 (a,b,c): Hand Sewing needles

These needles are used for hand sewing work or embroidery. The needle design varies according to the purpose. Sharps of medium length can be used on most fabric weights; between are smaller, allowing them to make fine stitches. Use long Milliner's needles for tacking. Needles are mostly available in different sizes from the very small size 9 to the heavy size 18 as shown in Fig.(3.28) (a,b,c). The selection of hand sewing needle depends on the work to be done and the type of fabric. For hand sewing, medium length needles with a short oval eye are selected where as, for embroidery work, crewel needles with a long oval eye are selected. The hand sewing needle has three parts—the eye, stem and point.

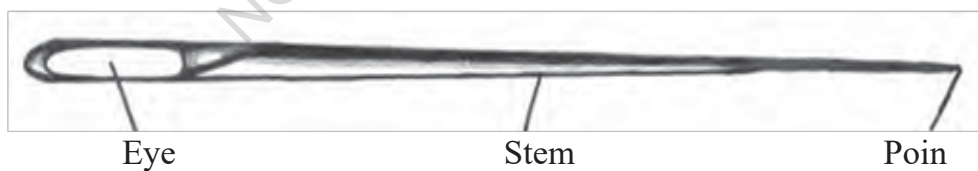


Fig.3.28:Parts of a hand sewing needle

Sewing machine needles

In the garment industry, there are several types of sewing machine, each required different type of needles. Each manufacturer of the needle identifies its needles in a different way; and needles for the same type of system may have several different names or numbers, depending on the manufacturer.

Though the sewing machine needles are of various types, they may be selected according to its application. The size of the needles mainly depends on the structure and type of fabric, and sewing threads. Machine sewing needles (Fig.3.29) are mostly available from sizes 9 to 18. The different type of needles is made to fit on specific sewing machines and specific models. The needle sizes should match with the weight, thickness, and kind of the fabric.

If the needle is very fine, it will abrade the thread; bend, break, affect the loop formation and cause skipped stitches. If it is too coarse, it will damage the fabric, producing attractive seam, and causing the seam to pucker. The different parts of a sewing machine needle are as follows.

Butt

It is a small pyramid at the upper end of the shank. It is designed to make a single point contact with the hole in the needle bar [seen 3.29 (a,b)].

Shank

The upper end of the needle that is held in the needle bar by the needle screw is the shank. The shank is usually round, but it can have one or two flat sides. Designed to support and stabilize the needle blade, the diameter of the shank is mostly larger than the diameter of the blade.

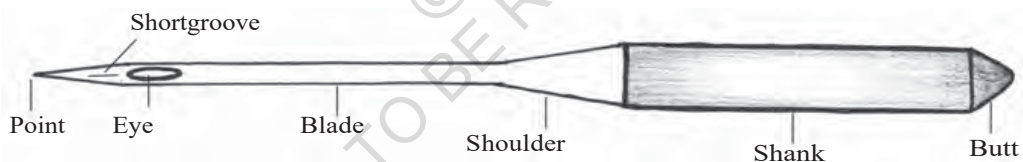


Fig.3.29(a) A sewing machine needle

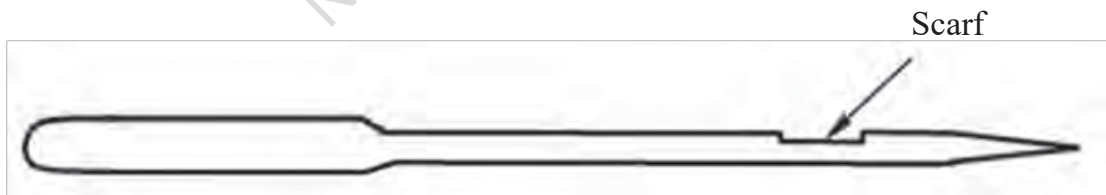


Fig.3.29(a) A sewing machine needle

Shoulder

It is the beginning of the shank just above the needle blade.

Blade

It is the thin section of the sewing needle that extends from the shank to the eye. It can be easily bent and hence, should be examined regularly for its straightening.

Scarf

It is a small indentation above the eye that permits the hook to pick up the thread loop. On some needles, the scarf is elongated and/or deeper to ensure that the needle thread loop will be large enough to prevent the skipped stitches.

Short groove

It is placed in the side of the needle where the hook or looper is placed. It is a small groove between the tip and the needle eye. Short groove helps the sewing thread to create a loop.

Eye

It is an opening in the needle blade at the lower end of the long groove. It carries the thread into the fabric to the hook or looper to make a stitch. The size of an eye is proportional to the diameter of the blade.

Point

It is the tapered end of the needle and is often considered the most critical part of the needle. Mostly, the needles have around point, ball point, or a cutting point. Generally, round points and ball points are used for woven and knit fabrics because they can penetrate the fabric by spreading the fibers or deflecting the yarns without damaging them, while needles with cutting points are used mainly for leather.

The different points of a needle are as follows.

Sharp needle

It is pointed and ideal for almost all woven fabrics.

Ball point needle

It has a slightly rounded tip, which is recommended for all knit and elastic fabrics.

Wedge point needle

A specially designed needle with a wedge like, triangular point, which enables it to make large, clean holes through thick material like leather, vinyl or suede (pronounced as swayed). They are ideal for shoe repair, belts and other leather garments and accessories.

Sewing machine needles can affect the output of a sewing machine. When an inappropriate needle or bent needle is used, it can cause skipped stitches, poor stitch formation, and even damage to the machine.

Selection of needle, thread and stitch for various fabrics

There is no rigid rule for the selection of needle and thread but it should be chosen mainly as per the type of fabric. The recommended needle and thread selection is given in the table below.

Table3.1: Recommended needle and sewing thread selection

S.No.	Type of Fabric	Type of Thread	Needle Number	Number of Stitches per inch*
1	Light weight: lawn,voile, chiffon, organza, fine lace	Mercerized cotton, silk, nylon, extra Fine (any fiber), size: 60–100	9 or 11	10 – 15
2	Medium weight: crêpe, velvet, gingham, stretch fabric, terry, brocade, linen, corduroy, some types of denim	Polyester, cotton-wrapped polyester, mercerized cotton, size: 50–60	11 or 14	10 – 12
3	Heavy: wide rib or duroy, terry cloth	Polyester, cotton-wrapped polyester, Heavy duty (any fiber) size: 30-40	16 or 18	8 – 12
4	Very heavy: canvas, Up holster fabric	Polyester, cotton-wrapped polyester, Heavy duty (any fiber) size: 20	16 or 18	8 – 12

Sewing thread



Fig.3.30: Sewing thread

Wide varieties of sewing thread are available in the market (Fig. 3.30). It is very important to select the correct sewing thread for the fabric. They should share the same characteristic as they will be laundered, ironed in the garment and thus, will stretch and shrink together. A long staple thread is smoother and creates less lint in the sewing machine. Made of short staples, the thread is uneven in texture and the result is less than perfect stitching.

A strong thread is good for construction, especially on fabrics of natural fibre. Mercerised cotton has been treated to be smoother and straighter with less fuzz than other cotton threads. Polyester thread has a high sheen and is abrasion-resistant. Silk thread is strong and lustrous.

This thread is used for construction and stitched details such as button holes and top stitching. Always select a thread according to the type of fabric being used. Use synthetic threads with man-made fibres and mercerised cotton or silk thread with cotton or linen. Woollen fabrics should be sewn with silk or synthetic threads as they have stretching capacity with the fabric. Select a thread which is one shade darker than your fabric because when worked on a garment, a thread appears lighter. The higher the number on the label of a thread, the finer it is. When stitched, the thread should be well set into the fabric to give a firm long-lasting seam. If the thread is too heavy for the fabric, it will remain on the surface and tear out quickly, reducing the durability of your garment.

Thimble

It is used to protect the fingers or thumb in the process of hand sewing. A thimble helps push the needle to the fabric painlessly, without harming the finger. Metal, rubber and plastic thimbles are available in the market. Always use a thimble while hand sewing. Thimbles can be worn in any of the fingers or the thumb of the hand. Mostly, it is worn in the index or middle finger which holds the needle. It must be comfortable and should be light in weight (Fig.3.31).

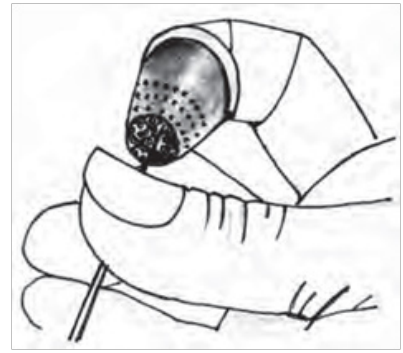


Fig.3.31: Thimble

Stiletto

It is a sharp pointed tool used for punching holes in a fabric/material (Fig.3.32). It is used for forming eyelets in belts, and for making intricate holes in garments.



Fig. 3.32: Stiletto

Bodkin

It is a flat needle with a blunt end and a large eye for threading elastic and tape through a loop or hem (Fig.3.33).



Fig. 3.33: Bodkin

Practical Exercises

Activity 1

Visit a sewing machine shop/boutique/workshop/garment manufacturing unit and make a report on the different type of needles and threads used for different type of fabrics.

Requirements

1. Notebook
 2. Pen
 3. Camera (if available, or mobile phones with camera)
 4. Vehicle (bus) for field visit
1. Visit the local sewing machinery shops/boutiques/workshops/garment manufacturing units with your teacher to study and observe the different type of needles and threads used for different fabrics.
 2. Write down the different type of needles and threads used in shops/boutiques/workshops/garment manufacturing units.
 3. Prepare a report of the study field visit using photos and materials (if any) collected from the site.

Activity 2

Draw the different type of needles and label their different parts in your practical file.

Material Required

1. Practical file
2. Pencil
3. Eraser
4. Sharpener
5. Ruler

Procedure

Draw a hand and sewing machine needle in your practical file with the help of a pencil and ruler. Label its parts.

Check Your Progress

A. Choose the correct answers.

- 1) The hand needles are _____ types.
a) 3 b) 2 c) 1 d) 4
- 2) It is use to protect the fingers _____.
a) Thimble b) Bodkin c) Finger cap d) Stiletto
- 3) It helps the sewing thread to create a loop _____.
a) Short groove b) Long groove c) Groove d) None of the above

B. Match the columns

Tools	Functions
(a)Thimble	1. punching holes in material
(b)Needles	2. threading elastic through loop
(c)Bodkin	3. passing the thread through the fabric
(d)Stiletto	4. safety of the finger

C. One word Question and Answers.

- 1) What is hand needle?
- 2) Write the parts of needle?
- 3) What is thread?

