Clothing Production

Lecture 2
Sewing process and Production System

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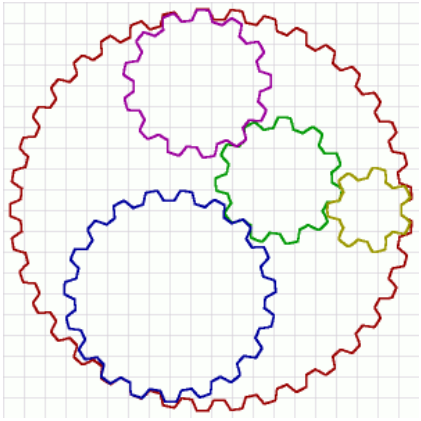
Machine:

A machine is a tool that helps a person to do something by using or changing energy



Definitions of sewing :

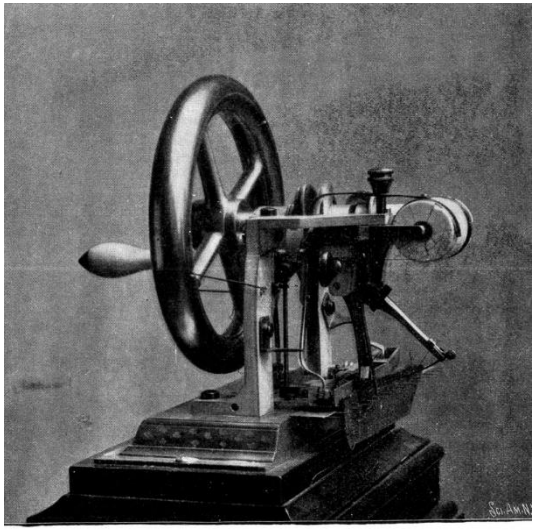
Sewing or stitching is the fastening of cloth, leather, furs, and other flexible materials, using needle and thread.

Sewing Machine:

Any mechanical or electromechanical device used for fastening of cloth, leather, furs, and other flexible materials, using needle and thread.

History:

1790:The first workable sewing machine was invented and patented by the British inventor Thomas Saint.,
Limitation:*thread has to go all the way in the fabric with needle and mechanical fingers were used,*



THE ELIAS HOWE MACHINE, SEPTEMBER 10, 1846.
Earliest model filed in Patent Office.

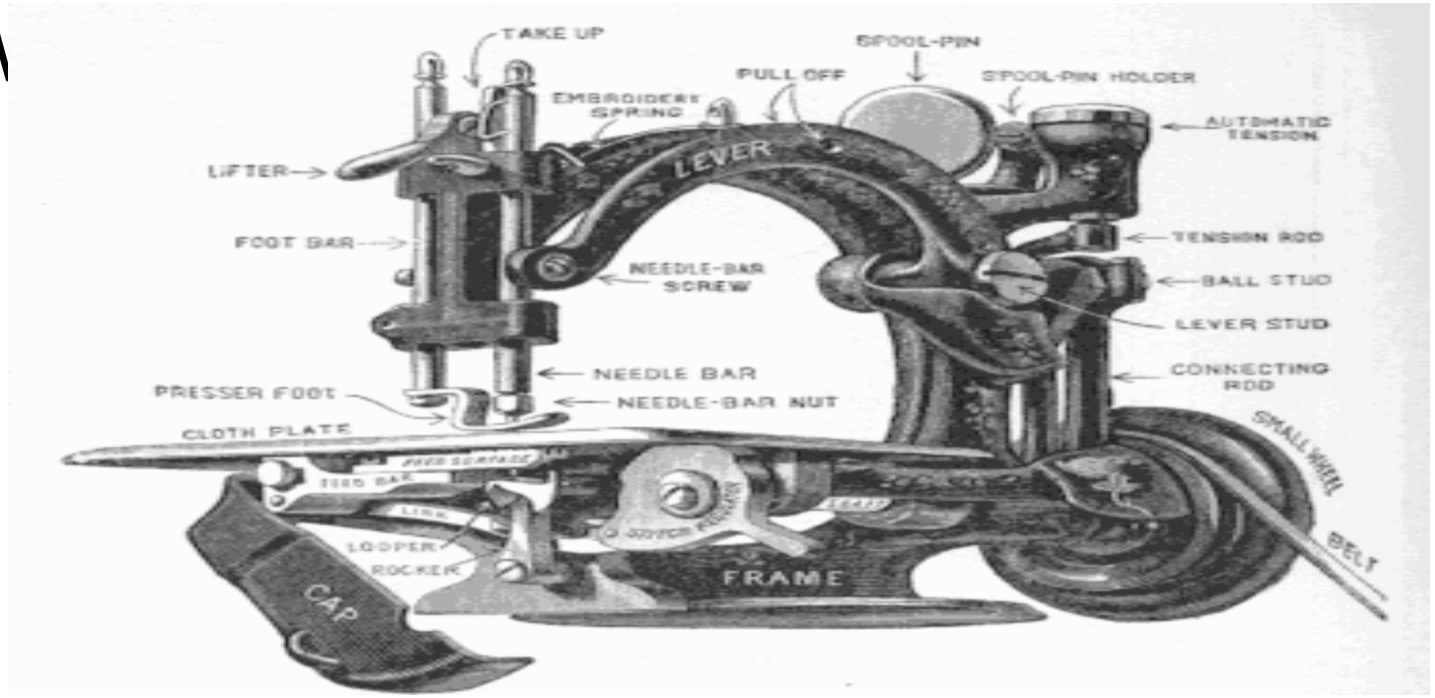
1830 : French tailor, Barthelemy Thimonnier (1793-1857), patented the first practical sewing machine.

1834 :The earliest idea for a double-thread sewing machine came from Walter Hunt (1796-1860) of New York in 1834.

In 1851, Issac M. Singer (1811-75) patented the first rigid-arm sewing machine.

1856:The sewing machine combination was formed consisting of Singer,Howe,Wheeler& Wilson and Grover &Baker,

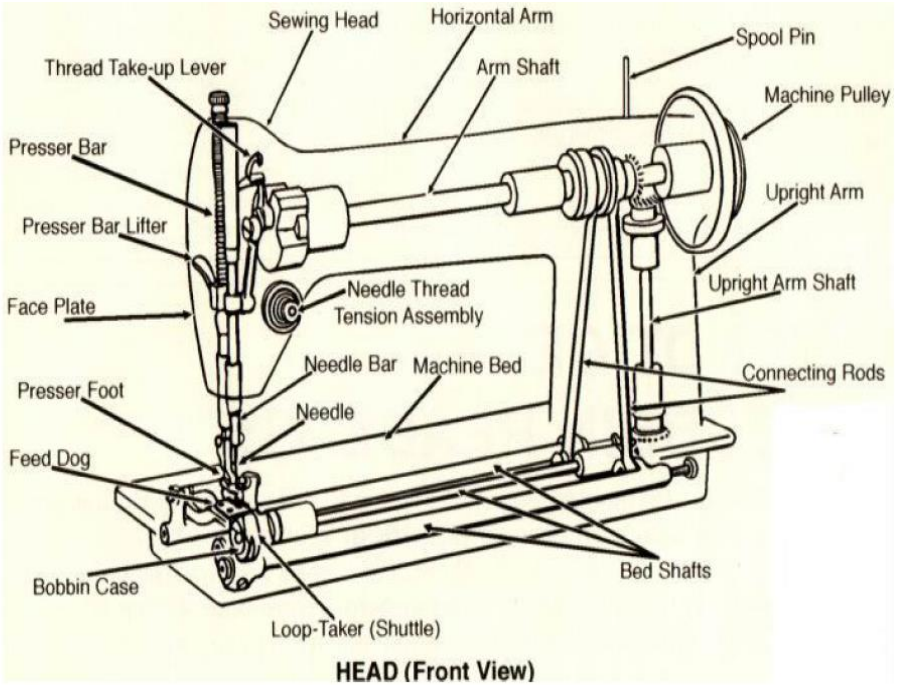
Other known names in the sewing machine history are Allen Wilson(reciprocating shuttle),W



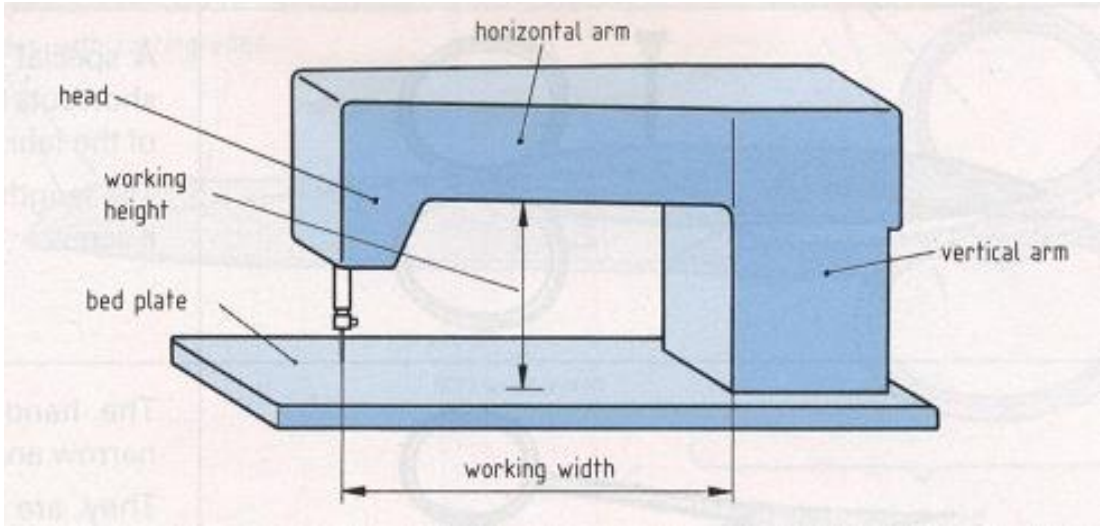
Sewing Machine Fundamentals

The major components of a basic sewing machine are :

I. Casting
II. Stitch- forming system
III. Feeding system
IV. Lubrication system



Casting


horizontal arm
head
working height
vertical arm
bed plate
working width

Stitch forming system

Stitch forming system are the mechanical parts that, when correctly synchronized, form stitches and sew seams.

