

Topics

∞ Padding Mangles

∞ Stentering machine

MANGLES

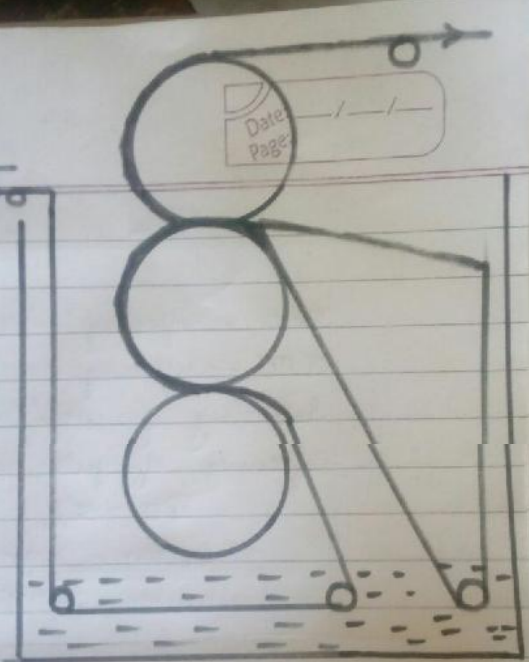


- A machine having two or more rollers turned by a handle, between which wet laundry is squeezed to remove excess moisture.
- Most piece goods made of cotton or linen are bleached in rope form, and after the sequence of operations which made up the bleaching process, the cloth is opened to full width by the scutcher.
- At this stage, many types of cloth are dried before passing to the next process, and in some cases the cloth is passed through a mangle to remove excessive moisture before drying.

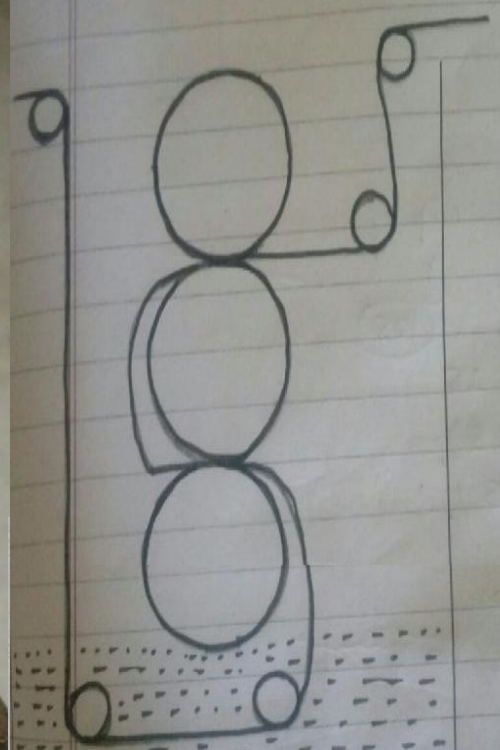
GENERAL TERMS

- ⌘ 1) **Nip-It is the pressure applied by the rollers to squeeze the excess liquor from the cloth.**
- ⌘ 2) **Dip-The number of times fabric passes through the containing the liquor (which can be dye or finish used).**
- ⌘ 3) **Expression/dye pick up/add on/efficiency-amount of liquor absorbed by the fabric.**
- ⌘ 4) **Add on depends upon following-**
 - **Pressure of nip**
 - **No. of dips**
 - **No. of nips**
 - **Concentration of liquor**
- ⌘ 5) **How to increase shade?**
- ⌘ 6) **How to decrease the shade?**

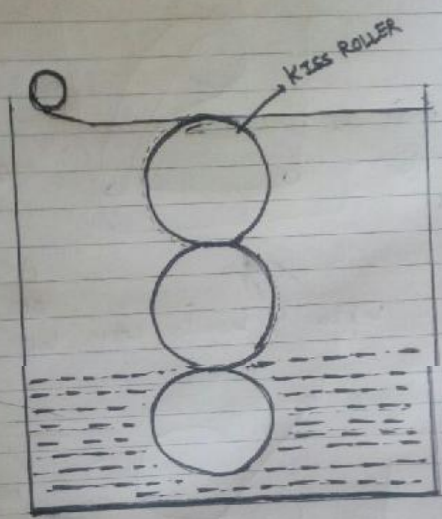
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2 nips 2 dips
TO PRODUCE DARKER SHADES



1 dip 2 nips
TO PRODUCE LIGHTER SHADES



TO PRODUCE LIGHTER SHADES

TYPES OF MANGLES

There are five types of mangles-

- Ordinary padding mangle
- Friction padding mangle
- Back filling mangle
- Back skimming mangle
- Water mangle

ORDINARY MANGLE

- Two bowl padding mangle
- Three bowl padding mangle
- Fibe mangle
- Houbold mangle

TWO BOWL PADDING MANGLE

A simple padding mangle consisting of two squeezing bowls(rolls).The upper one of iron and covered with rubber and the lower one of brass, arranged over a shallow trough provided with two or more freely rotating guide rollers.