D. Answer the following questions.

1. Write a short note on

- a) Thimble
- b) Bodkin

E. Long Answers.

- 1) Explain sewing machine needle with diagram.
- 2) Difference between hand and sewing machine needle.

Reference link:

- <https://egyankosh.ac.in/bitstream/123456789/100437/1/Unit-15.pdf>
- <https://haberdasherbee.co.uk/blog/choosing-needle-thread/?srsltid=Afm-BOooi77GnRsqbMqBh-sjSgbpm9UogO1IQnpgPe16AMgJmS5pMTJQR>

SESSION 4:

PREPARATION AND OPERATION OF SEWING MACHINE

There are some key steps that need to be kept in mind for the preparation and operation of the sewing machine.

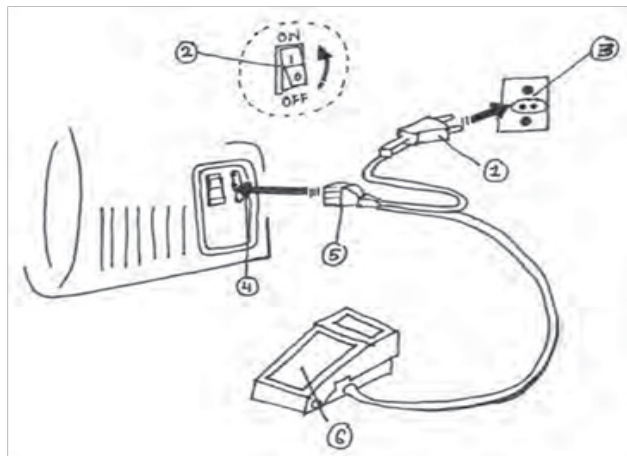
Preparation of a single needle sewing machine

Before starting the operation process in a single needle sewing machine, an Operator should be aware of every aspect relating to the sewing machine. This includes the problems one may be faced with while working too, so that they may be rectified by the Operator or can be reported to one's supervisor.

The steps for preparing a sewing machine for stitching are listed below.

- (a) Connect the machine to the power supply
- (b) Placement of foot control
- (c) Adjust the presser foot
- (d) Wind the bobbin
- (e) Select the correct needle and thread for sewing
- (f) Fix the needle in to needle bar
- (g) Set the bobbin and bobbin case in the machine
- (h) Thread the machine
- (i) Adjust the thread tension
- (j) Adjust the stitch length
- (k) Check the stitch formation
- (l) Check the reverse stitching lever

(a) Connect the machine to the power supply



(1)Power plug (2)Power switch (3)Power socket

(4)Machine socket (5) Foot control plug (6)Foot control

Fig.3.34: Connection of power supply to the sewing machine

Before connecting the power cord, ensure that the voltage and the frequency shown on the sewing machine conform to the electrical power.

1. Connect the plug to connect the foot control.
2. Now, connect the foot control to the machine socket.
3. Connect the power plug to the power socket.
4. Switch on the power and sewing light.(Fig 3.34)

Note: This step is applicable for a motorized sewing machine.

(b) Placement of foot control

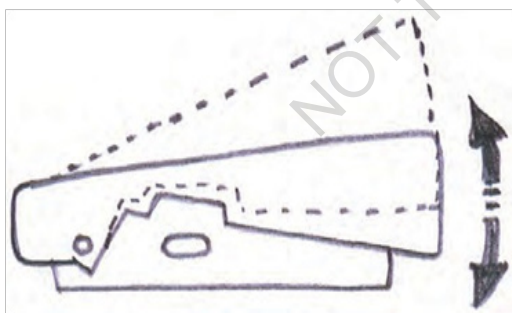


Fig.3.35: Foot control

1. The speed of the sewing machine can be controlled by the foot control. The stronger it is pressed on the control, the faster the machine runs.

2. The foot control should be placed at the correct position for the Operator to operate it comfortably. (Fig 3.35)

Note: This step is applicable for a motorized sewing machine.

(c) Adjust the pressure of the presser foot

It is important for a Sewing Machine Operator to have complete knowledge of the required pressure on the material, and method of adjusting the pressure when needed. The pressure of the presser foot is required to be adjusted as per the thickness or heaviness of the fabric/material to be sewn. Heavy fabrics require more pressure than the light weight fabrics. The pressure should be heavy enough to prevent the fabric from rising with the needle, and to enable the feed to move the fabric along evenly without side creeping.

The pressure of the presser foot can be adjusted by using the thumb screw. To increase the pressure, turn the thumb screw clockwise or downward. To lighten the pressure, turn the thumb screw anticlockwise.

When the pressure is appropriately applied, correct stitches will be formed (Fig.3.36).



Fig.3.36: Correct stitches

(d) Wind the bobbin

A sewing machine has two thread sources for stitching—a top thread and a lower thread stored on a bobbin.

The following steps are to be followed to fill the bobbin.

1. To wind the bobbin with the thread, place the bobbin spool on the bobbin winder fitted on the top.
2. Wrap the thread from the reel placed in the thread spool around the bobbin.
3. Press the treadle/foot control or turn the hand wheel to start winding.
4. The winding in the bobbin should be uniform.
5. Once the bobbin is sufficiently filled with thread, stop winding and remove the bobbin.

(e) Selection of needle and thread for sewing

For the selection of the appropriate needle and thread, kindly refer to session 3 of this Unit.

(f) Fix needle into the needle bar

Sewing machine needles have one side flat, so they can only be placed from one side usually the flat side towards the back.

The following steps should be followed to fix the needle into the needle bar.

1. Pull the needle bar to the highest level to insert the needle (Fig.3.37 Label:1).
2. Loosen the screw or needle clamp to fix the needle (Fig.3.37 Label:2).
3. Keep in mind that there is a groove. Insert the needle (Fig. 3.37 Label: 3) in a straight line in the groove and tighten the needle clamp securely and tightly to fix the needle properly.
4. If you are still having trouble, refer to your machine's manual.

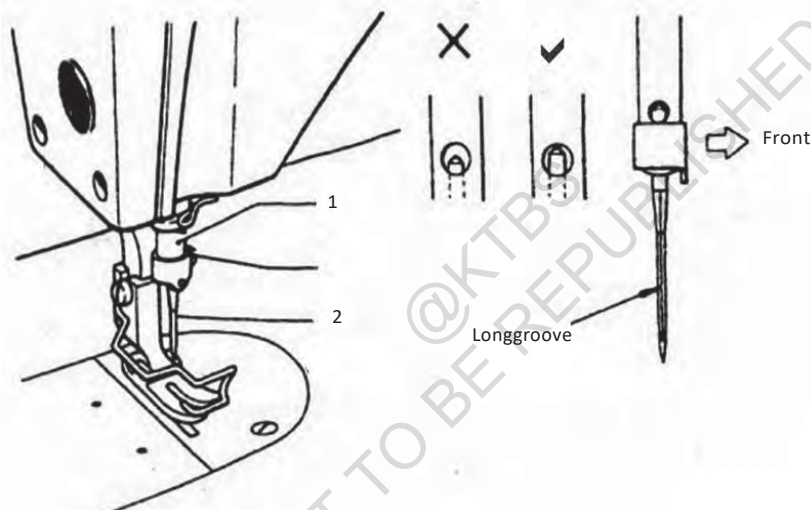


Fig.3.37: Attaching the needle

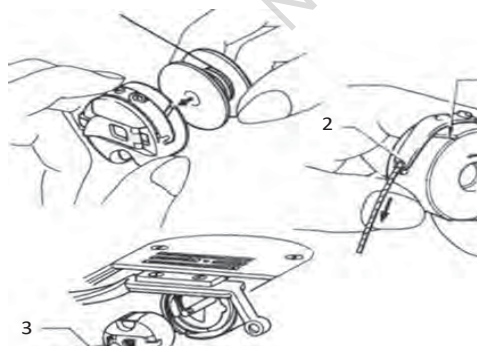


Fig. 3.38: Threading the lower thread

(h) Set the bobbin and bobbin case in the machine

1. Hold the wound bobbin and bobbin case with both hands.
2. Place the bobbin in the bobbin case correctly.
3. Pass the thread through a small notch at the front of the bobbin case and then pull the thread out, as shown Fig. 3.38 Label: 1 and 2.

4. It should be checked that the bobbin should move clock wise when the thread is pulled out.
5. Leave the end of the thread outside the bobbin case. It should be brought up through the hole in the needle plate after the top thread is threaded.
6. Hold the latch of the bobbin case and fix it into the rotary hook (Fig.3.38 Label: 3).

Lock the bobbin case in the machine.

(i) Thread the machine

1. The take-up lever should be raised to keep the needle at its highest point which will help in threading the upper thread.
2. This will make threading easier and it will prevent the thread from coming out while sewing.
3. Take the thread end with the hand and pull it through the thread guide at the top, and then down.
4. Then thread it around the take up lever.
5. Follow the instruction to thread as per the guide lines printed in your machine's manual.
6. Usually, the thread follows this general pattern: left, down, in to a hook, through the needle.

(j) Adjust thread tension

For good quality stitching, a balanced tension or balanced stitches are desirable. When the tension of the upper and lower thread is balanced, the threads interlock in the middle of the fabric to make perfect or balanced stitches. Adjust the tensions only as needed until the stitch is balanced.

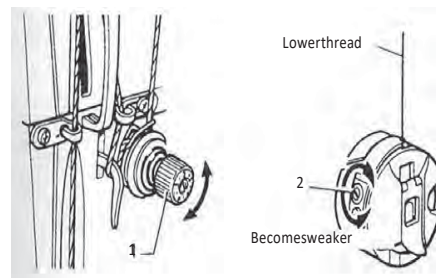


Fig.3.39: Adjusting thread tension

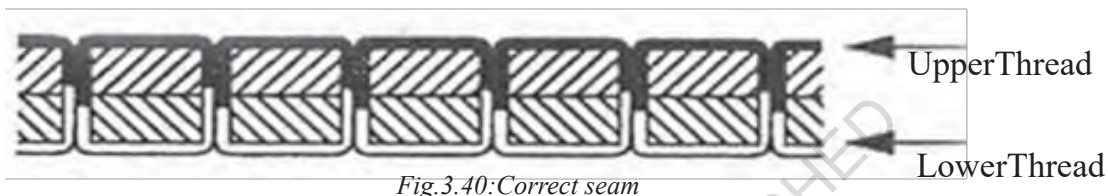
The tension of the stitch is regulated by two controls.