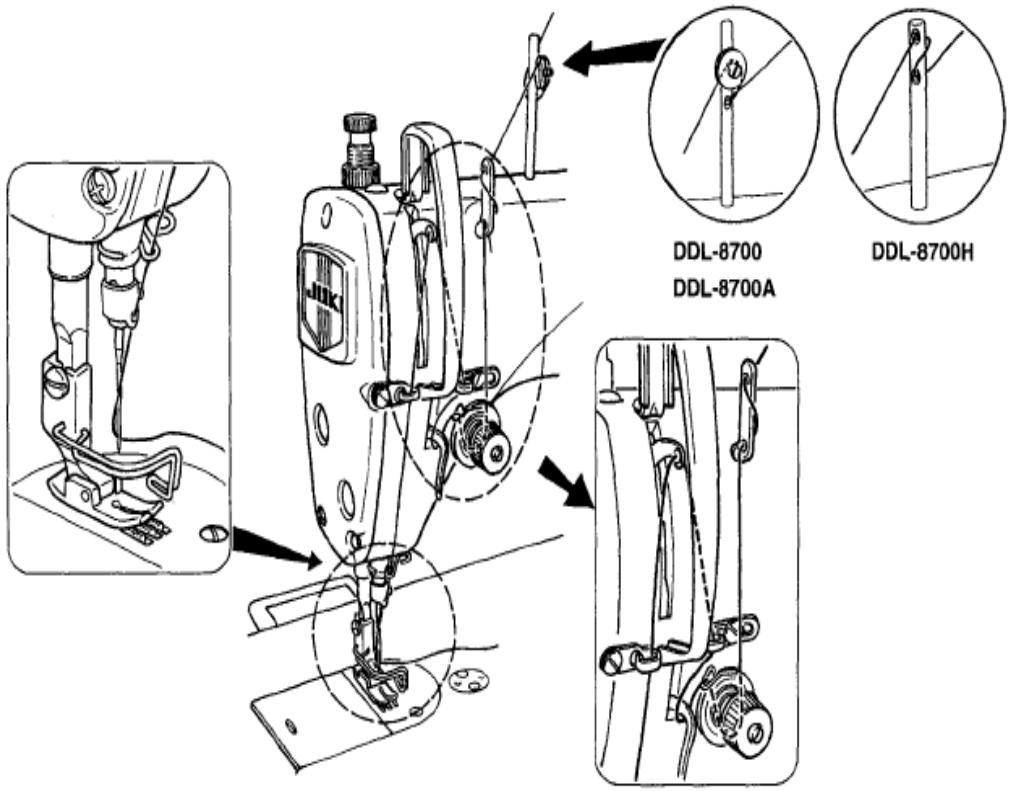
i. Thread control devices
ii. shuttle
iii. Needles
iv. Looper
v. Spreader

Stitch forming system

i. Thread Control Devices:

Thread control devices include:

a. Thread guides
b. Tensioning devices
c. Thread take up

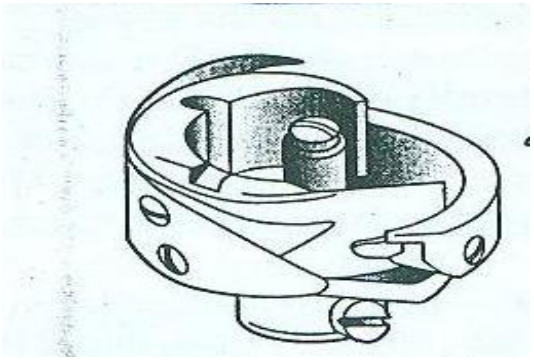


Stitch forming system

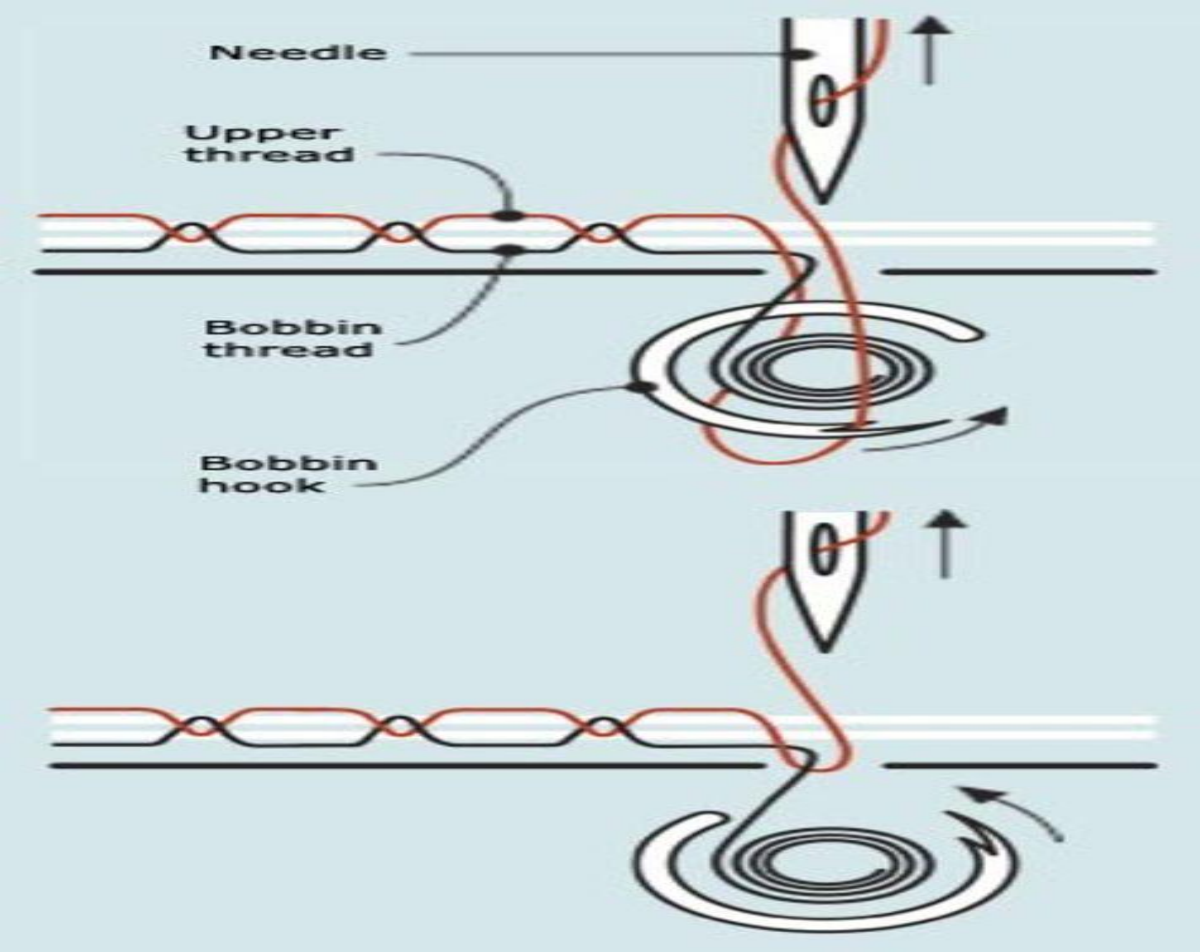
ii. Shuttle:

A rotating device that picks up

needle thread loop to form lock stitch.

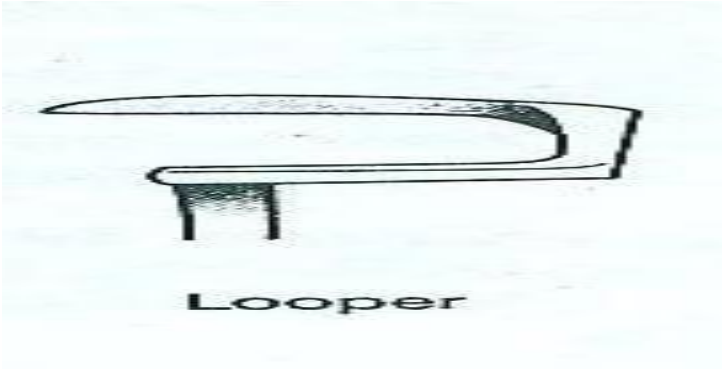


Stitch forming system



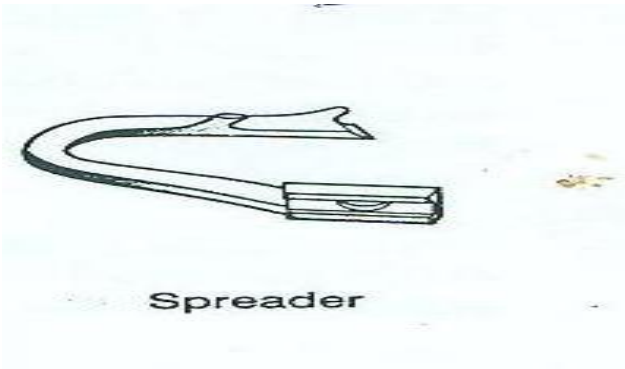
Looper:

Lopper may or may not carry the lower thread in the formation of stitch



Spreader

Spreader work in conjunction with a lopper to assist in the loop formation.



Feeding system

The material handling components of the machine are often referred to as feeding system. The feeding system controls fabric movement.