LIMITATIONS OF TWO BOWL PADDING MANGLE-

- 1) Limited dip
- 2) Limited metering
- 3) Limited nip
- 4) Unevenness

DIAGRAM OF TWO BOWL PADDING MANGLE

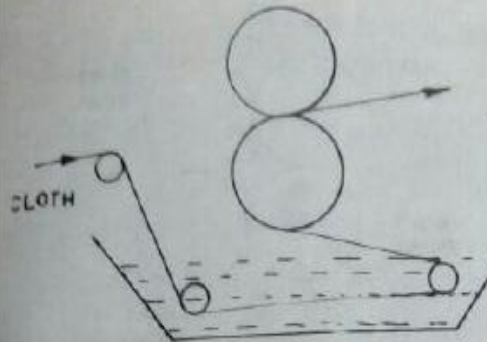
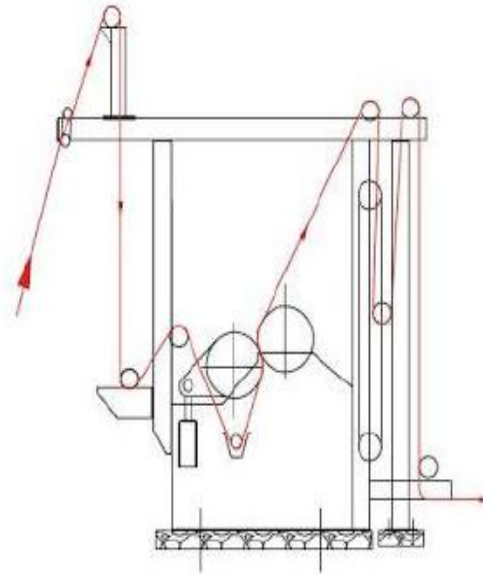
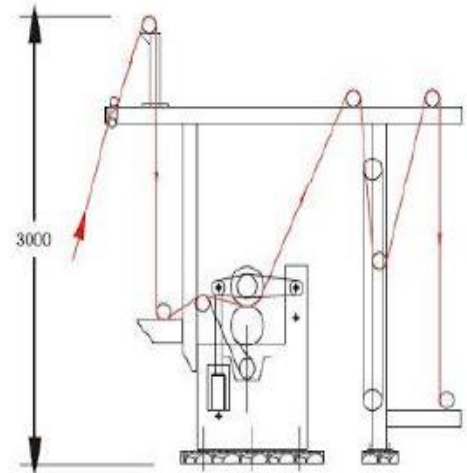


Fig. 18.3 : Two-bowl padding mangle

TWO BOWL INCLINED PADDING MANGLE



VERTICAL TWO BOWL PADDING MANGLE



THREE BOWL PADDING MANGLE

- In three bowl mangle two iron bowls are positively driven and the rubber bowl floats between them and is driven by frictional contact thus prolonging its life.
- Jacketed troughs are available to maintain the impregnating solution at the required temperature and inside the trough may be placed a special suction pipe with a slot to draw the liquor through the fabric passing over it and so ensures a thorough impregnation.



- First fig shows three bowl with 2 dips and 2 nips
- Second fig shows three bowl with 1 dip and 2 nips