1. Upper thread tension

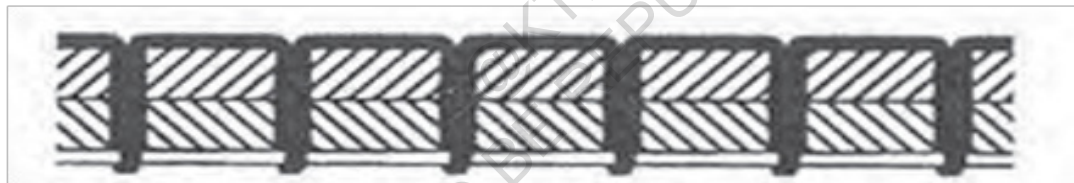
After lowering the presser foot, turn the nut to adjust the upper thread tension. For this, turn the nut to the left to loosen it. Turn it to the right to tighten, as shown Fig. 3.39 Label 1.

2. Lower thread tension

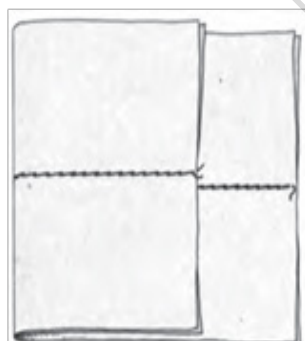
It is adjusted by tightening /loosening the screw of the bobbin case, as shown Fig. 3.40 Label 2. The bobbin Cases crew is very short and will fall out if turned too far. The bobbin case tension screw, which is located on the bobbin case, controls the tightness of the bobbin case spring. These controls increase or decrease the amount of pressure on the threads as they feed through the machine. Appropriate thread tension is needed for perfect stitching. The tension on the needle and the bobbin threads must be heavy enough to pull the threads to the center of the thick ness of the fabric and make a Firm stitch. Correct seam with balanced thread tension is shown in Fig.3.40.



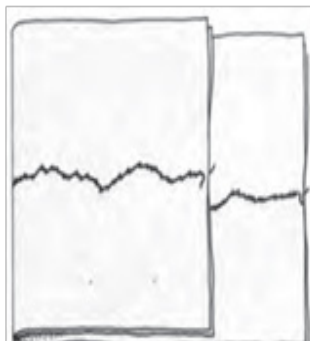
The appearance of seams when the upper tension is too loose is shown in Fig.3.41.



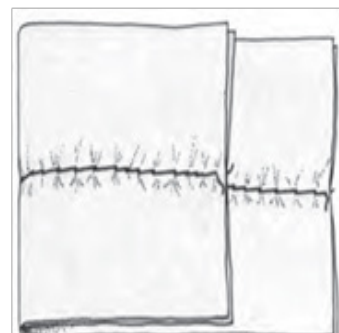
The appearance of seams when the upper thread tension is too tight is shown in Fig.3.41. Seams when the upper tension is too tight.



(a) Correct stitch



(b) Too loose



(c) Too tight

Fig 3.42 (a,b,c)

Tension problems

The structure, texture, thickness, density, and resilience of the fabric, and the size and type of the thread, affect the tension. The tension setting will vary with the material and the thread size and type. Test the tension before you begin stitching or sewing with a different fabric, thread, or machine.

(j) Adjust the stitch length

A stitch length regulator/dialis used to adjust the stitch length and get the desired length. The stitch length regulator/dial controls the distance that the feed dogs move the fabric to the back of the machine to make a single stitch. The bigger number on the stitch length dial produces a long stitch, and the smaller number produces a smaller stitch. To change the stitch length, dial from a larger setting to a smaller setting, it is simpler to turn the dial.

(k) Checking the stitch formation

Before starting sewing on the final material, it is a good practice to check the formation of stitch on a rough fabric. Change the pressure and thread tension as required for correct stitch on the final material.

The method of stitch formation in a sewing machine (Fig.3.43) is as follows.

1. The needle descend (that is, the down ward action of the needle) passes through the fabric.
2. Then it reaches its lowest point and begins to rises lowly.
3. It creates a loop. The shuttle enters the slack-loop, enlarging it and taking with it the under thread, and when the needle reaches back to its highest level, acomplete inter lock stitch is formed.

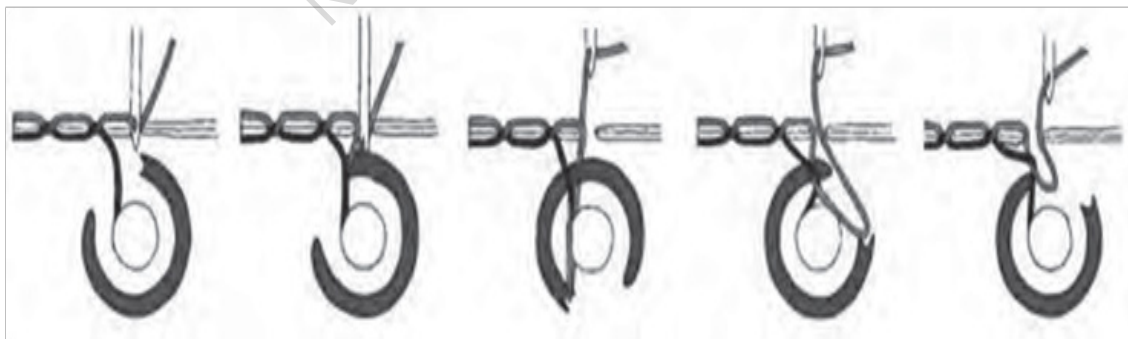


Fig.3.43:Steps of stitch formation

(l) Checking of reverse stitching lever

1. When the reverse stitching lever is pushed, the cloth feed direction for sewing will be reversed.
2. When it is returned to its original position, the feed direction for sewing will change back to normal.

Operating the sewing machine

Single needle sewing machines are mostly used in domestic tailoring and also in industrial or commercial production. They are most commonly used as they serve the purpose of basic seam formation. As the name suggests, the machine uses a single needle to make a single seam line. The stitch is formed by interlocking two threads the upper and the lower bobbin thread.

The following are the steps for operating a single needle sewing machine.

(a) Sew on the fabric

1. Raise the presser foot and then turn the fly wheel so that the take-up lever is at its highest level.
2. Pull the upper and lower threads straight back side under the presser foot to avoid them from knotting at the beginning of the stitching line.
3. Place the fabric to be stitched under the presser foot, allowing the seam allowance to the right side of the needle and the rest of the fabric to the left.
4. Turn the fly wheel until the needle point enters the fabric at the exact beginning point.
5. Lower the presser foot and then start the machine slowly, simultaneously guiding the fabric gently with the hand.
6. To check stitch length and proper tension, first stitch on a scrap, that is rough cloth. Finalize it and then stitch on the final material.
7. Gradually, increase the speed of the sewing machine for stitching.
8. The fabric will move forward and the stitch will be formed continuously.
9. Before the end of the stitching line, stitch slowly with the right hand on the flywheel and left hand on the fabric that is being worked on (while using hand machine). Stop the machine in time to not sew beyond the fabric.

-
-
10. Take up the presser foot, then pull the material straight back with threads under the presserfoot to avoid bending of the needle.
 11. Cut the threads using the thread cutter or scissors.

Precaution

1. Do not pull the material/fabric for ward or back ward, but hold the two layers slightly tight and firm at the back and front of the presser foot.
2. Keep the take-up lever at its highest point to avoid unthreading the needle when beginning to stitch again.
3. Leave about two to four inches of thread, extending from the machine to prevent unthreading.

(b) Fastening the thread ends

It is essential to fasten the threads at the ends of the stitching lines which are not to be crossed later (for example, points of darts).

This can be done in three ways.

Reverse stitching

Stitch till the termination point with the needle in the fabric. Now carry out reverse stitching, and then cut the threads.

Pivoting

Stitch till the termination point with the needle in the fabric, lift the presser foot and stitch back a small distance along the seam. Cut the threads.

Tying

After you have reached the end of the stitching line, pull the fabric back and cut the threads, leaving a length of about two to four inches extending from the fabric. Pick the last stitch with a pin or needle point so that both the thread ends come to the wrong side of the fabric, and then tie a double knot.

Practical Exercises

Activity 1

Practice the following on a sewing machine in the practical lab.

1. Connecting the machine to the power supply
2. Understanding the placement of foot control
3. Adjusting the presser foot
4. Winding the bobbin
5. Selecting the appropriate needle and thread for sewing
6. Fixing the needle into the needlebar
7. Setting the bobbin and bobbin case in the sewing machine
8. Threading the machine
9. Adjusting the thread tension
10. Adjusting the stitch length
11. Checking the stitch formation
12. Checking the reverse stitching lever

Material Required

1. Single needle lock stitch machine (manual operated or motorized)
2. Power socket and outlet
3. Sewing machine needle
4. Screw driver
5. Thread
6. Bobbin and bobbin case
7. Fabric scraps

Procedure

Follow the instructions given in this session.

Activity 2

Practice operating the sewing machine in the practical a band prepare a sample of the different stitch formations.

Material Required

1. Single needle lock stitch machine (manually operated or motorized)
2. Power socket and outlet
3. Sewing machine needle
4. Thread
5. Bobbin and bobbin case
6. Fabric scraps (10"X10") 4 samples
7. Practical file
8. Scissor
9. Adhesive/glue

Procedure

1. Prepare the sewing machine as per instructions given in this session for stitch.
2. Prepare the samples of correct stitch, or a stitch when the upper tension is too tight and too loose.
3. Finish the prepared samples.
4. Attach samples in your practical file.

Check Your Progress

A. Fill in the blanks

1. Speed of sewing machine can be controlled by the _____.
2. Check that the bobbin turns _____ when the thread is pulled.
3. When the reverse stitching lever is pushed, the cloth feed direction for sewing will be _____.

B. Answer the following questions

1. Write steps of threading the sewing machine.
2. Write short notes on:

-
- (a) The steps for operating the sewing machine
 - (b) Placement of foot control
 - (c) Adjusting the stitch length
3. Write about adjusting the pressure of the presser foot.

C. Long answer

1. Explain the thread tension as per the stitch formation with a diagram.
2. Explain the winding of bobbin and its setting in the machine
3. Describe the operating procedure of a sewing machine and the precautions while sewing.