It consist of three parts

i. Presser foot
ii. Throat plate
iii. Feed mechanism

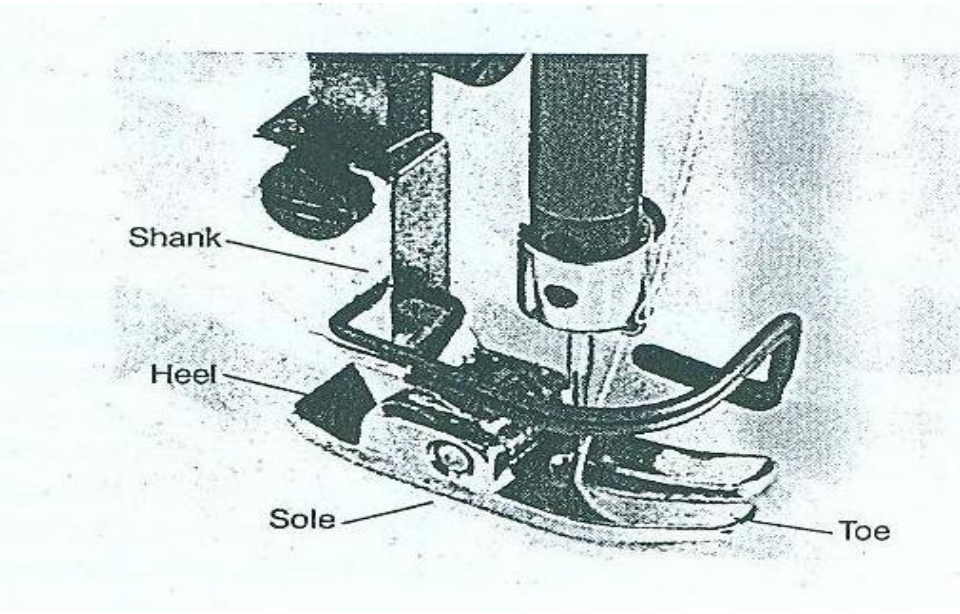
Feeding system

i. **Presser Foot:**

It is the upper part of the feeding system responsible for applying pressure and holding fabric

Parts of presser foot

a. **Shank**
b. **Heel**
c. **Sole**
d. **Toe**



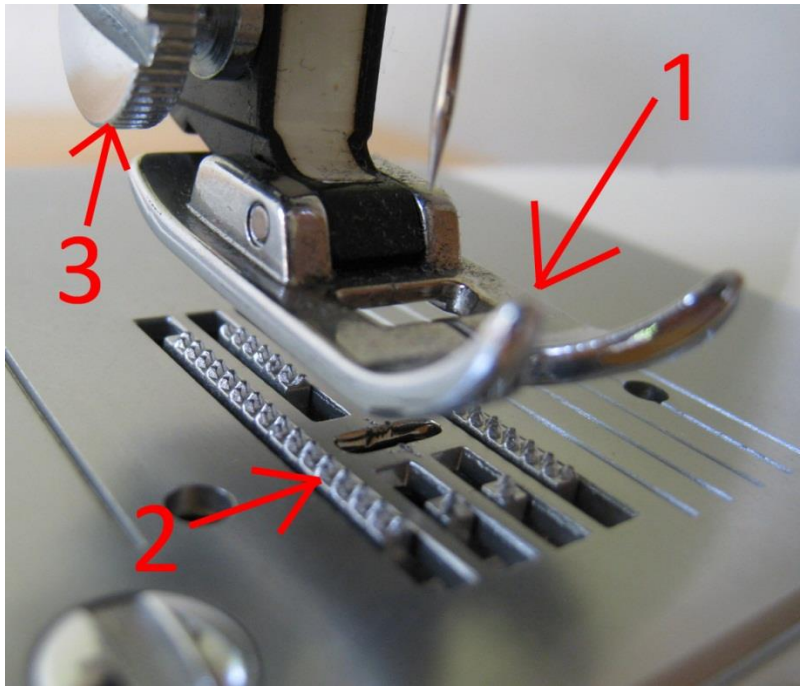
Feeding system

ii. Throat Plate:

These are metal plates directly under the needle. Throat plates support the fabric as needle penetrates to form stitch.

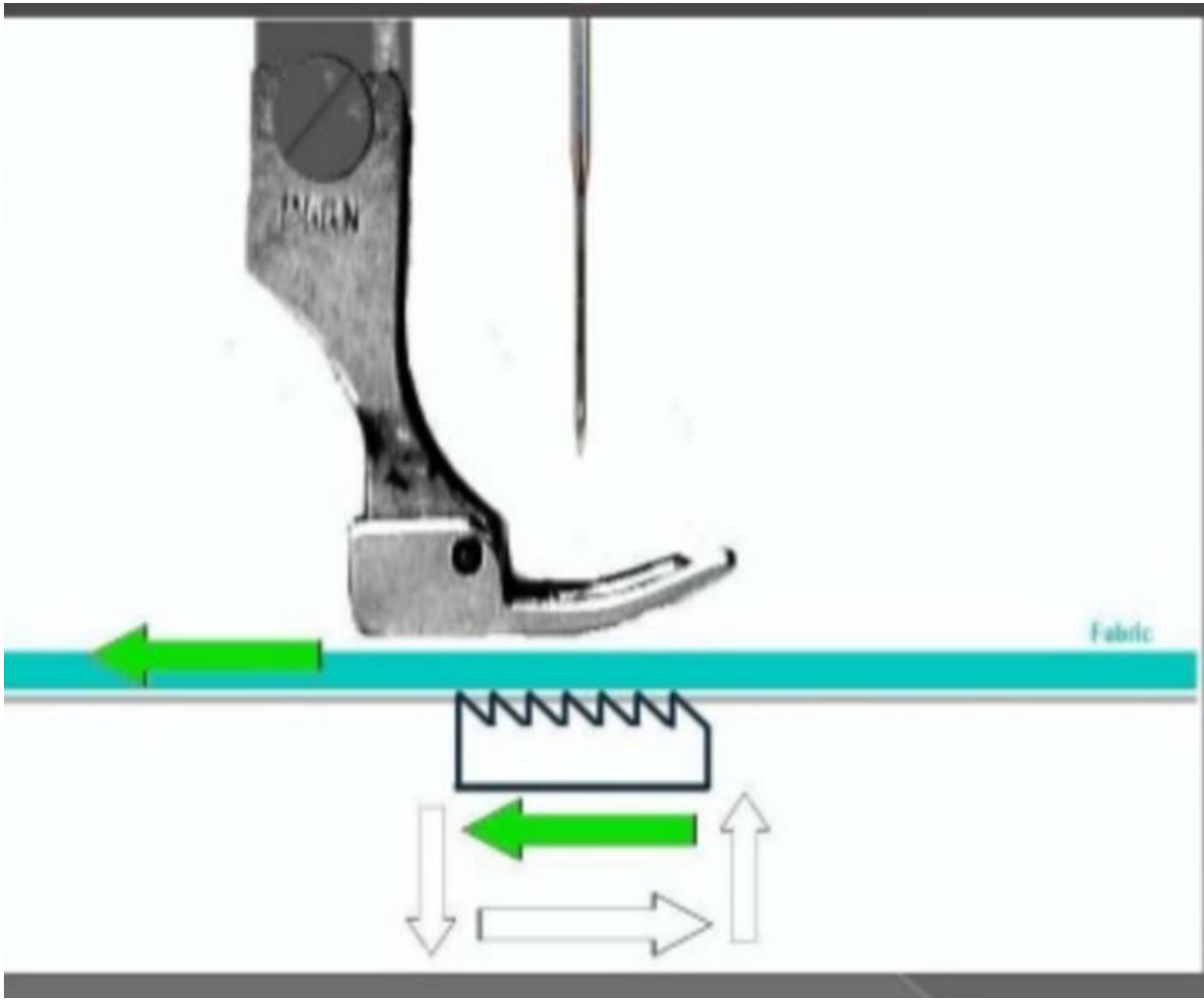
Throat plates have openings for needles and lower feed devices.

- **Types of feeding mechanisms:**
  - **I. Bottom feed or drop feed**
  - **II. Differential feed**
  - **III. Needle feed**
  - **IV. Unison feed**
  - **V. Puller feed**
  - **VI. Clamp feed**



Sewing Machine Fundamentals

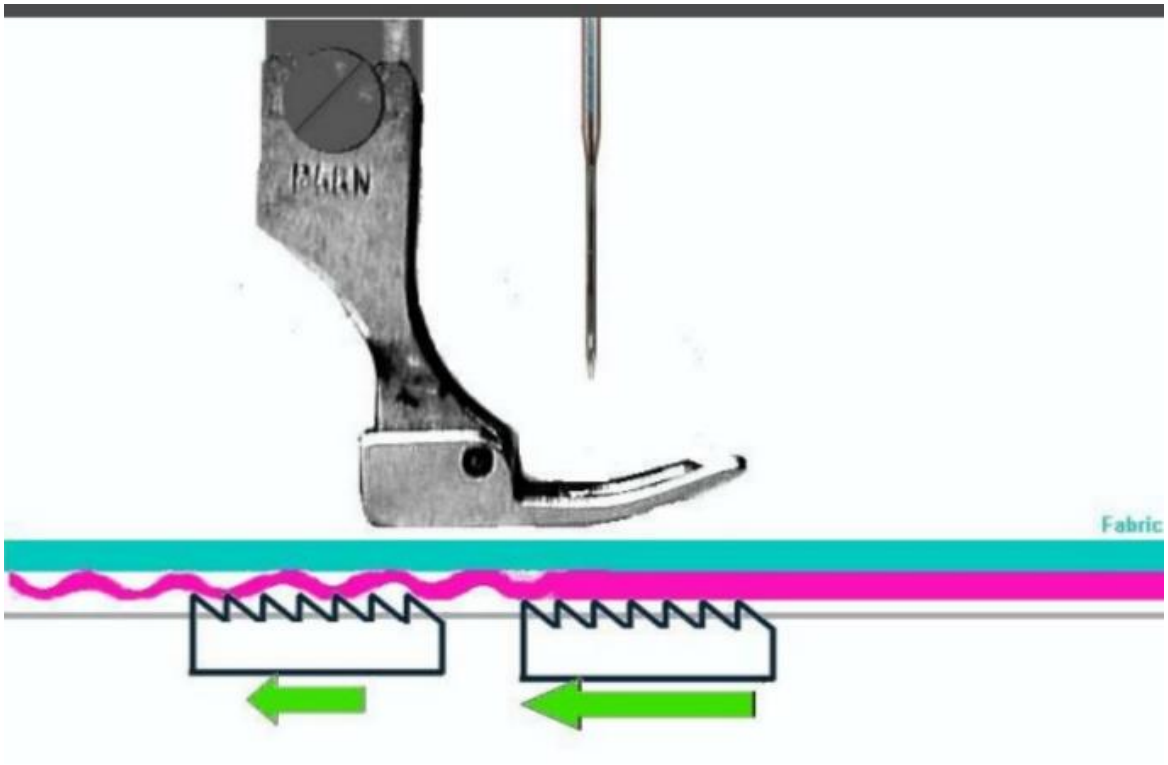
- **Bottom Feed or drop feed:**
  This is the most standard feed
  mechanism, which feed the
  material with lower feed dog
  only.



Sewing Machine Fundamentals

- **Differential feed:**

  In this feed mechanism, feed dog is divided into front and rear. Used in overlock machine. This is suitable for…..