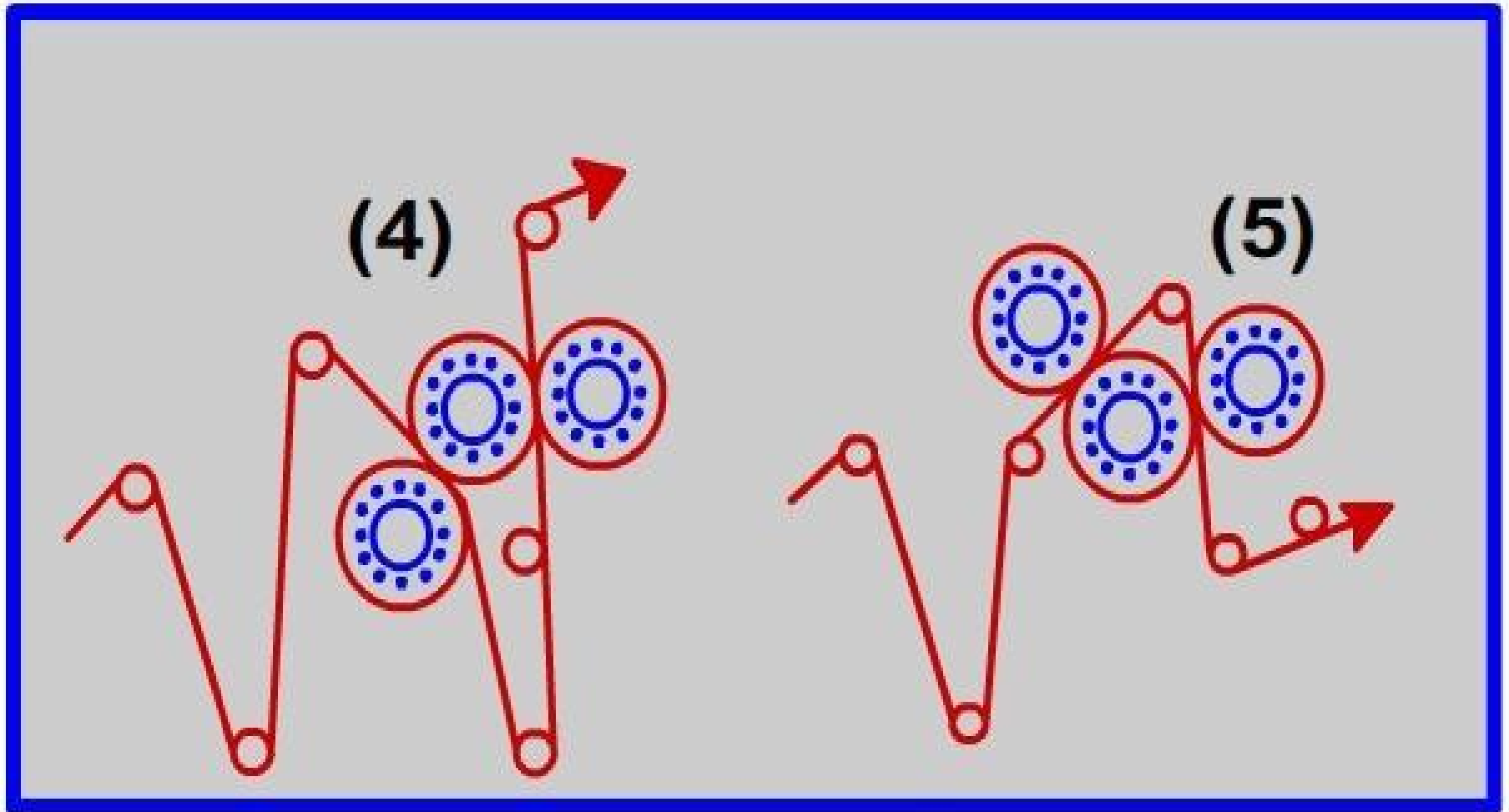


DIAGRAM OF THREE BOWL PADDING MANGLE

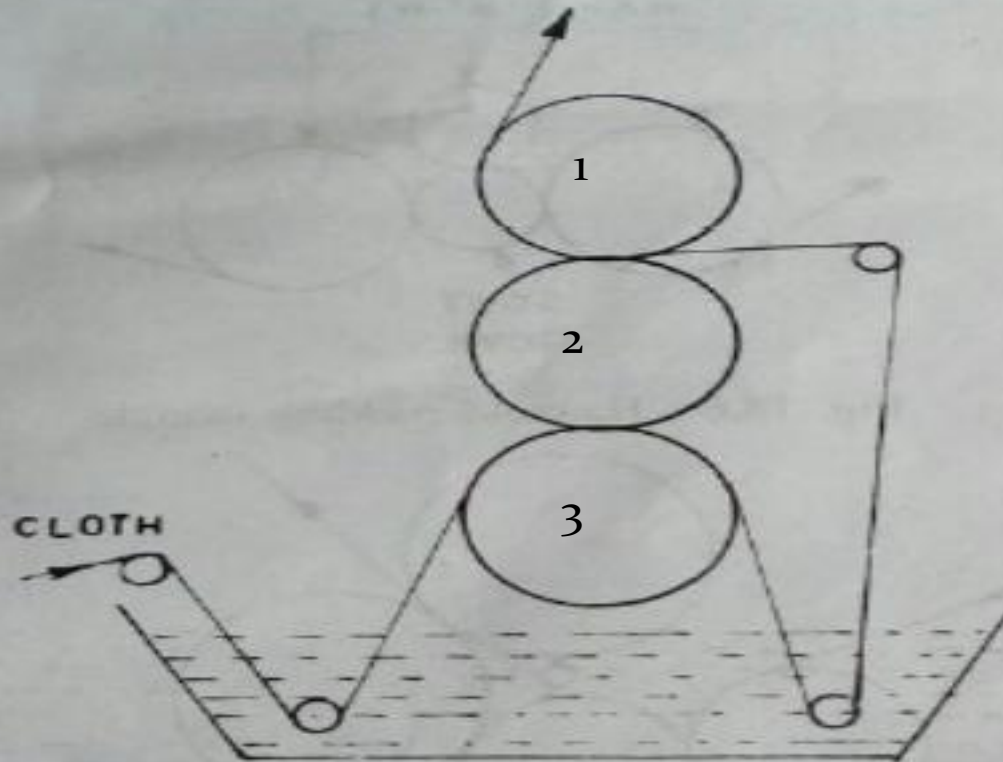


Fig. 18.4 : Three-bowl padding mangle

FIBE MANGLE

- The fibe mangle consists of 4 bowl (2 soft and 2 hard) arranged in two Pairs.
- in such a way that each bowl makes contact with two others.
- The liquor is encased by the 4 bowls to form a trough and is prevented from escaping by two rubber covered nickel plates at the end.
- A perforated pipe is introduced in the liquor space to feed the pad liquor at the rate at which the cloth takes it up.

- The liquor is fed from a storage tank by means of a centrifugal pump at the required temperature.
- The maximum capacity of the trough is 5 litres.
- The cloth enters through the nip of the two bowls which are under **very heavy pressure** so that the air in it is driven out.
- The de-aerated cloth then passes through the liquor, absorbs it quickly, passes around a guide roller inside the trough and then comes out from the two vertical rollers.
- It is then taken around another guide roller, re-enters the trough through the nip of the two lower bowls, passes along another guide roller and comes out of the machine in a horizontal direction.
- In the machine, cloth is squeezed 4 times.