Reference link

- <https://ncert.nic.in/vocational/pdf/ivsm101.pdf>
- <https://www.scribd.com/document/699405730/Y1-Module-1-Setting-and-Operating-Sewing-Machines>

UNIT - 4 Part A: Seams and Seam Finishes

Session	Topic	Session	Outcomes
Part-A	Seams and Seam Finishes		
1		Different Type of Seams	At the end of the lesson, the students will be able to: ► Identify what are the basic different types of seams. ► Differentiate between construction and decorative stitches. ► Follow step by step the basic sewing techniques. ► Describe the Basic Techniques in Sewing
2		Seam Finishes	At the end of the lesson, the students will be able to: ► Identify what are the basic different types of seams. ► Understand the significance of finishes. ► Follow step by step the basic edge finishes sewing techniques. ► Describe the Basic Edge finishes Techniques in Sewing.
Part-B	Care and Maintenance of Sewing Machine and Hazards		
1		Cleaning, oiling and Handling of Sewing Machine	At the end of the lesson, the students will be able to: ► How to cleaning and oiling sewing machine. ► Care and Maintenance of sewing machine. ► Handling of material tools and equipment. ► Cleaning, oiling and handling of single needle sewing machine

2		Sewing Defects and its Solutions	At the end of the lesson, the students will be able to: ▶ Identify common sewing machine defects and there solutions. ▶ Explain the causes of these problems. ▶ How to come machine defects possible causes and their corrective actions
3		Hazards and safty Measures in Sewing Industry	At the end of the lesson, the students will be able to: ▶ Explain the differences of risk & Hazards in sewing industry. ▶ Differentiate the risk and hazard ▶ Student will be to identify hazards.

SESSION 1:

DIFFERENT TYPE OF SEAMS



Seams refer to the stitching line where two pieces of fabric are stitched together. It is the basic building unit of any garment or stitched article. It is an application of a series of stitches or stitch types to one or several thickness of material. Seams mainly construct the structure of the garment or stitched article. It is also used for decorative purpose. Decorative seams are mainly used for decorative purposes while functional seams are used mainly for the purpose of construction. An example of decorative seams is a tucked seam, and example of functional seam is flat seam, French seam etc.

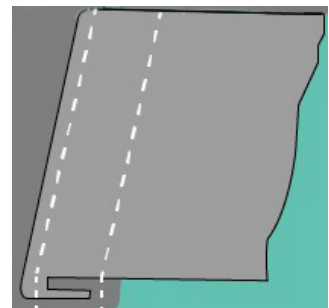
Good appearance in a seam normally means smooth fabric joins with no missed or uneven stitches and no damage to the material being sewn. Alternatively, it means regular gathering to form a style feature or a varying but controlled amount of ease to ensure a good fit of the garment to the body, with the wide variety of fiber types and fabric construction available. Seams should be as strong as the fabric.

Following are the points to be considered while making seams.

Seams are commonly machine stitched but one can hand stitch a seam using back stitch. Before making a seam, ensure that the needle and thread used are appropriate for the fabric weight and texture. Because the seams of a garment must with stand wear and tear, the beginning and the end of the line of stitching should be secured with a few back stitches. To prevent fraying, enough quantity of fabric should always be left between the line of stitching and the fabric edge. There are different type of seams, and the type of fabric and garment should determine the one you select. Some commonly used seams are given below.

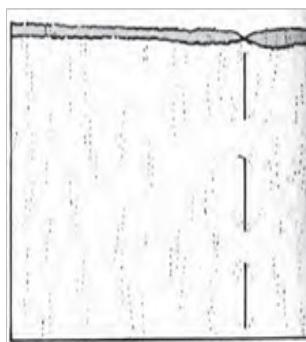
Flat seam

It is the basic seam (functional seam), joining the edges of two pieces of fabric. This seam is used on medium weight fabrics where there is no special strain on the seam. Mostly, plain straight stitch is used to stitch the seam. Flat seam can be used on most of the garments and the seam edges should always be finished as appropriate for the type of fabric. (Fig 4.1)

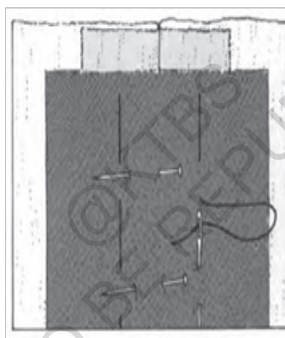


Channel seam

This is a decorative seam mostly used in trousers, pockets of jeans, jackets, etc. It has a strip of fabric behind it which is visible through the seam fold. It can be made of contrasting fabric, if desired. With the right sides of the fabric together, pin and tack along the seamline. Press the seam open and cut an underlay of the same or contrasting fabric 1 inch wider than the two seam edges. With the wrong side of the work facing you, center the right side of the underlay on the seam and pin in the position. Pin and then stitch an equal distance, each side from the seam depression. Remove the pins and tacking, then press as stitched.



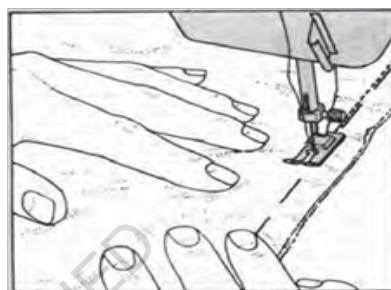
(a) Tacked fabric together



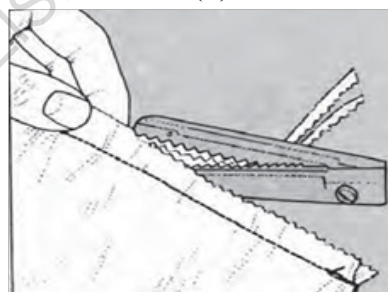
(b) Underlay pinned to seam



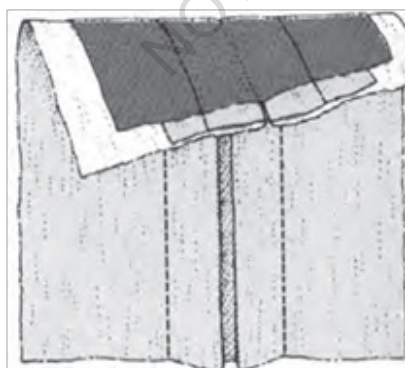
(a)



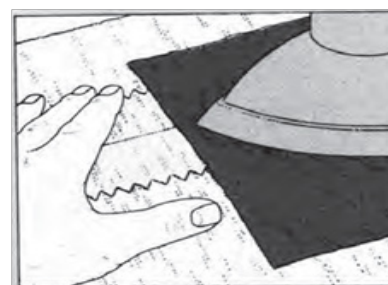
(b)



(c)



(c) Completed seam



(d)

Fig.4.2 (a,b,c) Channel seam

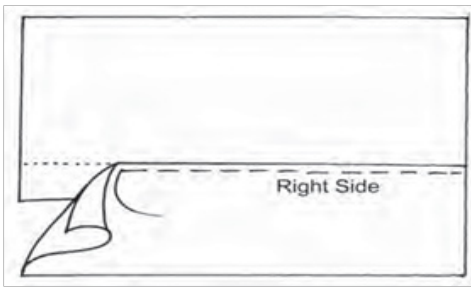
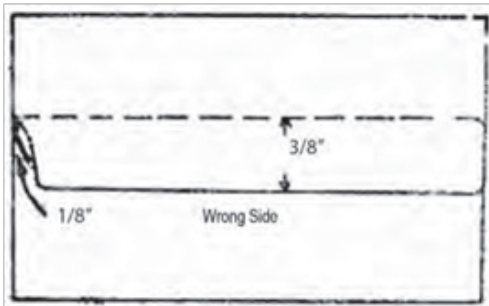
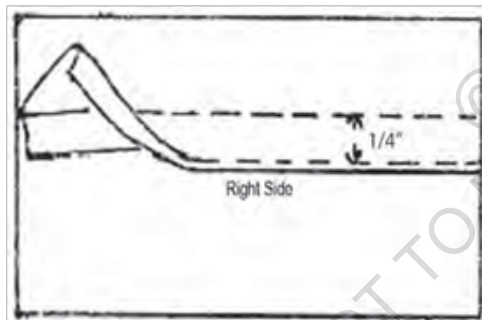


Fig.4.3: Lapped seam

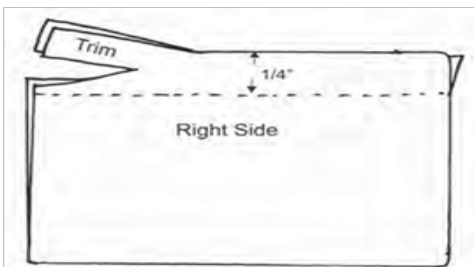


(a)



(b)

Fig.4.4(a,b) Flat felled seam



(a)

Lapped seam

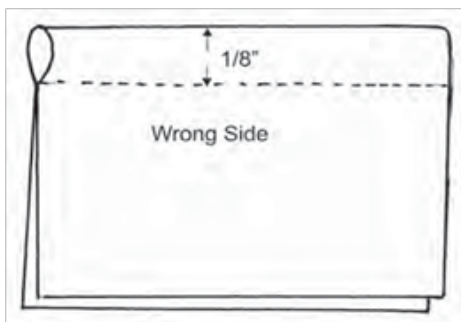
This seam is used for joining sections of interfacing to avoid bulking that is a mass of fabric getting thick. Lap one edge of the fabric over the other with the seam lines directly over each other. Tack and then stitch along the seam line with a wide zigzag stitch or a straight stitch. Trim the seam edges (Fig.4.3).

Flat felled seam

This is a flat, durable and strong seam used mainly on men's sports shirts, work clothes, children's clothes and pyjamas. It is time consuming and difficult to make on curved edges and on bulky fabrics. Place the fabric pieces to be joined at the wrong side facing, and then stitch on the seam line. Press both seam allowances together in the same direction and trim the under seam allowance to $\frac{1}{8}$ inch and the upper one to $\frac{3}{8}$ inch (Fig. 4.4 a). Turn under the raw edge of the wide seam allowance so as to make a smooth fold of $\frac{1}{4}$ inch wide. Stitch close to the fold edge on the right side of the garment. The right side of the seam shows two rows of stitching and wrong side shows only one row of stitching (Fig.4.4b).