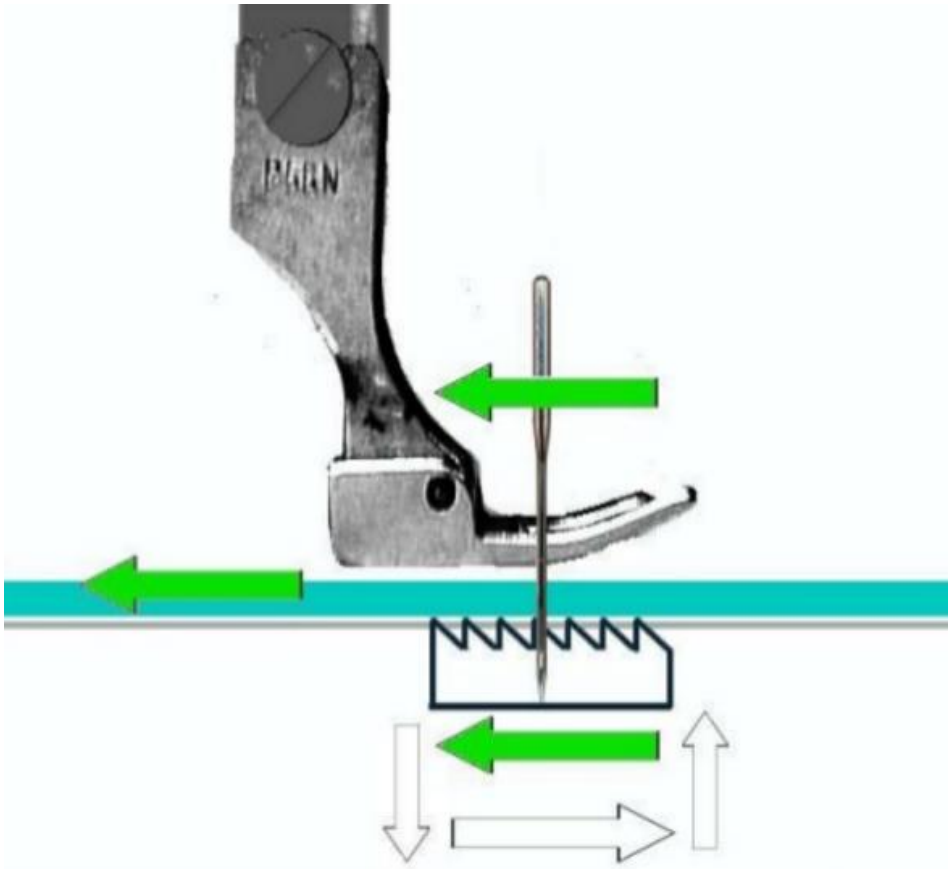


Sewing Machine Fundamentals

- **Needle feed:**

  In this feed mechanism needle bar moves in synchronization with bottom feed.

  This feeding force is strong as compared to bottom feed

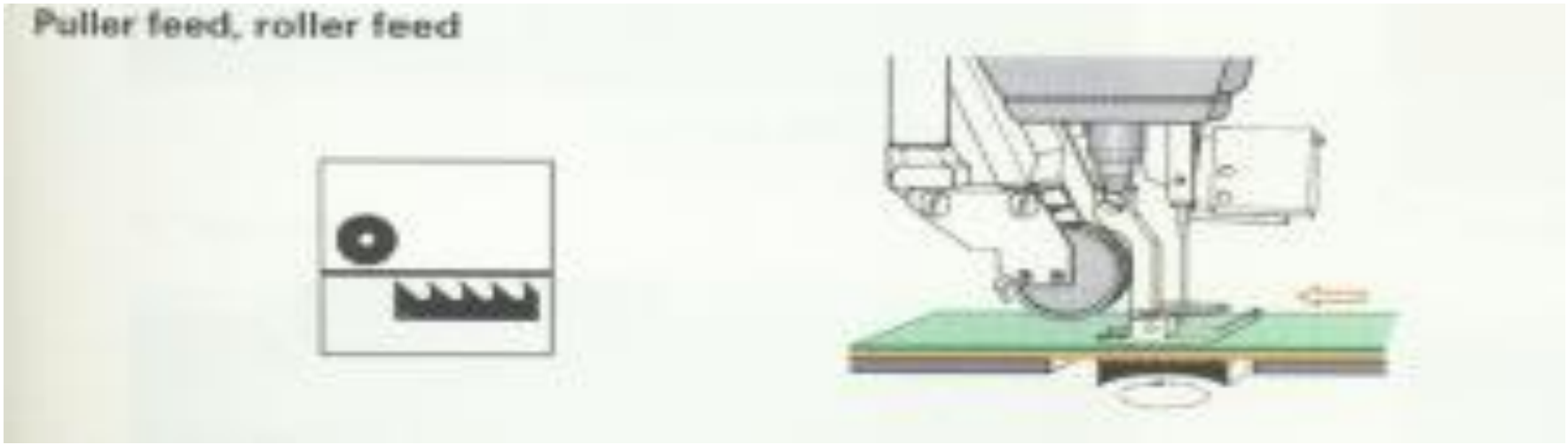


Sewing Machine Fundamentals

- **Puller Feed:**

  Roller located in the rear of presser foot pulls material and sewing is performed. Uneven material feeding is reduced and working is improved.

  Suitable for long straight seams as in bed sheets.

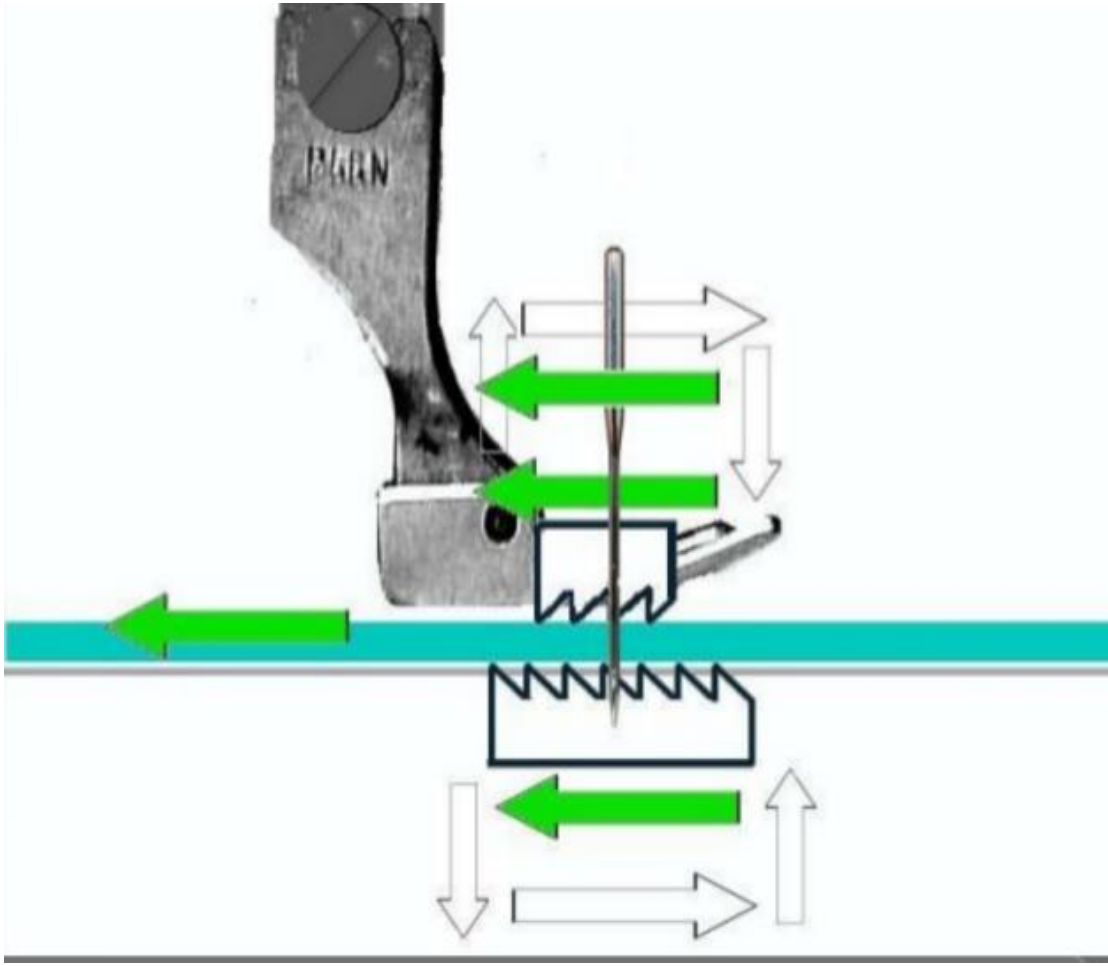


Sewing Machine Fundamentals

- **Unison Feed:**

  This is most superior feed mechanism. It is combination of bottom feed and needle feed.

  Suitable for sewing…..



Walking Foot

- **For compressible cushion materials**

Classification of Sewing machines

Sewing machines can be classified or categorized by

Type of use

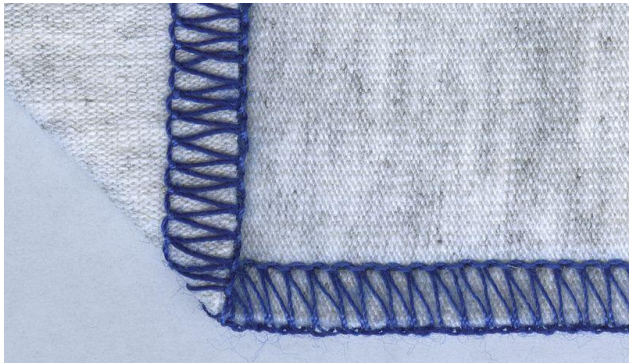
(leather, button hole, carpet,etc ..)