DIAGRAM OF FIBRE MANGLE

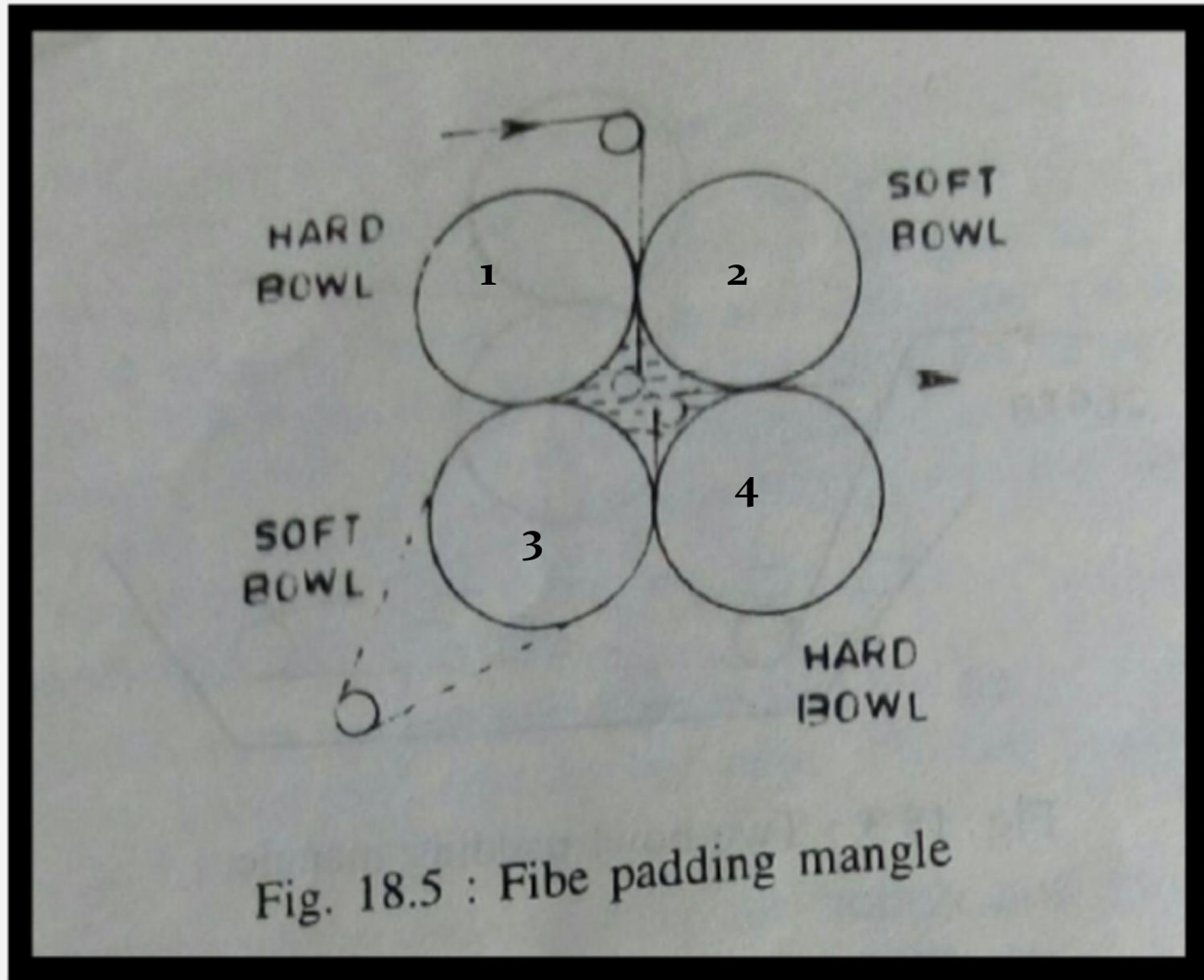
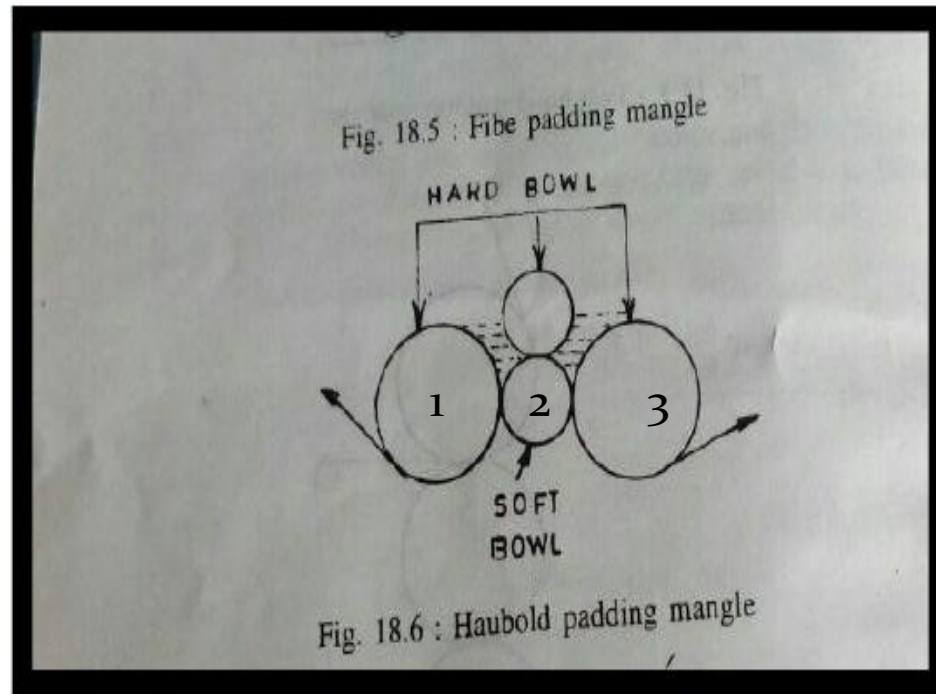


Fig. 18.5 : Fibre padding mangle

Haubold Mangle-

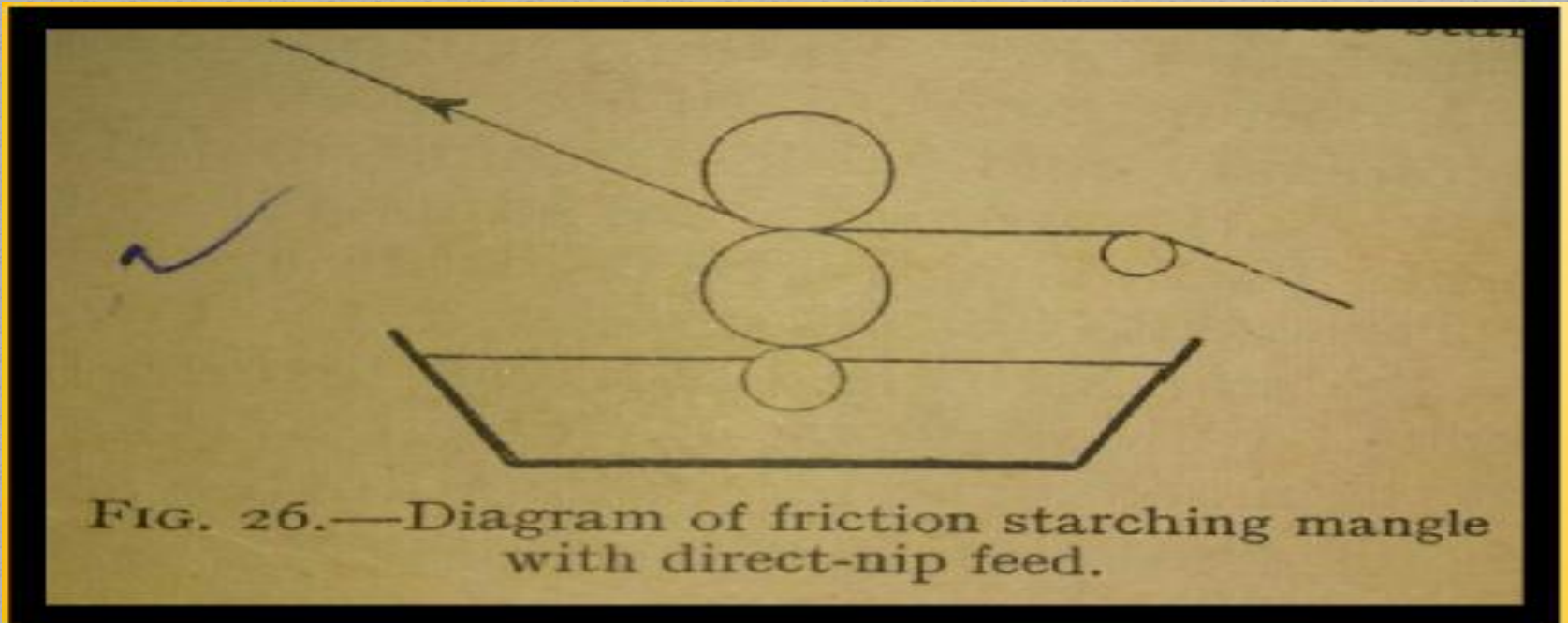
- This mangle also consists of four bowls, three of which are hard, brass bowl, and one is soft, rubber covered.
- The 3 bowls are arranged in a horizontal plane touching each other while the fourth bowl is placed over the central bowl to form two troughs through which the cloth is passed.
- The escape of the liquor is prevented by 2 end plates. The cloth is partially deaerated as it enters the first nip and receives 3 squeezings.