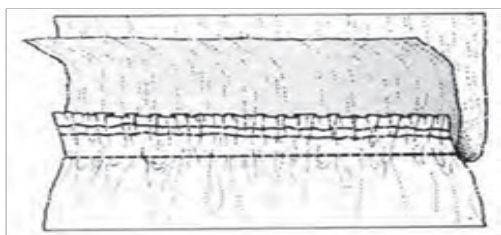
French seam

It is an arrow seam generally used for fine fabrics or for those fabrics which fray easily. It is a seam with in a seam. When finished, it should be about $\frac{1}{4}$ inch or less in width. To make the French seam,

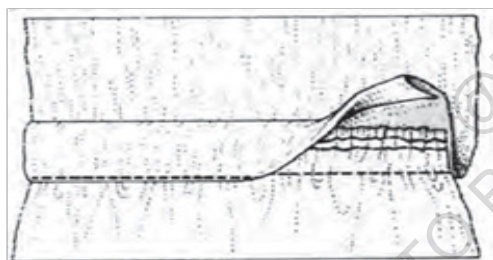


(b)

Fig.4.5(a,b) French seam



(a)



(b)

Fig. 4.6 (a, b) Mantua maker's seam

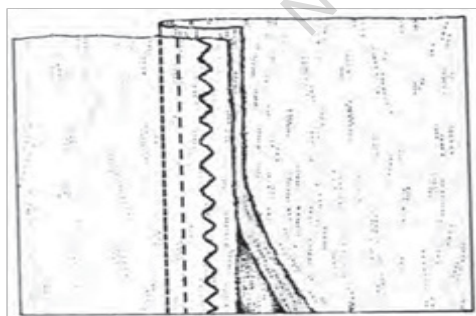


Fig.4.7: Double stitch seam

place the wrong sides of the fabric together. (Fig.4.5a). Pin and tack in position close to the seam line. Stitch $\frac{1}{4}$ inch to the right of the seam line to the end of the seam. Press as stitched. Pressing can be done using hands to form a crease or using a heat pressing iron. Then trim the seam allowance to $\frac{1}{8}$ inch. Press the seam open. Then turn the right sides of the fabric together. Fold on the stitch line and press. Tack in position. Stitch along the seamline and press as stitched (Fig.4.6b).

Mantua maker's seam

It is used to attach a frill to a straight piece of fabric. With the right sides of the fabric together, tack along the seam line and stitch. Trim the frill seam allowance to $\frac{1}{4}$ inch. Double fold the other seam allowance over the raw edged own to the seamline. Stitch very close to the seam line then remove tacking and press the seam up wards, keeping away from the frill. (Fig.4.6a,b)

Double stitch seam

It is used mainly for sheer fabrics. To make this seam, take the right sides of the fabric together, tack and stitch along the seam line and press as stitched. Make another line of stitching in the seam allowance $\frac{1}{4}$ inch from the first line, using a fine multi stitch zigzag or straight stitch. Then trim the raw edge using a scissors or a pinkings heart to prevent the fabric from fraying. (Fig.4.7)



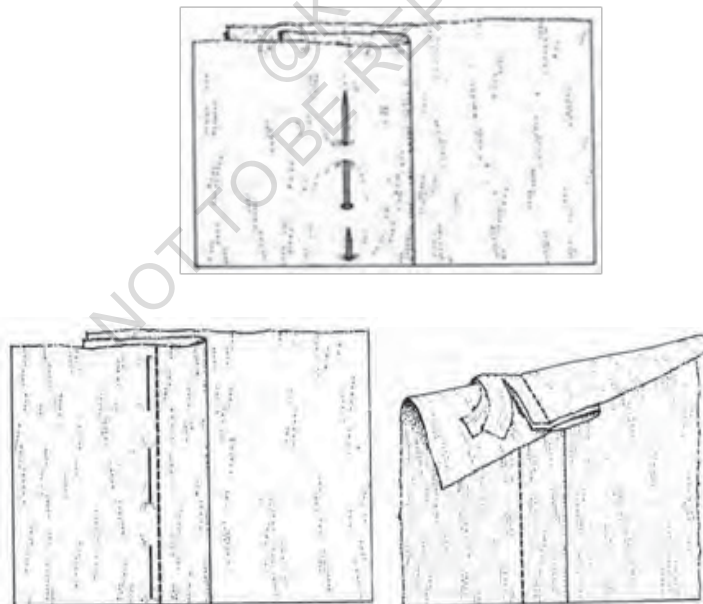
Fig.4.8:Lingerie seam

Lingerie seam

It is used mainly for making very fine seams. It is so named because of its use in lingerie. To make the seam, take the right sides of the fabric facing; pin, tack and then stitch along the seam line. Then press as stitched. Finish the seam edges with pinking scissors and press both seam allowances to one side. Stitch seamedges on the right side with small stitches of zigzag. (Fig.4.8)

Tucked seam

It is a decorative seam and generally used as a design feature on a garment. If a tucked seam is used on a fabric which frays easily, the seam edges should be finished by over sewing. To make a tucked seam, take the right side of the fabric facing you, turn under the seam allowance on one piece of fabric, and then pin in to place. (Fig.4.9 a,b,c)



c) Fig 4.9(a,b,c) Tucked seam

Practical Exercises

Activity 1

To identify the various seams used on a pair of denim jeans, pillow covers, shirt, skirt, frock, bloomer and blouse.

Material Required

1. A pair of denim jeans
2. Pillow covers
3. Shirt
4. Skirt
5. Frock
6. Bloomer
7. Blouse
8. Pen
9. Pencil
10. A3-sized chart sheet
11. Eraser

Procedure

1. Place each of the above items in front of you.
2. Begin by observing and identifying these as an used in each of these. Make a note of your observations.
3. Now take an A3-sized chart sheet and draw out a table.
4. While preparing the chart, remember refer to the notes you made earlier.
5. List the names of the items you observed such as frock, shirt, blouse, etc., on the left side. Now write your observations on the kind of seams used in each of these on the right side of the table.

Activity 2

Prepare samples of different seams as given in this session.

Material Required

1. Cotton fabric to prepare samples (12"x12")
2. Needle, thread and scissors
3. Pen
4. Eraser
5. Pencil
6. Practical file
7. Adhesive/glue
8. Markers/coloured pens
9. Sewing machine
10. Bobbin/bobbin case

Procedure

1. Prepare samples of different seams.
2. Finish the edges of the samples.
3. Attach them in the practical file and write where they are used.
4. Label them.

Check your Progress

A. Choose the correct answers

1. Channel seam is a seam.
 - (a) decorative
 - (b) functional
 - (c) Both (a) and (b)
 - (d) None of the above
2. Seam is used for joining section or parts of interfacing to avoid bulk.
 - (a) Welt

-
- (b) Lapped
 - (c) Channel
 - (d) French

3. Tucked seam is a seam.

- (a) functional
- (b) decorative
- (c) Both (a) and (b)
- (d) None of the above

B. Fill in the blanks

1. Is a seam with in a seam.
2. _____ seam is used to attach a frill to a straight piece of fabric.
3. _____ is decorative seam and generally used as a design feature on a garment.

C. One word Question and Answers

1. Write short notes on the following.
 - (a) Double stitch seam
 - (b) Lapped seam
 - (c) Lingerie seam

D. LongAnswer

1. Describe the various types of seams in detail along with a diagram.

Reference link

- https://www.brainkart.com/article/Seam-Finishes-and-Types-of-Seam-Finishing_35626/
- <http://yesterdaysthimble.com/tutorials/seam-finishing/>

SESSION 2: SEAM FINISHES

Edge finishes are made to prevent fraying of the edges of the fabric or garment and thus, make the fabric edge more durable and attractive. They also provide a neat appearance to the inner side of the garment. Although edge finishes are not essential for completion of the garment, it can add durability to a garment's life. There are various types of edge finishes. They may be carried out by hand stitches or by sewing machine. Some of the common edge finishes are described in this session.

Different type of edge finishes

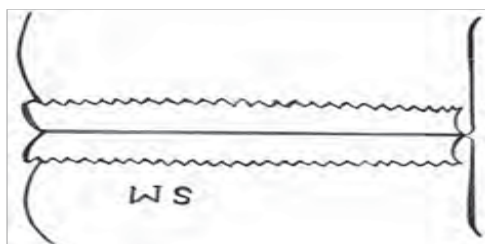


Fig.4.10: Pinked finish

Pinked finish

This is a quick method of finishing done with pinking shears (a kind of fabric cutting scissors). After stitching, trim the edges, preferably at a distance of $\frac{1}{8}$ inch by using pinking scissors (also called pinking shears). This technique is not used on fabrics that ravel badly (Fig.4.10).

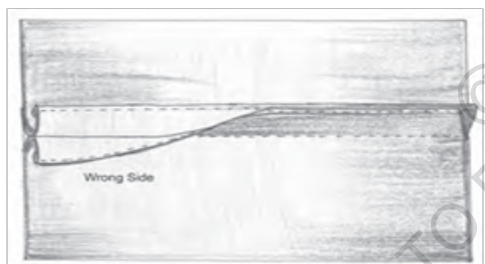


Fig.4.11: Edge stitched finish

Edge stitched finish

This is a neat finish for light to medium-weight, non-bulky fabrics. In this finish, the seam is stitched and pressed open. Then turn under $\frac{1}{4}$ inch on each seam edge. Stitch close to the fold without catching the garment (Fig.4.11). This is a bulky type of finish and is not suitable for deeply curved seams. This finish is mostly used on unlined coats and jackets where the seam allowance is wide.

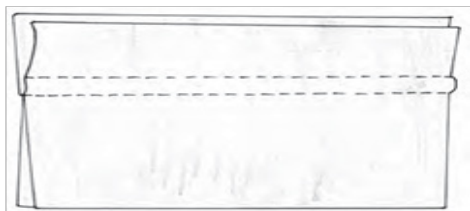


Fig.4.12: Double stitch finish

Double stitch finish

After making a plain seam, to carry out double stitch finish work, an extra line of stitching is made about $\frac{1}{4}$ inch from the raw edge of the fabric or garment (Fig. 4.12). This is done for a plain unfinished seam or pinked seam. It is not suitable for bulky fabrics. This type of finish is commonly used on sheer fabrics.