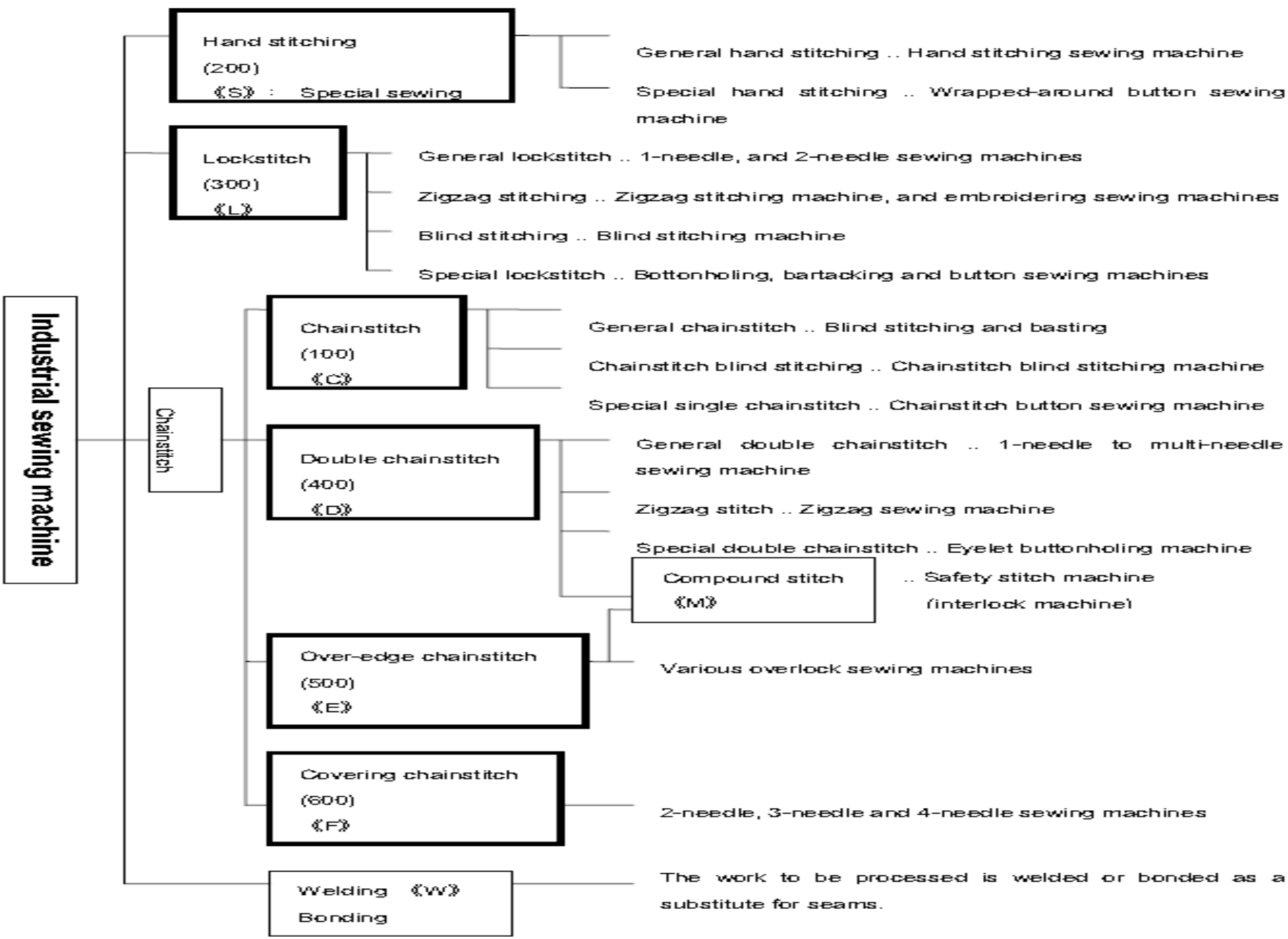
Bed shape

(cylinder bed,flat bed,post bed, et

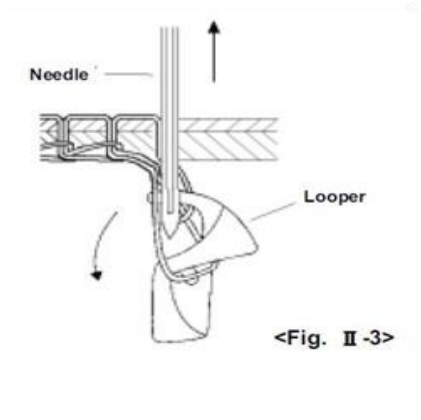
Stitch formation

(chain stitch ,lock stitch etc)

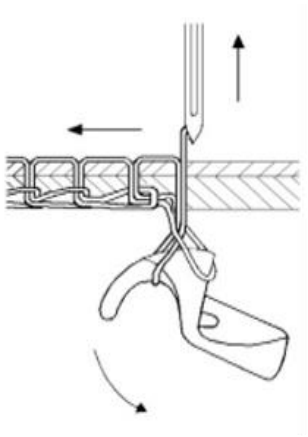


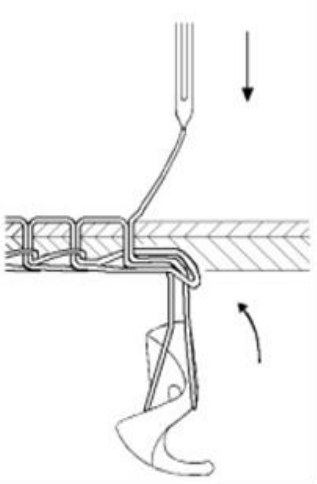

Industrial sewing machine
Chainstitch
Hand stitching
(200)
《S》 : Special sewing
General hand stitching .. Hand stitching sewing machine
Special hand stitching .. Wrapped-around button sewing machine
Lockstitch
(300)
《L》
General lockstitch .. 1-needle, and 2-needle sewing machines
Zigzag stitching .. Zigzag stitching machine, and embroidering sewing machines
Blind stitching .. Blind stitching machine
Special lockstitch .. Bottonholing, bartacking and button sewing machines
Chainstitch
(100)
《C》
General chainstitch .. Blind stitching and basting
Chainstitch blind stitching .. Chainstitch blind stitching machine
Special single chainstitch .. Chainstitch button sewing machine
Double chainstitch
(400)
《D》
General double chainstitch .. 1-needle to multi-needle sewing machine
Zigzag stitch .. Zigzag sewing machine
Special double chainstitch .. Eyelet buttonholing machine
Compound stitch
《M》
.. Safety stitch machine
(interlock machine)
Over-edge chainstitch
(500)
《E》
Various overlock sewing machines
Covering chainstitch
(600)
《F》
2-needle, 3-needle and 4-needle sewing machines
Welding 《W》
Bonding
The work to be processed is welded or bonded as a substitute for seams.

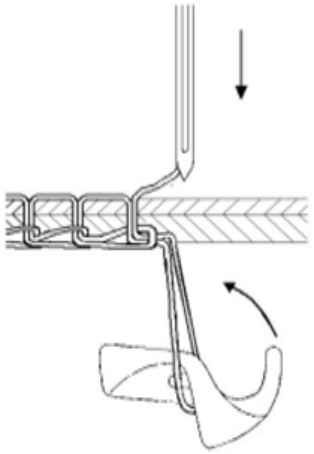
Class 100 - Chainstitch



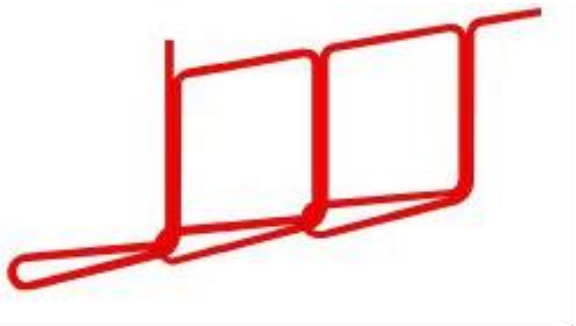
<Fig. Ⅱ-3>







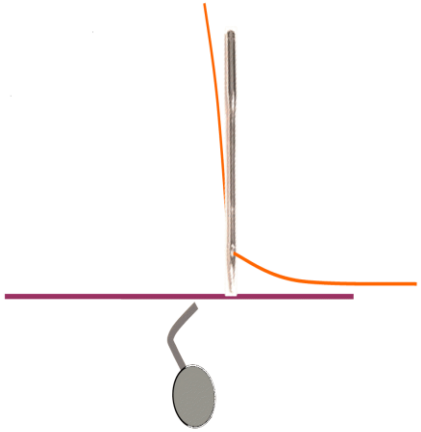
Stitch Type - 101

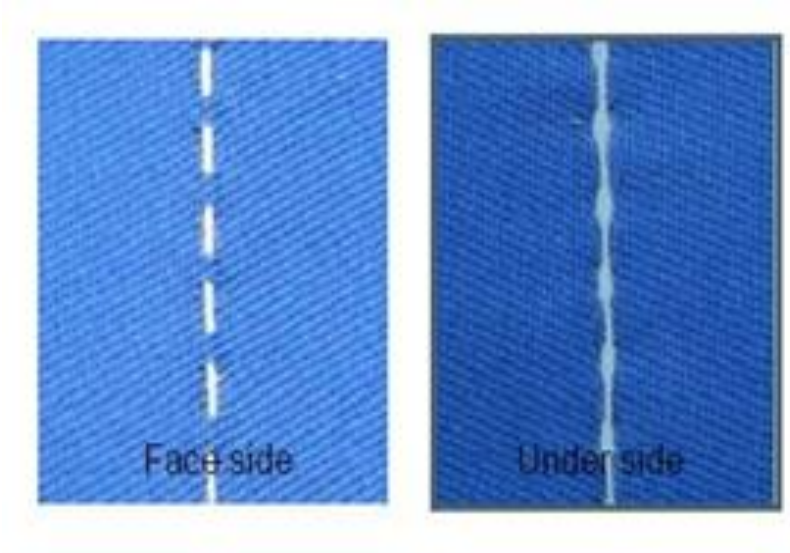


Approximate Seam length:Thread

Consumption ratio = 1:5

Single thread chainstitch’s are often used for





Class 200 - Hand Stitch

This type of stitch is formed with one thread. It is a machine made version of traditional hand stitching

sometimes referred to as Saddle Stitch.