DIAGRAM OF HOUBOOLD MANGLE



Friction Mangle

- The friction mangle has gear drive for both top and bottom bowls and it rubs the finishing preparation into the fabric and gives heavier effect than is possible from the ordinary mangle.



WATER MANGLES

- **The cloth is passed through a water mangle to remove excessive moisture before drying.**
- **Water mangles are commonly made from three to six bowls but even eight bowl mangles can be used; closed or open framing may house the mangle assembly.**
- **The mangles are usually equipped with tension rails and an expanded at the entering site.**
- **Bowls may be made of cotton, rubber or jute fibre and brass with a three bowl mangle the metal bowl is almost always the central bowl.**
- **Better results may be obtained from the five or six bowl mangle and here it is possible to effect partial drying by heating the metal bowls.**

WORKING OF WATER MANGLE

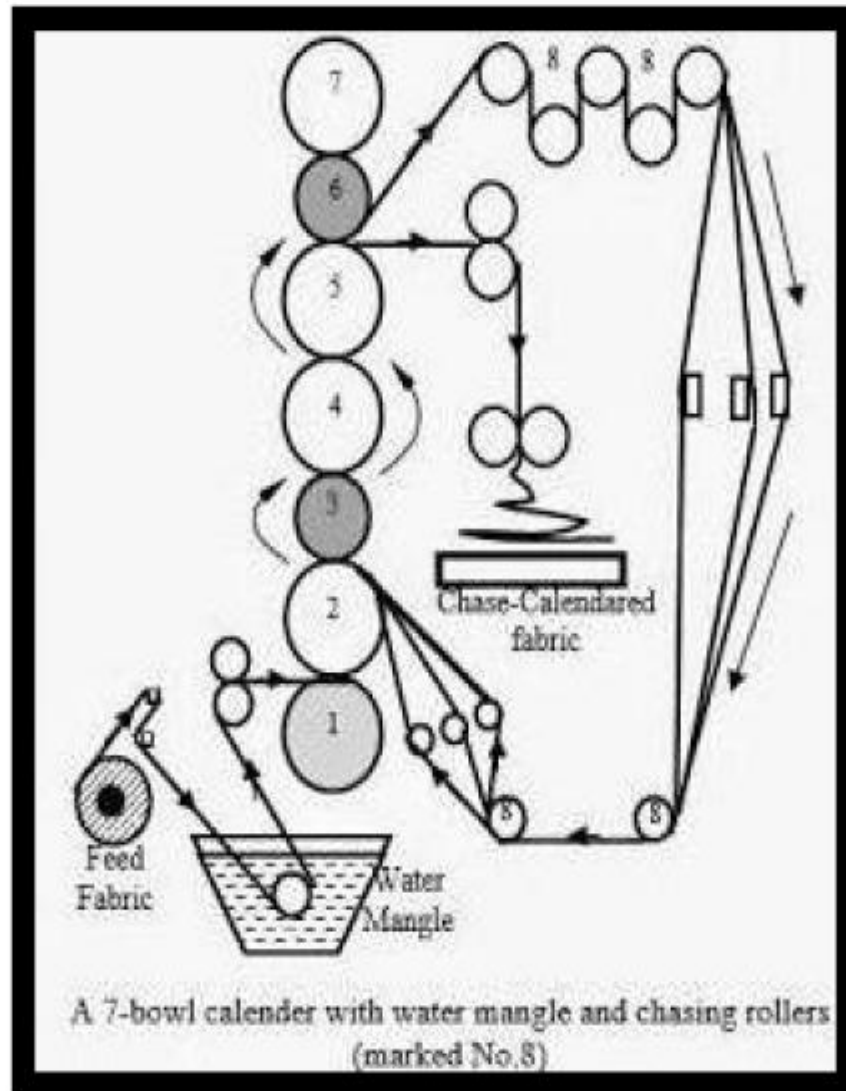
The cloth passes from the entering batch over the usual tension or stave rails into the water box and then over the expander to the lowest nip of the mangle.

After passing through the various nips the cloth runs over drying cylinder where it is partly dried and then passes under the bottom chasing(D) over the scrimp rails and into the second nip of the mangle.

Two or three layer of cloth may be passed through the mangle after which the material may be batched or plated ready for drying.