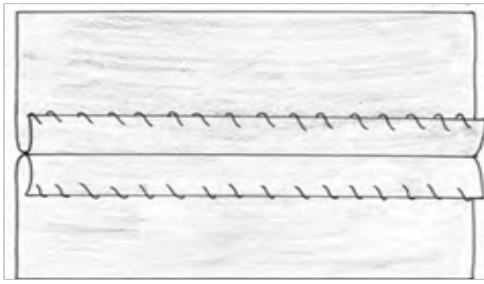


Fig.4.13:Double stitch finish

Herring bone finish

This finish neatens the raw edges of heavy material like flannel, brocade, tweed, etc. It also holds down the turning, making the seam flat, avoiding the bulkiness. After pressing the seam open, herring bone stitches are worked on the two raw edges (Fig.4.13).

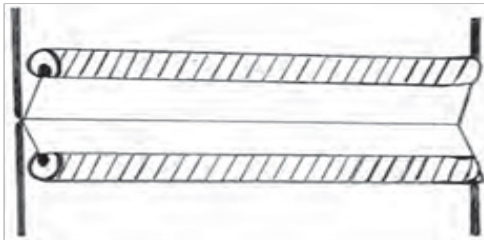


Fig.4.14:Bound seam edge Finish

Bound seam edge finish

In this method, the seam is pressed open and a separate piece of binding (a double folded bias strip) is attached to both the seam edges (Fig. 4.14) and tacked. It is often used on light weight fabrics like silk, chiffon, etc.

Practical Exercises

Activity 1

Draw pictures of various types of edge finishes and prepare a scrap book.

Material Required

1. Pen
2. Pencil
3. Sharpener
4. Eraser
5. Scrapbook
6. Ruler
7. Markers/coloured pens

Procedure

1. Draw edge finishes on the scrap book and write where they are used.
2. Label them.

Activity 2

Prepare samples of edge finishes as given in this session.

Material Required

1. Cotton fabric to prepare samples (12"X12")
2. Needle and thread
3. A3-sized chart sheet
4. Adhesive/glue
5. Pen
6. Pencil
7. Eraser
8. Markers
9. Coloured pens
10. Pinking scissors
11. Sewing machine
12. Bobbin/bobbin case

Procedure

1. Prepare samples of edge finishes.
2. Paste them on a chart sheet.
3. Label them.
4. Place the chart in the classroom or practical lab.

Check your Progress

A. Choose the correct answers

1. Seam edge is trimmed with pinking shears and gives a zig zag appearance.
 - a. Pinked finish
 - b. Herring bone
 - c. Double-stitch finish
 - d. None of the above

-
-
- 2 In a separate piece of binding is attached to both seam edges.
 - a. pinked edge
 - b. bound seam edge finish
 - c. herring bone finish
 - d. double stitch
 - 3 Finish is suitable for heavy fabrics.
 - a. Pinked edge
 - b. Edge stitch
 - c. Herring bone
 - d. None of the above

B. Fill in the blanks

1. _____ Finish is commonly used on sheer fabrics.
2. Edge finishes are made to prevent _____ of the raw edges of the fabric/garment.
3. _____ is a neat finish for light and medium-weight, non- bulky fabrics.

C. One word questions and answers

1. Write short notes on the following
 - i. Bound seam edge finish
 - ii. Herring bone finish
 - iii. Pinked seam
 - iv. Edge stitch finish
2. Explain the double stitch finish.

D. Long answer

- a. Describe various types of edge finishes and their use in detail along with diagrams.

Reference link

- <http://yesterdaysthimble.com/tutorials/seam-finishing/>

UNIT -4 Part B: Care and Maintenance of Sewing Machine and Hazards

Session	Topic	Session	Outcomes
Part-B	Care and Maintenance of Sewing Machine and Hazards		
1		Cleaning, oiling and Handling of Sewing Machine	At the end of the lesson, the students will be able to: ▶ How to cleaning and oiling sewing machine. ▶ Care and Maintenance of sewing machine. ▶ Handling of material tools and equipment. ▶ Cleaning, oiling and handling of single needle sewing machine
2		Sewing Defects and its Solutions	At the end of the lesson, the students will be able to: ▶ Identify common sewing machine defects and there solutions. ▶ Identify various types of defects. ▶ Explain the causes of these problems. ▶ Describe the procedure to follow in case the needle breaks.
2		Hazards and safety Measures in Sewing Industry	At the end of the lesson, the students will be able to: ▶ Explain the differences of risk & Hazards in sewing industry ▶ Differentiate the risk and hazard ▶ Student will be to identify hazards. ▶ Identify Hazards and Risk. ▶ Five basic work place hazards

UNIT -4

Part B: Care and Maintenance of Sewing Machine and Hazards

INTRODUCTION

The care and maintenance of a sewing machine helps to improve its working. This consists mainly of cleaning, oiling, and right handling, which contributes to good output, quality production and safety of the workers. Care and maintenance is also necessary in order to operate the machine smoothly and for its long term use. It is very important to identify the sewing defects such as upper thread break, bobbin (lower) thread break, bunching of threads, skipped stitches, irregular stitches and stitches that are not formed properly, etc., for proper working of sewing machine and good quality production. This Unit discusses the cause and different defects and the corrective action to be taken.

SESSION 1: CLEANING, OILING AND HANDLING OF SEWING MACHINE

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

Cleaning of sewing machine

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

Material required for cleaning

1. Flat paint brush ($\frac{1}{2}$ " to $\frac{3}{4}$ " wide)

-
2. Cleaning solvent or fluid
 3. Soft disposable cloth
 4. Screw driver
 5. Sewing machine manual
 6. Small handy vacuum cleaner

All dust and dirt can be removed by wiping the part out carefully with the cloth, but if the machine is clogged, a more careful cleaning is necessary. Common tools like a small dry brush or old tooth brush or compressed air and a soft cloth are used to remove dust and lint. (Fig.4.1.5a,b)

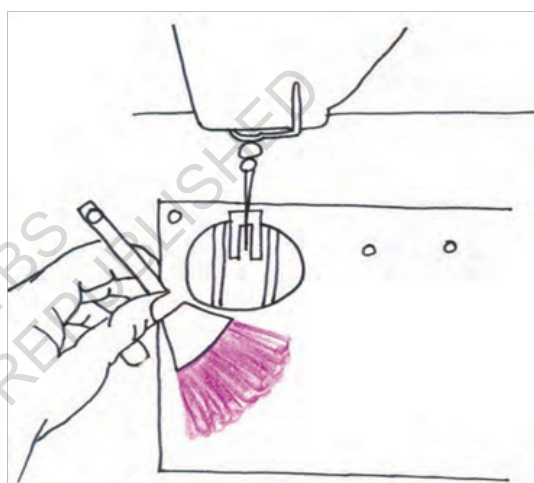
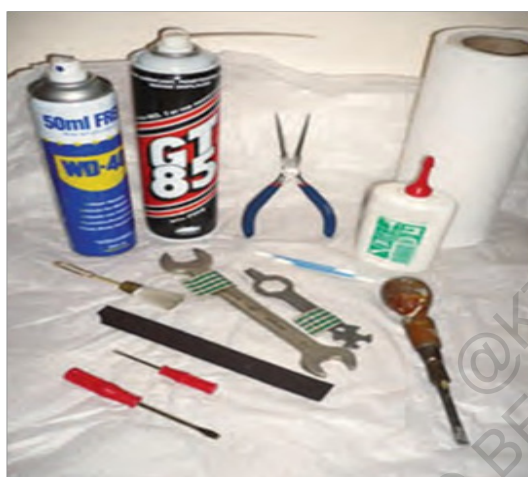


Fig.4.15 (a,b) Tools for cleaning sewing machines

Points to be considered while cleaning

1. Before cleaning any machine, turn it off.
2. Open the slide plate and remove the bobbin case. Then remove the throat plate. Whenever it is required, remove the face plate from the left end of the head.
3. Any lint, dust, or loose threads in the area around the feed dog and rotary hook, shuttle may be brushed or blown away. Do not use anything hard, such as a screw driver or scissors points, to remove the lint. Instead, carefully use a pointed instrument like a needle or pointed tweezers/plucker to pick out bits of thread and lint that cannot be brushed out.

-
4. Turn the hand wheel manually to expose any are as that might have been hidden initially. Brush again.
 5. Carefully tilt the machine head back until the head rests on the post on the back of the table.
 6. Brush out any lint, dust, or threads from the lower part of the machine.
 7. Use a soft, thin and clean cloth to remove any lint on the machine parts.
 8. Un screw all plates and screws and the bobbin case.
 9. Check the needle to be sure it is clean and the eye is not clogged.
 10. Replace the needle, if necessary.
 11. Wipe away any excess oil or dust on the head, machine bed, motor, table, and stand.
 12. If there is lint between the tension discs and in the thread guides, use thread to floss the tension discs and remove any lint.
 13. If you have oiled the machine, sew on few scrap store move any excess oil.
 14. Wash hands after cleaning and oiling the machine.
 15. After completing the work, put a piece of fabric under the foot, lower the presser foot, cover the machine, and pick up any trash.
 16. Sometimes loose threads wind around the pivots of the treadle and make the sewing machine hard to run. Thread bits must be removed which are caught in the wheel along with all lint and dust sticking to the treadle parts.
 17. Use a cloth or small brush to clean near the needle and feed dog.
 18. If the machine starts to run hard, it is an indication that dirt or lint is jammed inside a bearing. In that case, remove the bobbin case to remove all lint and stray threads. Continuously run the machine and flush it with the cleaning fluid until the dirt and gummed oil are washed from the bearing.
 19. Remove bobbin and bobbin case, and clean small thread particles from there.
 20. Clean the hand wheel, washer, and the shaft. Lubricate the shaft with two drops of sewing machine oil and place a small amount of grease on all gears. reassemble the hand wheel and clutch.
 21. After properly cleaning these areas, reassemble all the parts of the sewing machine and run it. If reassembled correctly, it should run smoothly.
-

Oiling the sewing machine

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

Material required

1. Sewing machine manual
2. Sewing machine oil
3. Soft disposable cloth

Points to remember while oiling the sewing machine

1. Before oiling, ensure that the sewing machine is turned off.
2. Oil the machine using the directions given in the machine manual. Inspect the condition of all visible parts of the machine every time you oil it.
3. If a manual is not available, oil the machine as per the directions of the teacher / instructor as per the required frequency.
4. Locate oil holes of the sewing machine. They are mostly identified by arrows, or red or yellow paint. Put one to two drops of oil into each hole. Too much oil will clog the machine. Turn the hand wheel manually so that the oil will work its way between the parts.
5. Wipe off all dust and excess oil from the machine or table; cleanup any spilled oil immediately.
6. Sew on a few fabric scrap store move any excess oil.
7. Wash hands after oiling the machine.
8. Excess oil is a major problem that can spoil and damage the fabric. Check the machine instruction booklet/manual to determine the types of oil lubricant to use and where to use them. Do not oil the tension discs, the hand wheel release or the belts and rubber rings in any machine. Run the machine so the oil would be distributed into all the bearings. Use oil freely because all oil has been removed in the cleaning process. For later oiling, one drop of oil one achbearing and in each oil hole is enough. After oiling the sewing machine, wipe away the excess oil and reassemble the machine. The oil used should be

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

Care and maintenance of sewing machine

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

Safe handling procedure of sewing machine

The safe handling procedure of the sewing machine involves:

1. Setting up of the sewing machine
2. Adopting safety measures before starting sewing
3. Adopting safety measures during sewing

Setting up of sewing machine

- (i) Position the machine on a hard flat surface.
- (ii) Select and install the needle securely into the needle bar.
- (iii) Select the suitable thread according to the type of fabric to be used.
- (iv) Wind the thread into the bobbin.
- (v) Following the thread guide, thread the machine from the spool pin to the needle.
- (vi) Set the machine of required stitch length.
- (vii) Balance the thread tension on the sewing machine (adjust the upper tension in relation to the lower tension).