Applications of Hand Stitch

Decorative stitch of suits or the like Kimono

ess) But

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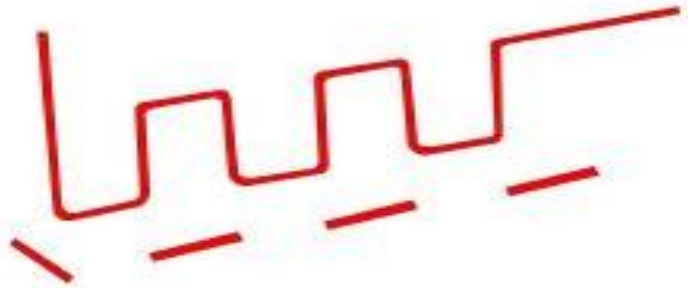
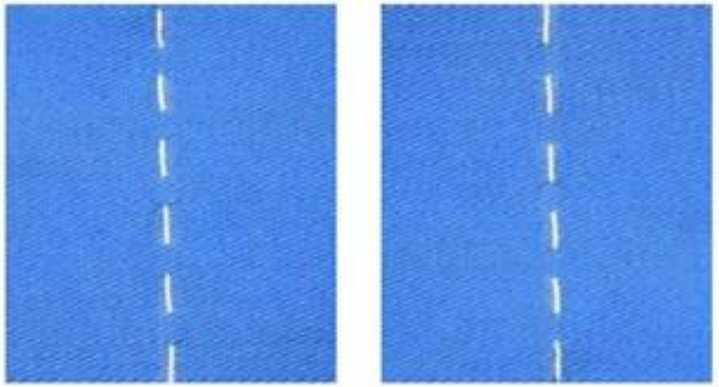
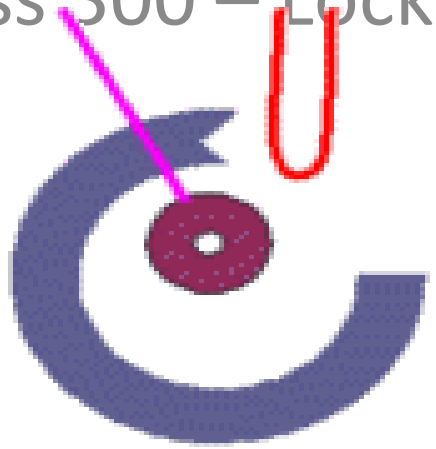
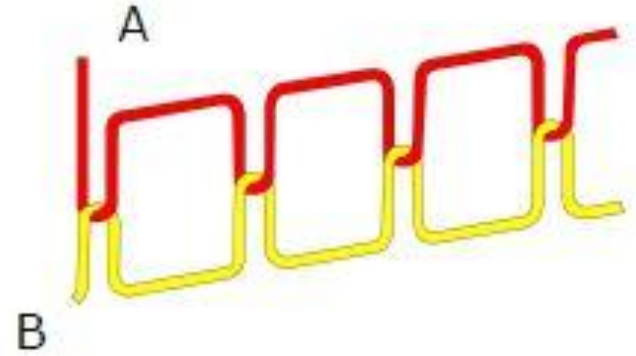


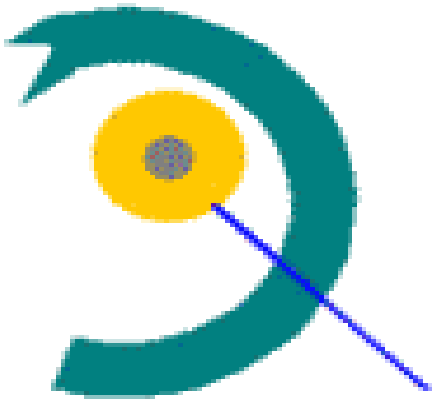


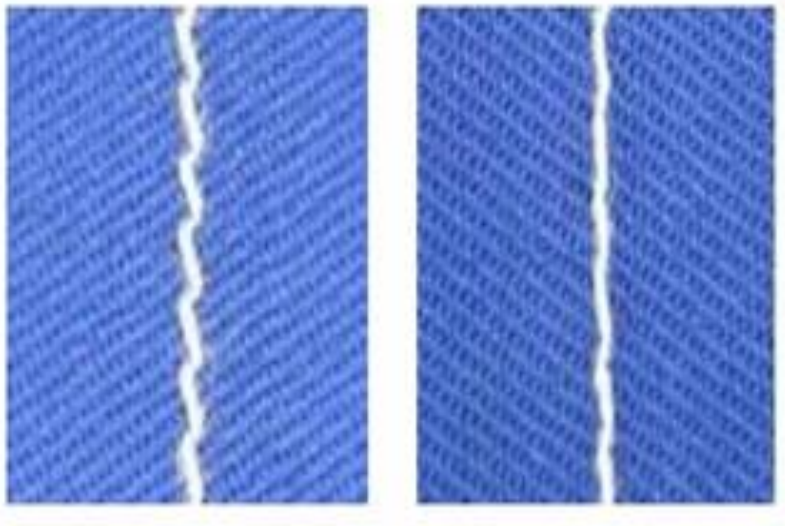
3) Class 300 – Lockstitch

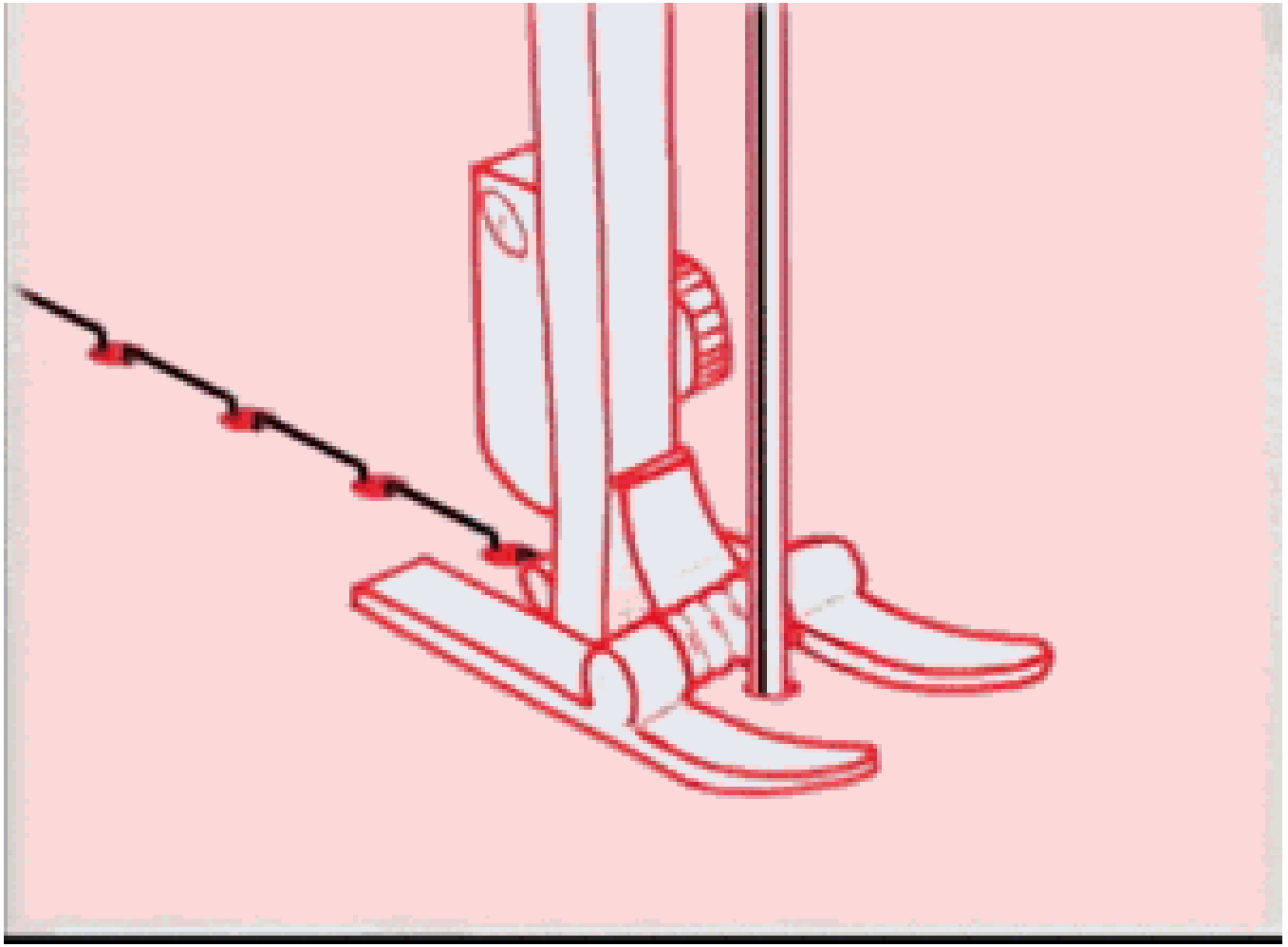




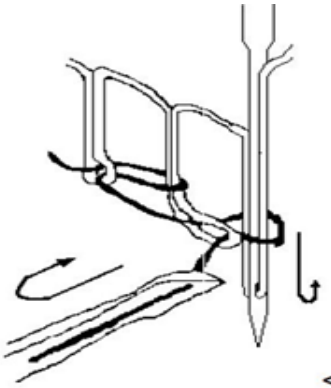
3) Approximate Seam:Thread consumption ratio – 1:2.5 for stitch type 301