Fig. shows general system of chasing on the water mangle of which when followed by drying may be the whole finishing operation for certain classes of fabric

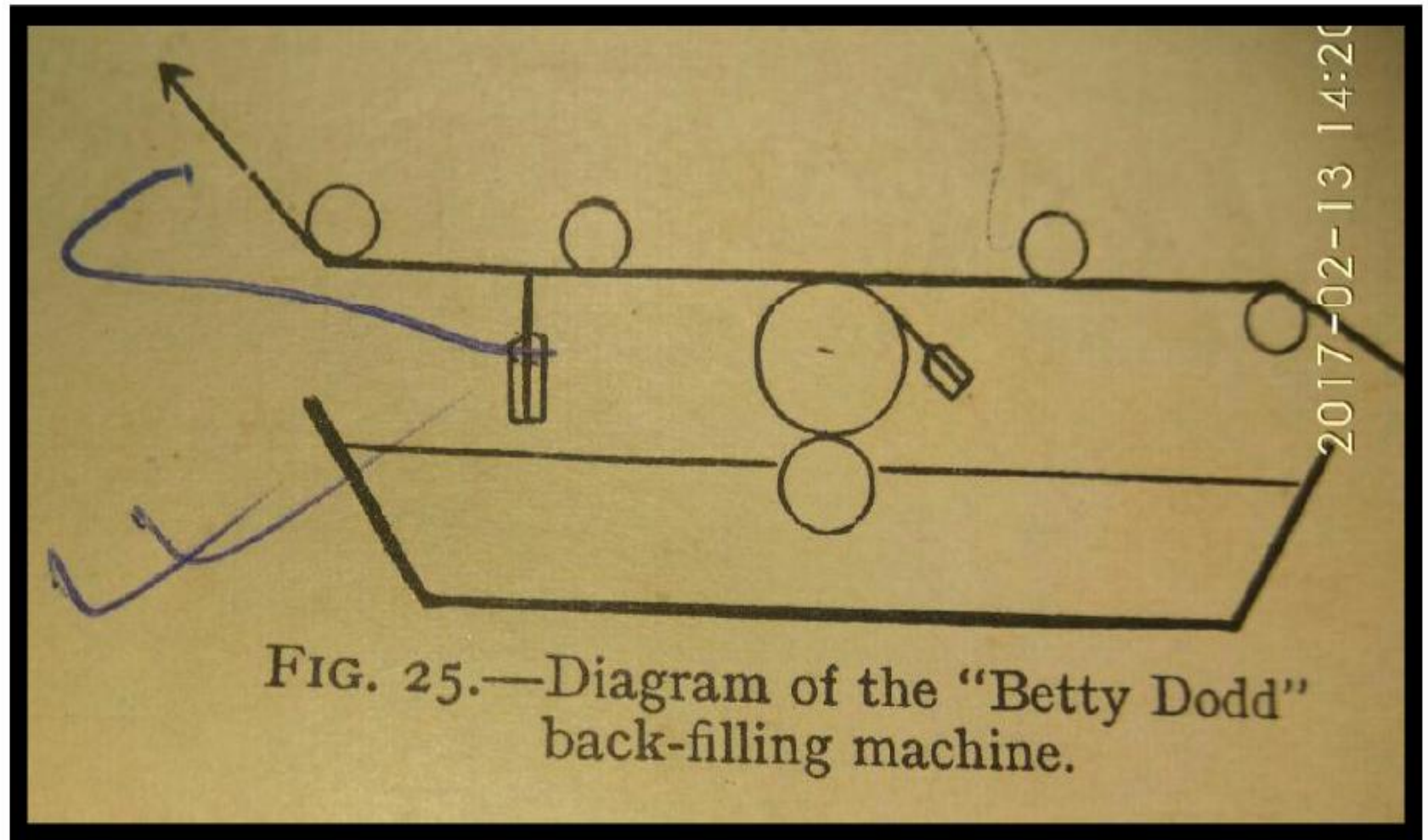
DIAGRAM OF WATER MANGLE



BACK FILLING MANGLE

- The cloth is passed round the large wooden or brass bowl which is partially immersed in the trough containing the mixing which is pressed into the fabric by a doctor blade which also removes the surplus.
- A second doctor blade at the back of the mangle keeps the bowl clean so that the face of the cloth is not affected.