Adopting safety measures during sewing

- (i) Practice on a scrap material to check against oil stains, etc.
- (ii) Notice the way the sewing machine sounds. If the sewing machine makes some abnormal sounds or seems louder than usual, get it checked by a technical expert.
- (iii) Sew at a slow, steady pace and use a needle guard to protect the fingers.

Practical Exercises

Activity1

Practice the cleaning of sewing machine and its different parts.

Material Required for Cleaning

1. Flat paint brush ($\frac{1}{2}$ " to $\frac{3}{4}$ " wide)
2. Cleaning solvent or fluid
3. Soft disposable cloth
4. Screw driver
5. Sewing machine manual
6. Small handy vacuum cleaner

Procedure

1. Visit the practical/sewing lab with your teacher.

Activity 2

Practice the steps involved in the oiling of sewing machine.

Material Required

1. Sewing machine
2. Lubricating oil
3. Cleaning cloth
4. Rough fabric

Procedure

1. Visit the practical/sewing lab with your teacher.
2. Place news papers below the sewing machine so that the floor should not be dirty and the newspapers can be thrown away after oiling.
3. Oil all the parts of machine using machine oil.
4. After oiling the machine, clean the extra oil on the machine.
5. Check stitching on a rough fabric so that the machine is checked for smooth running.

Check Your Progress

A. Match the columns

Sewing Tools	Uses
(a) Pin cushions	1. Cutting out of patterns and fabrics
(b) Seam ripper	2. Protect the fabric from direct contact with hot iron
(c) Pressing cloth	3. Hold spools and needles
(d) Dress making shears	4. Remove fine lines and single threads

B. Fill in the blanks

1. The measuring tape should be clean to check the _____ of the markings.
2. _____ is a hand tool for measuring small areas during sewing.

C. One word question and answers

1. What is the care and maintenance of sewing machine?
2. What are all materials required for sewing machine?

D. Long Answer

1. Describe the cleaning of the sewing machine.
2. Write about the oiling of the sewing machine.
3. Explain the safe handling procedure of the sewing machine.

Reference Link

- <https://www.thecraftygentleman.net/2020/04/14/how-to-clean-a-sewing-machine/>
- <https://ordnur.com/sewing/how-to-properly-take-care-of-your-sewing-machine/>

SESSION 2: SEWING DEFECTS AND ITS SOLUTIONS

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

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

Possible causes

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

Corrective action

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

2. Defect: Machine running heavily

Possible causes

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

Corrective action

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

3. Defect: The sewing machine does not run.

Possible causes

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

Corrective action

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

4. Defect: The upper thread breaks.

Possible causes

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

Corrective action

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

5. Defect: The bobbin thread breaks

Possible causes

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

Corrective action

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

6. Defect: Skipped stitches

Possible causes

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

Corrective action

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

7. Defect: Irregular stitches

Possible causes

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

Corrective action

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

8. Defect: Fabric puckers

Possible causes

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

Corrective action

- (i) Decrease the stitch length.
- (ii) Replace with a needle of good condition.

-
- (iii) Reset the thread tension.
 - (iv) Increase pressure on the presser foot.
 - (v) Use an underlay of tissue paper/backing.
 - (vi) The upper thread and bobbin thread should be of the same size and kind.

9. Defect: Bunching of Thread

Possible causes

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

Corrective action

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

10. Defect: Needle breaks

Possible causes

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

Corrective action

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

11. Defect: Threading cannot be done

Possible causes

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

Corrective action

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

Practical Exercises

Activity 1

Prepare each art of the sewing machine and sewing defects. Also mention the causes and remedies for the same.

Material Required

1. Chart sheet
2. Pen
3. Pencil
4. Eraser
5. Ruler
6. Markers

Procedure

1. List out the common defects in sewing and sewing machine.
2. Write the possible causes and list out the corrective action for the problems.
3. Prepare a chart.
4. Place the chart in the classroom/practical lab.

Activity2

Visit a garment manufacturing unit/workshop and attend a demonstration of the defects of the sewing machine and sewing, possible causes and its corrective action.

Material Required

1. Notebook
2. Pen
3. Camera (if available/mobile phones with camera)
4. Vehicle (bus) for field visit

Procedure

1. Visit a local garment manufacturing unit/workshop for the demonstration with the teacher.

- Attend a demonstration on the defects of a sewing machine and sewing, causes and corrective action by a technical expert.
- Prepare a report of the visit.

Check Your Progress

A Match the columns

(a) Poor thread quality	1. Remove bobbin and bobbin case and clean
(b) Tensions improperly set	2. Replace needle
(c) Dirt, lint, or thread in bobbin case	3. Replace poor thread
(d) Blunt or bent needles	4. Adjust tension

B. Arrange the jumbled words

(a) pdese	(e) fyaset	(i) apteroe	(l) niedwr
(b) polso	(f) nutlb	(j) ebuasilt	(m) iltn
(c) thustle	(g) psipdke	(k) cpkrues	(n) rsehe
(d) stfo	(h) kgbiacn		

- (a)Speed (f)Blunt (k)Puckers
 (b)Spool (g)Skipped (l)Winder
 (c)Shuttle (h)Backing (m)Lint
 (d)Soft (i)Operate (n)Sheer
 (e)Safety (j)Suitable

C. One word question and Answers

Write short notes on the following machine defects:

- Excessive noise while stitching
- Needle break
- Fabric puckering

D. Long Answers

- What are the common defects that occur while stitching?
- Write the causes and corrective action for the same.

Reference link

<https://www.slideshare.net/slideshow/sewing-defects-236927772/236927772>

SESSION 3: RISK AND HAZARDS IN INDUSTRY

Risk is a random incident that may possibly occur, and if it occurs, it would have a negative impact on achieving organizational goals. A hazard is an agent having the potential to cause harm or hurt to the target. We can call the possible source of danger as hazard. The terms 'risk' and 'hazard' are mostly used interchangeably. However, in terms of risk assessment, they are two very different terms. A hazard is any agent which can cause harm/damage/injury to human beings and their environment. Risk is defined as the probability that exposes one to a hazard which leads to a negative effect.

Type of hazards

In a garment manufacturing unit, all the hazards mentioned in this session may not be common, but a wareness about various hazards is essential to be able to deal with them in case they occur. Different work environments can pose different type of hazards and risks to the health of the Operators. Therefore, it is important to identify and address the different type of hazards with appropriate safety measures, not only by the employers but also for each individual to be responsible for the safety and welfare of the self, all persons working in the organisations as well as the environment. There is always a threat to the health and safety of people at the work place. These may be chemical hazards, physical hazards, biological hazards, etc. Here we have discussed some hazards keeping in mind the exposure of students of this course to wards machines and industry.

Physical hazards

They often affect many Operators in the work place, for example occupational hearing loss, postural defects, falls, accidents, etc. Hearing loss is one of the most common problems in a manufacturing unit with heavy noise-making machines like some industrial sewing machines or cutters; postural defects like cervical and bone shape change can occur if a person needs to sit or stand in a particular wrong position for long time. Accidents and falls are also a common cause of occupational injuries and deaths in industries, like transportation, construction, extraction, healthcare, building, etc.

Fire hazards

They are common in those industries that use a lot of flammable material, like cotton, chemicals, etc. Fire hazards occur mainly due to the following reasons.

1. Improper working of fire and smoke alarm bells in industries
2. Absence of fire and smoke alarm systems in many industries
3. Improper maintenance of fire exits or emergency stair case
4. Lack of proper exit route or emergency staircase to reach the place of safety
5. Every industry should keep fire extinguishers as a safety measure. (Fig.4.16)



Fig.4.16 Fire extinguishers

Biological hazards

These involve hazards due to bacteria, viruses and toxins. It can be due to non-airy and dark rooms, suffocation (bad ventilation), and unhygienic conditions of wash rooms. These also include animal bites and stings, problems from toxic plants, and transmitted diseases through animals.

Chemical hazards

Some chemical scan cause a hazard in the work area. There are many categories of hazardous chemicals. Certain chemicals are harmful when mixed with other chemicals. Chemical hazards are very common in apparel and textile industry while at the time of dyeing and printing. A worker in the garment industry should practice caution while handling chemicals. The worker must be made aware of the specific instructions to be followed while handling a particular chemical.

Psychosocial hazards

This means that the status of mental health and emotional well-being of the Operators in an organization may not be normal. These could be due to a feeling of job insecurity, long working hours, lack of enthusiasm towards work, frustration about not being allowed to deliver quality product due to pressure of quantitative production, harassment at workplace and poor work-life balance. This aspect should be dealt with care, as these are sensitive issues. Behavioral therapy, like continuous counseling, meditation, yoga, participation in recreation centers, music therapy or occupational care are effective in reducing sick leave days and poor work efficiency at the work place.

Electrical hazards

These are common in the textile industry as fabrics, machines and other fire-prone equipment are being dealt with here. It is quite dangerous when an Operator creates an electrical contact with keyed up equipment or a conductor. Electrical accidents mostly occur when the individuals are working around electrical apparatus which is live but they think it is dead. Wrong use of equipment and use of faulty electrical equipment also causes accidents. Working on, or near electric equipment, without adequate training or appropriate equipment, may be one of the reasons.