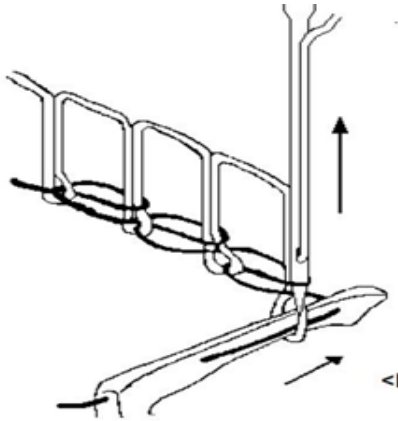




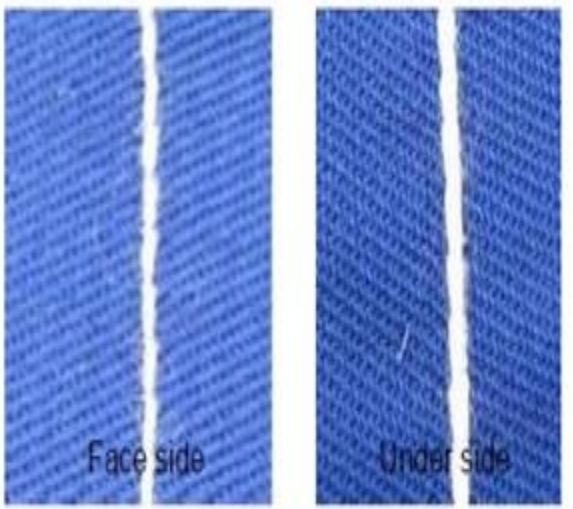
4) Class 400 - Double Chainstitch

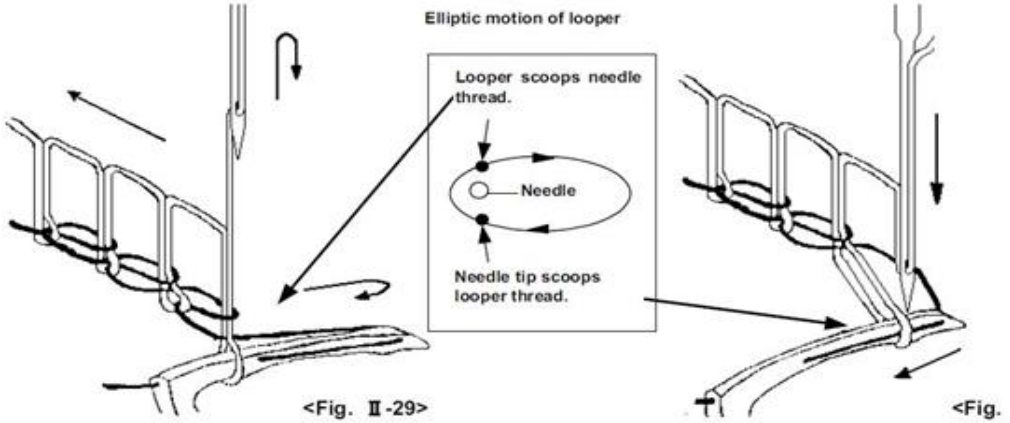


<Fig. Ⅱ-27>

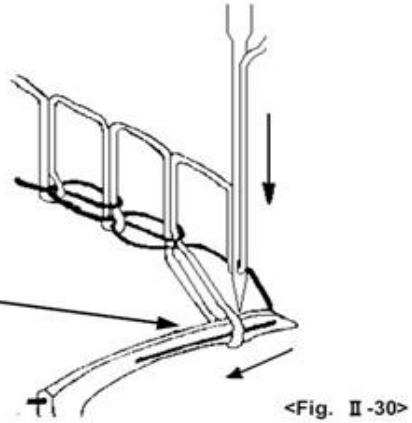


<Fig. Ⅱ-28>

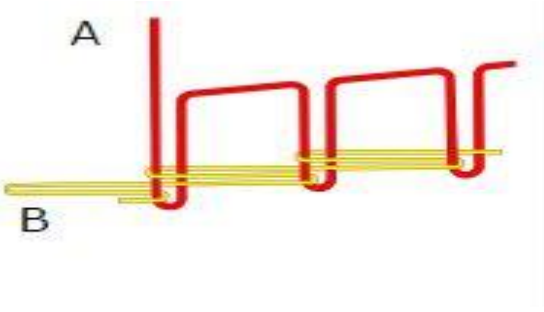




<Fig. Ⅱ-29>



<Fig. Ⅱ-30>

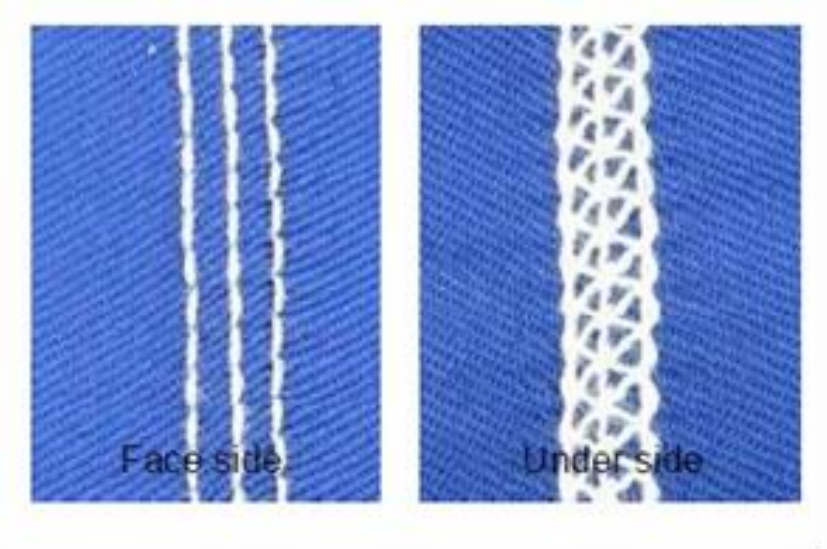


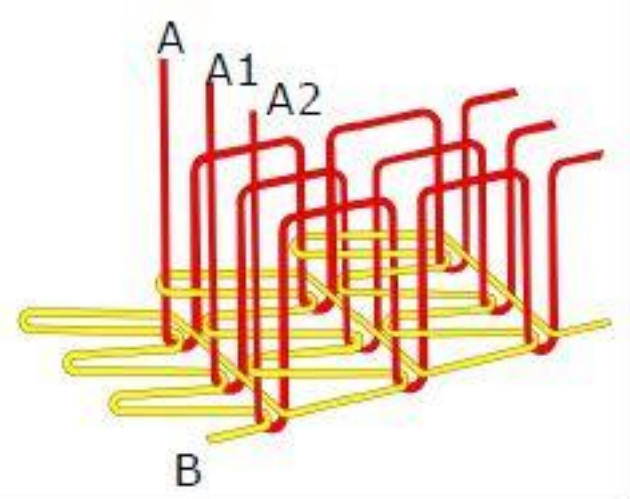
For class 401.

Approximate Seam:Thread consumption ratio = 1:5.5

Stitch Type – 407

Approximate Seam:Thread consumption ratio = 1 : 20



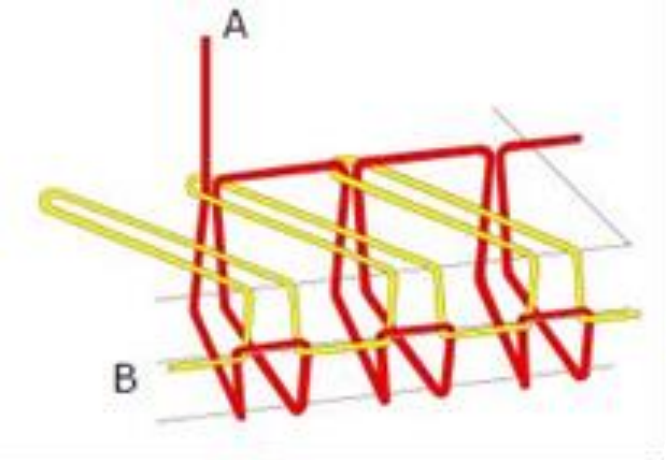


Applications of Double Chainstitch

General sewing (MH-481-5) Rubber tape attaching, Lace attaching to underwear, swim-suit, etc., Eyelet buttonholing (MEB-2688), Side seam (MS-1190), Belt loop making (MFB-2600).

Class 500 - Over-edge Chainstitch

Stitch Type – 503:Approximate Seam:Thread consumption ratio = 1:10.5



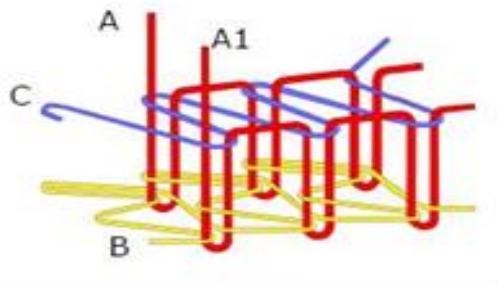
Cloth which is largely expanded, blind over-edging, prevention of fray at material end (ASN-397/serging machine), Overlock sewing machine (MO-3904, Cylinder-bed overlock sewing

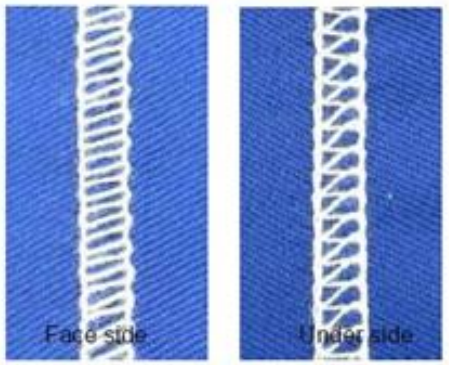
machine (MOC-3914).

Class 600 - Covering Chainstitch

Approximate Seam:Thread consumption ratio = 1:20.0

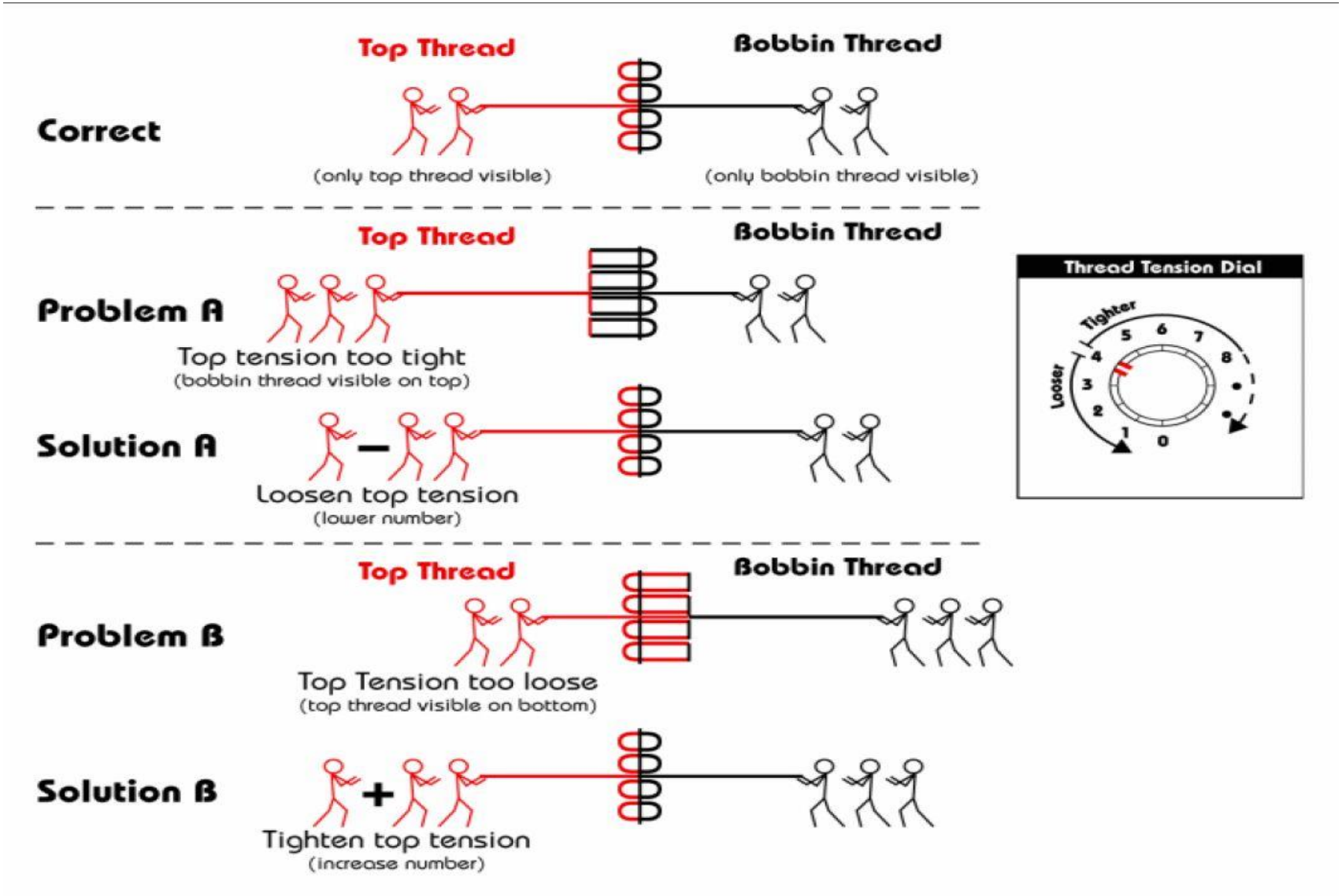
This type of stitch is formed with 4 threads: two needle threads (A) and (A1) ; one looper thread (B); and one cover thread (C). Loops of thread (A) and (A1) are passed through loops of thread (C) already cast on the surface of the material, and then through the material where they shall be interlooped with loops of thread (B) on the underside.