DIAGRAM OF BACK-FILLING MACHINE

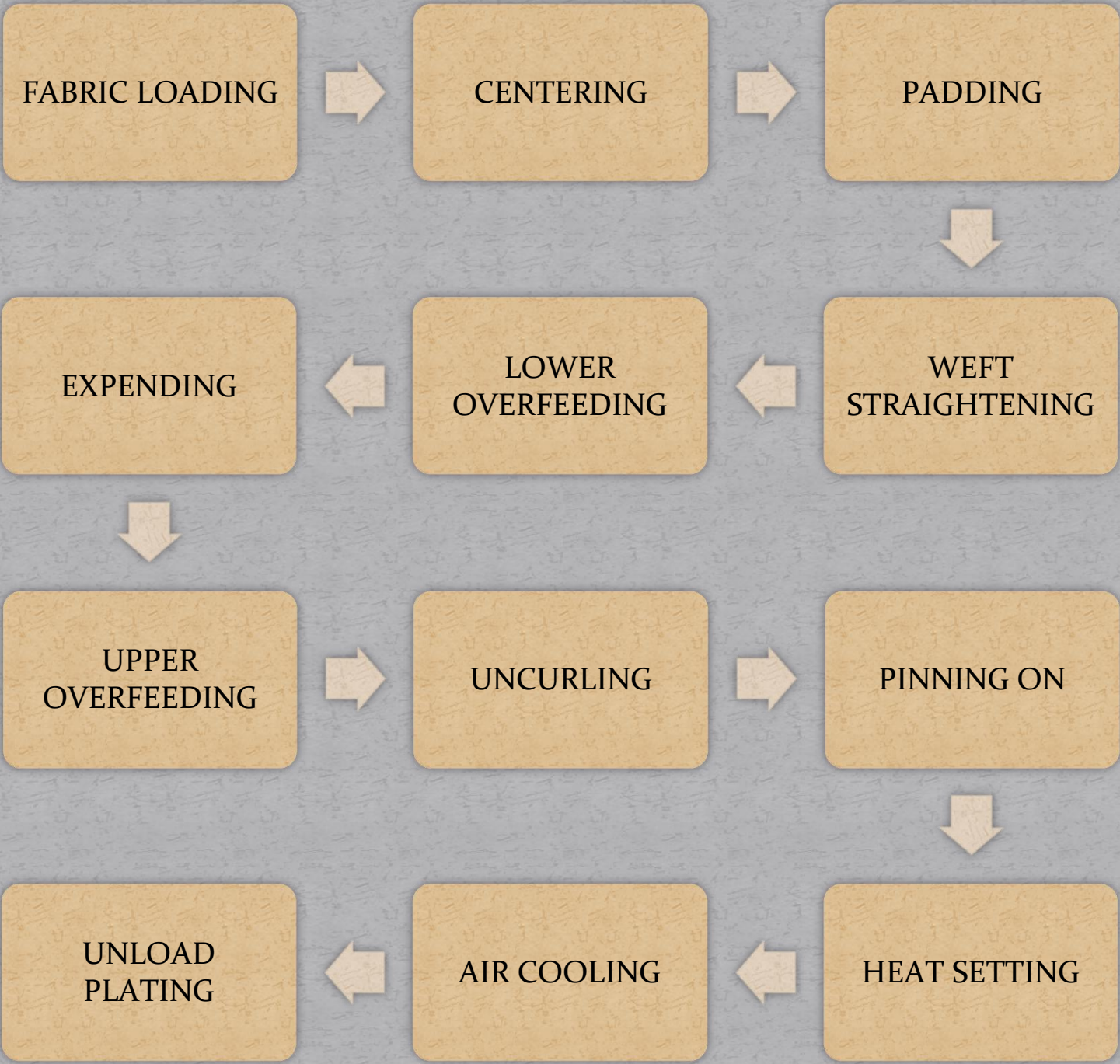


Application of Mangles for Starch Finishes

- Back filling mangle with only one roller or bowl.
- Skimming or back starching mangles with one bowl.
- Simple two bowl mangle for ordinary impregnation.
- The friction mangle where the upper bowl runs at a higher speed.

STENTERING PROCESS

- ∞ Stenter is the major part of Finishing Department. It is used to for drying, heat setting and imparting Dimensional stability to the fabric in the final stage of processing.
- ∞ It is also a mechanical finishing process of textile
- ∞ It is done for stretching of fabric by **STENTER MACHINE**
- ∞ Basically stentering is done for gripping the edges of a moving web to support the web during heating and stretching operations

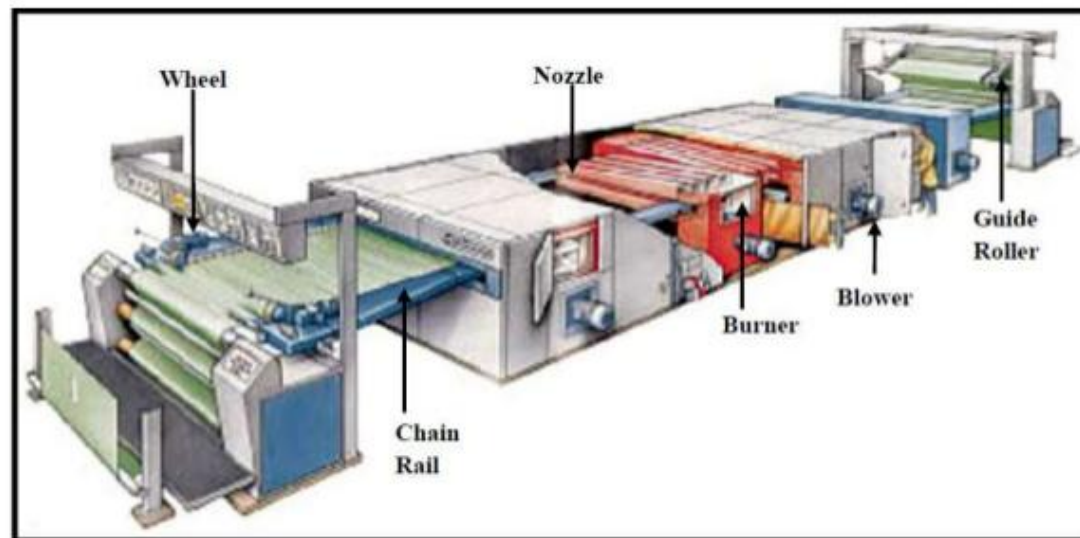




Fabric stentering

STENTER MACHINE

- ❧ It consists of a pair of travelling chains which hold the selvages of cloth, carrying it through the machine under complete width control.
- ❧ A stenter is a machine for drying cloth, in which sheets for drying are held by the edges



- ✧ Various forms of stenter chains are available i.e. pin, spring dip, automatic dip.
- ✧ Straight single layer stenter, known as scotch stenter is most commonly used.
- ✧ Hot air or hot flue gases are used as drying medium.
- ✧ The hot air is turned into superheated steam, produced from water vapour evaporated from fabric to be dried.

FUNCTIONS

- ✧ Heat setting (Lycra synthetic and blended fabrics)
- ✧ Controlling of fabric width
- ✧ Application of finishing chemical on fabric
- ✧ Controlling of shrinkage property of fabric
- ✧ Moisture is also controlled
- ✧ It adjusts the shade variation
- ✧ GSM of the fabric is also controlled