Table 4.1: Some Common Hazards and Potential Accidents and their Preventive Measures

Common hazards	Preventive measures
Finger and hand injury during cleaning and repair work	The machine must be switched off, with the plug removed, and must be stationary before any cleaning or repair work is started.
Eye injury from broken parts accidentally entering the eye	Proper adjustment of the eye guard should be checked before work starts. Safety glasses should be used.
Finger injury from the needle	Setting of the finger guard should be checked before work starts
Injury from tools and equipment of drafting cutting and measuring tools	Shears and needles should be put at the right place after use.
Electrical injury	Never use a machine with damaged covers, cables, switches, etc. Report the damage at once. Never try to repair it yourself.
Internal injury from accidentally swallowed items	Never store items temporarily in the mouth. Place needles, etc., in suitable containers.
Tripping and falling in the surrounding work area	The work area must be clean and tidy.
Fire hazards: loss of life and damage to machinery due to electric short circuit or welding operation	Place MCB (Motor Circuit Breaker), ACB (Air Circuit Breaker), restrict unauthorized person for welding

Practical Exercises

Activity1

Prepare a chart of the hazards in the garment manufacturing industry.

Material Required

1. Pen
2. Glue
3. Chart sheet
4. Pictures of hazards related to the garment manufacturing industry

Procedure

1. The teacher should arrange to make the students watch a short video on the hazards in industry and safety measures.
2. The teacher should organize a group discussion regarding the same.
3. Following the instructions of the teacher, prepare a report on the hazards in the industry and the safety measures.

Check Your Progress

A. Find the following words from the maze below

HAZARD, MACHINE, INJURY, ELECTRICAL, ACCIDENT, ALLERGY,
DAMAGE, RISK, HURT

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

B. Fill in the blanks

1. There is always a threat to the _____ and _____ of people at work place.
2. _____ and _____ problem caused due to excessive dust.
3. _____ is required for demonstration of work technique.

C. One word Question and Answers

1. What is industrial hazard?
2. How do we prevent physical hazards?
3. Write the common hazards in industries?

D. Answer the following questions

1. Explain any 4 hazards in sewing industries.
2. Explain risk and hazards in industries.
3. Describe the hazards and preventive measures in industry

E. Long Answers

1. Define the risks and hazards in the garment manufacturing industry.
2. List out the type of hazards in the garment manufacturing industry.
3. How can the management reduce the risks and hazards in the garment manufacturing industry?

Reference link

<https://www.ncert.nic.in/vocational/pdf/ivsm105.pdf>

<https://www.indeed.com/career-advice/career-development/types-of-hazards>

Unit-5 Home Furnishing

Session	Topic	Outcomes
4	House hold Linens Classification and Types of House hold Linen	At the end of the lesson, the students will be able to: ► Classify house hold linen into different categories. ► Understanding importance of textiles used in the home and clothing ► Create a set of curtains or drapes using a sewing machine and basic sewing techniques.

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SESSION 1:HOUSE HOLD LINENS CLASSIFICATION AND ITS TYPES



Home textiles can be defined as the textiles used for home furnishing. It consists of a various range of functional as well as decorative products. The fabrics are used for home textiles consists of both natural and man-made fibers. Sometimes we also blend these fibers to make the fabrics stronger. Generally, home textiles are produced by weaving, knitting, crocheting, knotting, or pressing fibers together. Made-ups refer to the article manufactured or stitched from any type of fabric, other than a garment. The textile fabrics most commonly used for home furnishing may be listed as Silk, Cotton, Jute, Rayon, Wool, Nylon, Polyester, Satin, etc.

Different types of Home Textile Products are given below:

1. Bed Textiles
2. Window Textiles
3. Table Linen
4. Kitchen Linen
5. Floor Covering

1. Bed Textiles

Bed textiles include bed sheets and pillow cases, bed spreads, quilt covers, duvet covers, cushions, blankets, mattresses, bed throws, sofa throws and many other items. For bed sheets, bed spreads and similar items, mostly acrylic, viscose, silk and blends are used. For blankets wool, acrylic fiber, and acrylic polyester fiber blends are used extensively. (Fig.5.1)



(Fig 5.1)

2. Window Textiles

Window textiles may include curtains, drapes, blinds etc. This is probably the widest area of fabric development in home textiles. Mostly cotton, flax, wool, silk, acrylic, etc. are used for the purpose. Blinds are opaque window textiles. Some blinds allow transmission of a little light into the room where as the others usually made of cotton fabric, known as black out material, give 100 percent opacity. (Fig 5.2)



(Fig, 5.2)

3. Table Linen

The table linen refers to the cloth and napkins that are put on a table for a meal. It includes table mats, napkins, place mats, chair covers, chair mats and pads, table runners, coasters etc. For table cloths, fabrics like cotton, linen, polyester, etc. are extensively used. Jute, leather, plastic, silk and satin are also used widely for other items like place mats, chair mats, table runners etc. (Fig.5.3).



(Fig 5.3)

4. Kitchen Linen

Kitchen linen includes aprons, mittens, dishcloths, kitchen towels etc. Cotton fabric, leather and plastic, are mostly used for making kitchen wear aprons. Flame retardant kitchen wears are also in great demand these days. (Fig.5.4)



(Fig.5.4)

5. Floor Coverings

Floor covering is a term to Rugs and carpets are very important part of floor covering which has gained worldwide popularity. A part from traditional woolen and silk carpets, other categories like coir carpets, hand knotted and jute carpets have a good market share. (Fig5.5) The choice of material for floor covering is affected by factors such as noise, insulation, comfort and cleaning effort.



(Fig.5.5)



(Fig.5.6) HOUSE HOLD LINENS

Practical Exercises

Activity 1

- ☐ Prepare a table cloth / pillow covers by using block printing and stencil printing.
- ☐ Prepare a pair of pillow covers / curtains for house hold purpose.

Check Your Progress

A. Choose the correct answers

- 1) The textile fabrics most commonly used for home furnishings.
a) Silk b) Rayon c) Nylon d) all of the above
- 2) They allow transmission of little light into rooms.
a) Blinds b) Curtains c) Napkins d) Kitchen towels
- 3) Viscose, silk and blends are used for _____ textiles.
a) Bed textiles b) window textiles c) Floor linens d) Table linens

B. Fill in the blanks

- 1) _____ plays a major role by turning the neutral spaces into personal places.
- 2) The fabrics are used for home textiles consists of _____ & _____.
- 3) _____ and _____ car pets are hand knotted materials used in home textiles.

C. Match the following

A	B
1 Bed textiles	Drapes
2 Window textiles	Mattresses
3 Table linen	Rugs
4 Kitchen linen	Table cloths
5 Floor coverings	Apron

D. One word Question and Answers

- 1) What are the home textiles?
- 2) Enlist the classification of linens.
- 3) Write the importance of home furnishings.

E.. Long Answers

- 1) Describe the uses of home textiles.
- 2) Explain the bed textiles and floor coverings.
- 3) Write the short note on home textile products.

Reference link

- ▶ <https://www.slideshare.net/slideshow/classification-of-linens/225695508>
- ▶ <https://www.scribd.com/document/437310451/Different-Kinds-of>

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GLOSSARY

Abrade: to rub hard or scrub, or wear away by friction or erosion

Abrasion: the process of rubbing or grinding away the surface of a fabric by friction

Anticlockwise: in the opposite direction to the way in which the hands of a clock move round

Bearing: it is a part of a machine that supports another part that turns around.

Blunt: not having a sharp edge or point

Clockwise: in the direction of the typical forward movement of the hands of a clock

Clog: a blockage due to a piling up of some material

Coarse: rough in texture

Conformation: it is the manner of formation/structure/form or as of a physical entity

Dab: to press lightly in a repeated motion with a soft object, without rubbing

Damp: make something slightly wet

Debris(here): the remains of sewing material

Deflecting: a changed direction, or the turning a side of the yarn from a straight course after hitting

Descend: to pass from a higher to lower place or to move downwards

Durability: continuing to be used without getting damaged

Ergonomic: relating to or designed for efficiency and comfort in the working environment

Fasten: secure the end of a thread with stitches or a knot

Fray: the wearing out of the fabric at the edge due to friction or constant rubbing

Indentation: a notch on the edge or surface of something (needle)

Intricate: very complicated or detailed, having a lot of small parts that are arranged in a complicated or delicate way

Latch: a fastening that has a bar fitted into a slot and is lifted by a lever or a string from either side

Lingerie: women's undergarment or the clothing worn in bed or sleep wears

Lint: short, fine fibers which separate from the surface of the fabric or yarn during processing. It may be the minute shreds or unravelings of yarn or bits of threads.

Locknut: a nut so constructed that it locks itself when screwed tight against another part

Lubricate: to apply a substance such as oil or grease to (an engine or component) so as to minimize friction and allow smooth movement

Pliable material: the material flexible enough to bend freely or repeatedly without breaking

Point: the part of the needle that makes the first contact with the fabric and is responsible for how the needle pierces the fabric

Pressing: apply pressure to (something) to flatten, shape, or smooth it, typically by ironing

Ravel: it is a thread from a woven or knitted fabric that has frayed. It means to become disjoined thread by thread or fiber by fiber, or fraying

Reservoir: a place for storing liquid

Resilience: the ability of a fabric to spring back to its original shape after being twisted, crushed, wrinkled or distorted in anyway

Rotary hook: the part which enters a loop or needle threads, and carries it around the bobbin case to form the lock stitch

Scrap: a small piece of left over fabric after the greater part has been used

Serrated edge: an edge lined with small teeth

Shaft: a part of the needle between the eye and the point. It is a suitable length for driving the eye and thread through the material

Sheen: a soft shine on a surface or a smooth and gentle brightness of the surface. It is a quality of things that are shiny, usually with reflected light

Slack: not taut or held tightly in position, or loose

Spill: the unintentional flowing of a liquid over the edge of its container

Taper: reduce in thickness towards one end

Termination point: the action of coming to a close or end

Thumbscrew: a type of screw, the head of which is so constructed that it may be turned easily with the thumb and a finger

Turning: it is the movement in a circular direction wholly or partly round an axis or point. when moved something so that it is in a different position. It is the actor course of one/something that turns a place of a change in direction.

Woodenawl: a handy tool for piercing holes for rivets, snaps, eyelets, etc.