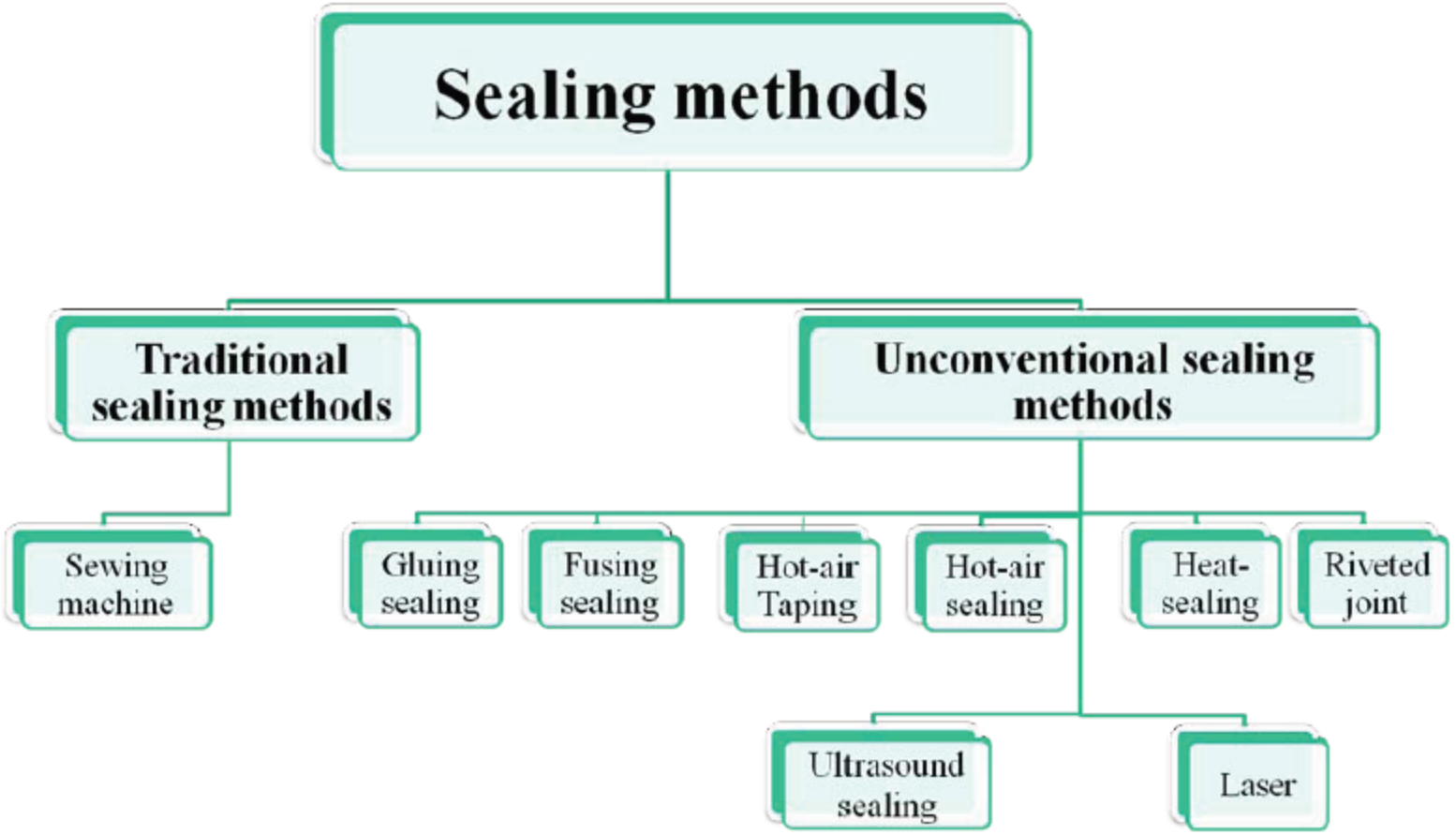


Decorative stitch for lace attaching to underwear, swim-suits, etc

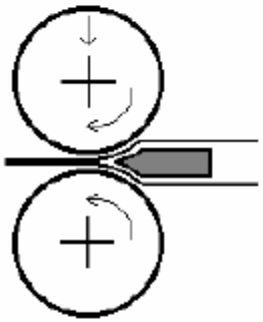
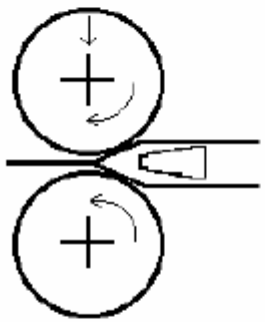
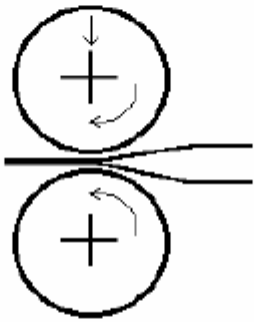
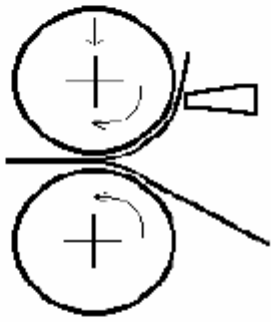
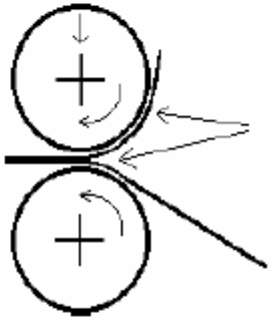
Stitch Fault



Unconventional sealing


Sealing methods
Traditional sealing methods
Unconventional sealing methods
Sewing machine
Gluing sealing
Fusing sealing
Hot-air Taping
Hot-air sealing
Heat-sealing
Riveted joint
Ultrasound sealing
Laser

Welding methods

Heat sealing	Hot-air sealing	Ultrasonic	Hot-air Taping	Laser
				
Welding Parameters: Roller Pressure, Speed, Temperature	Welding Parameters: Roller Pressure, Speed, Temperature, Hot Air Flow	Welding Parameters: Roller Pressure, Speed, Ultrasonic Energy	Welding Parameters: Roller Pressure, Speed, Temperature, Hot Air Flow	Welding Parameters: Roller Pressure, Speed, Laser Energy

Types of Production Systems

1. **Make Through System**
2. **Piece Rate Production System**
3. **Overhead Production System (UPS -Unit Production system)**
4. **Modular Production System**
5. **Progressive Bundle System**

Make through System

- When a tailor alone makes a complete garment, then it is called as make though systems. The tailor even makes pattern (use ready-made pattern), cuts fabric and does finishing of the garment. For example, tailors in the tailor shops do all jobs from cut to pack. In this system tailors are not depended to others.

Piece rate production system

- **Concept And Meaning Of Piece Rate System Of Wage Payment**
  The piece rate system is that system of wage payment in which the workers are paid on the basis of the units of output produced.
- Total Wages Earned= Output x Piece Rate

Overhead Production System (UPS - Unit Production system)

- A Unit Production System is a type of layout that uses an overhead transporter system to move garment components from work station to work station for assembly.
- In UPS, there are hangers. One hanger have multiple clips containing all parts of the single garment.
- All parts for the single garment are advanced through stitching line together by means of hanging carrier that moves along an overhead conveyor.
- Hanging carrier can be moved **manually** by the operator using button after completion of single operation or By **computerized system** that move the conveyor after a specific fed throughput time.

Modular Production System

- A Modular Production System is a contained, manageable work unit that includes an empowered work team, equipment and work to be executed.
- The number of teams in a plant varies with the size and needs of the firm and product line.
- Usually there are 4-15 labors in one team depending upon the type of garment to be stitched and skills of labor.
- Teams may be used to perform all the operations (whole garment production) or certain portion of assembly operations.
- Team is responsible for maintaining a smooth work flow, meeting production goals, quality level.

Progressive Bundle System (PBS)

- Also Called Material Handling System.
- As name implies the bundle of garment parts move from operation to operation.
- Traditional Production system.
- Widely used by apparel manufacturers for several decades and still today.
- 80% apparel manufacturers use the Bundle system (PBS).

➢ Bundles are assembled in the cutting room, where cut parts are matched up with corresponding parts and bundle tickets.

➢ Workers (labour) transport and move Bundles of cut parts to sewing room via trollies.

➢ Operator scheduled to complete the operation and perform same operation on all pieces in the bundle, retie the bundle, remove Bundle ticket and move bundle for next operation.

Types of garment production systems

I. Progressive Bundle System

II.Unit Production System

III.Modular garment production

Thank you

References

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