DETAILS OF STENTER MACHINE

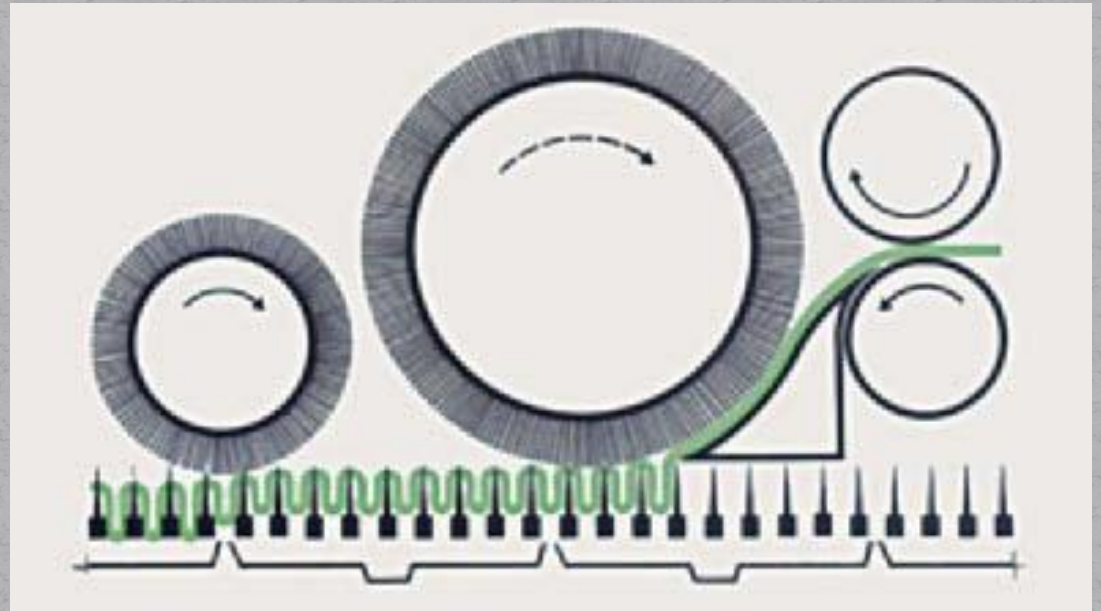
- ❧ **Inlet J-scray:** This part is used to store the fabric during the batch change and Inlet unit contains various parts like tension device, draw roll, pressure roll and break roll. The important functions of the above rollers are to feed the fabric evenly throughout the machine.
- ❧ **Padding mangle:** It contains chemical trough, guide rollers and squeezing mangle. Fabric is dipped into the finish chemical then sent to squeezing mangle. During this time finish chemicals are applied on the fabric and squeezes out extra chemicals from the fabric.

- ❧ **Mahlo device (weft straightener):** It has two bow and three skew rollers which correct the skewness and bowing and make the weft yarns straight.
- ❧ **Over feed system:** To give over feed or under feed of the fabric to respective chain track.
- ❧ **Inlet chain track:** To aid proper pinning or clipping of the fabric.



Inlet chain track

Over feeding system

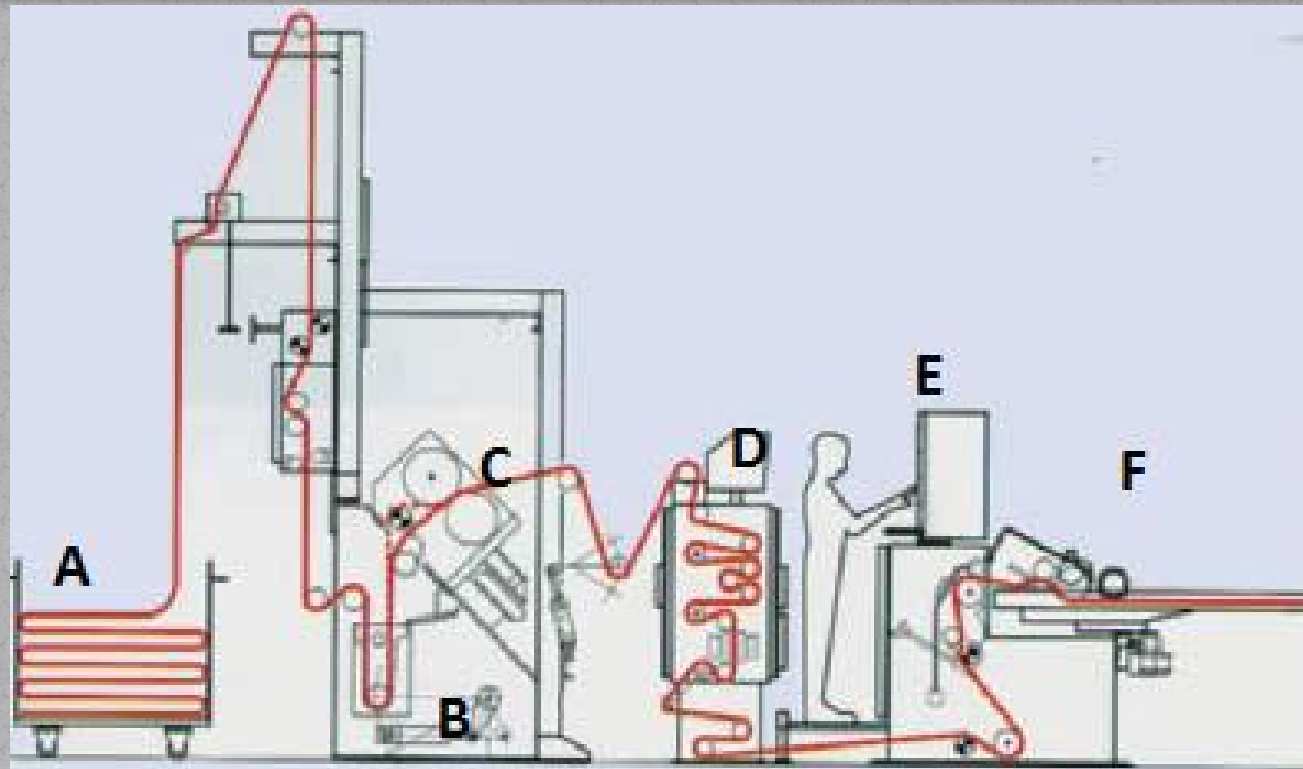


∞ **Drying chambers:**

To dry the fabric or to fix the finishing chemicals by hot air from the blowers. The blower sucks hot air from radiator and blow it into the nozzles through which drying occurs. Inside the drying chamber also contains width adjustment spindle and pin/clip chain track.

There are 8-10 drying chambers in stenter machine, each having 3 meter in length.

Inlet feeding unit



A- Inlet feeding trolley, B- padding trough, c-squeezing mangle, D- Mahlo unit, E-operating panel, F- In feed chain track.

TECHNICAL DETAILS

- ✧ M/c speed – 11m/min
- ✧ Opener – open the fabric but all the fabric does not open in opener
- ✧ Mangle Roller – press the fabric pressure – max 4 kg
- ✧ Predryer - Temp 140°C only dry the fabric
- ✧ Anglada Chamber – Temp 140°C to dry the fabric and
- ✧ tumbling Stenter – To control the width max 2cm + (or) –



Before Stenter



After Stenter



Before Stenter



After Stenter



Before Stenter



After Stenter