Carding

Q. Define Carding/Heart of spinning. Noakhali Textile-`09.

Ans:

Carding may defined as the reduction of an entangled mass of fibres to a filmy web by working between two closely spaced, relatively moving surface clothed with sharp wire points.

The carding is the heart of the spinning mill & well carded is half-spun-demonstrate the immense significance of carding for the final result of the spinning operation. The importance of carding is still greater where new spinning systems are concerned.

Q. Mention the objects of carding (in brief). Dhaka Textile-`03.

Ans:

Opening to individual fibres: The blow room only opens the raw mtl to flocks where as the card opens it to the stage of individual fibres. This enables the elimination of impurities & good performance of the other operation.

Elimination of impurities & dust: Elimination of foreign mtl occurs mainly in the region of the taker in (T-in). In addition to free dust, which can be directly sucked away as in the B/R, the card also removes a large proportion of the micro particles. The card is a good dust removing m/c.

Removing of neps: The card reduces the no. of neps from the B/R. Actually neps are not eliminated at the card, they are mostly opened out. An improvement in disentangling of neps is obtained by: closer spacing between the clothing, sharper clothing; optimal speeds of the T-in; low doffer speeds lower through put.

Elimination of short fibres: Short fibres can only be eliminated if they are passed into the clothing. Elimination of short fibres in the card must be viewed in proportion, actually very small, fewer than 1% short fibres.

Fibre blending: The card is the only m/c to process individual fibres. In formation of the web & with repeated rotation of the fibres on the main cylinder, intimate fibre with fibre mixing is achieved.

Fibre orientation: It is often attribute the effect of parallelizing. The card can be given the task of creating partial longitudinal orientation of the fibres.

Sliver formation: To deposit the fibre mtl, to transport it & process it further, an appropriate product must be formed.

So, carding is called heart of spinning.

Q. Describe different action occurred in card m,/c.
Or, Write the principle of carding.

Q. Describe carding action & stripping action. Dhaka Textile-`02.

Ans:

1. Carding action: If two closed surfaces have opposite wire direction & their speed direction or relative motion is also opposite, then the action between two surfaces is known as carding action.

• It is occurred between flat & cylinder.

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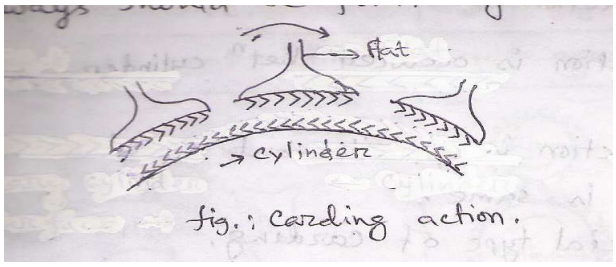
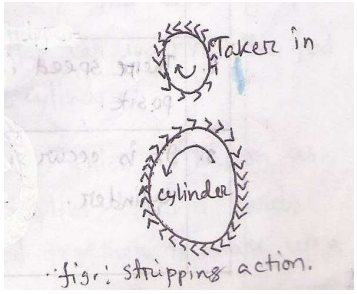
• Here wire direction is opposite.
• Speed direction is opposite.
• If the two surfaces move in the same directions at different speed.



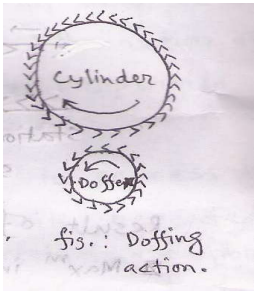
• There always should be point against point direction result of carding action.
Result of carding action -
• Max^{m} individualization of fibres is achieved in this region by opposite spikes.
• Neps, short fibres, dirt & dust are removed.
• The difference of surface speed between cylinder & flat is more.
So, carding action is max^{m} occurred.

2. <u>Stripping action:</u> When two close surfaces have same wire direction & their speed direction or relative motion is also same then the action between two surfaces is called stripping action.



• It is occurred between T-in & cylinder.
• Same wire direction.
• Same speed direction.
• There always should be against back action.
Result of stripping action-
• Trash, neps are transferred from cylinder to Taker in & doffer to stripper by stripping action.

3. <u>Doffing action:</u> When two close surfaces wire points are inclined in opposite direction & their speed direction is same, then the action between two surfaces is called doffing action.
Doffing action is occurred bet^{n} cylinder & doffer.
Wire direction is opposite but speed direction is same.
It is special type of carding.
Sliver formation – is done by this action.

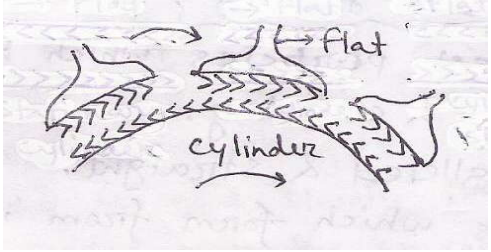


4.<u>Combing action:</u>
This action take place bet^{n} feed roller & T-in.
Here, pin direction is same.

Q. Distinguish between carding action & stripping action with diagram.
Dhaka Textile-`04,`07.

Ans:

Sl. no.	**Carding action**	**Stripping action**
1.	Two surfaces wire points are inclined	Two surfaces wire points are inclined in

	in opposite direction.	same direction.
2.	Their speed direction is opposite.	Their speed direction is same.
3.	It is occurred between flat & cylinder.	It is occurred between T-in & cylinder.
4.	As in this, action, two surfaces are in opposite direction, so min^{m} amount of fibre stay in lower speedy surface.	As in this, action, two surfaces are in same direction, so max^{m} amount of fibre stay in lower speedy surface.
5.	Fibres are mainly individualize3d by this action.	Fibres are mainly individualized by this action.
6.	Points against point action.	Points against point action.
7.		

Q. Describe various types of carding m/c.

Q. Describe fixed flats. Noakhali Textile-`08.

Ans:

According to construction & working principle, carding m/c may be classified into three types –

a. Roller &cleaner card.

b. Flat card

c. Union card.

Flat card m/c are classified into two types –

1. **<u>Stationary flat card:</u>** In the stationary flat carding m/c, the flat does not rotate & the flat covers one fourth of the cylinder. That is why it was named stationary flat carding m/c.
2. **<u>Revolving flat card:</u>** In the revolving flat carding m/c the flat revolves or rotates along with the cylinder.
   Another type of carding m/c is available which is known as Duo or tandem cards. As the name implies, tandem cards consists of two individual cards joined together to make up a unit, in which the doffer of the first card feeds fibres mtl to the taker-in of the second card.

According to their delivery speed (Doffer r.p.m.) carding m/c are classified into three types –

a. Conventional card (4-6).
b. Semi-high speed card (15-25).
c. High-speed card (30+).

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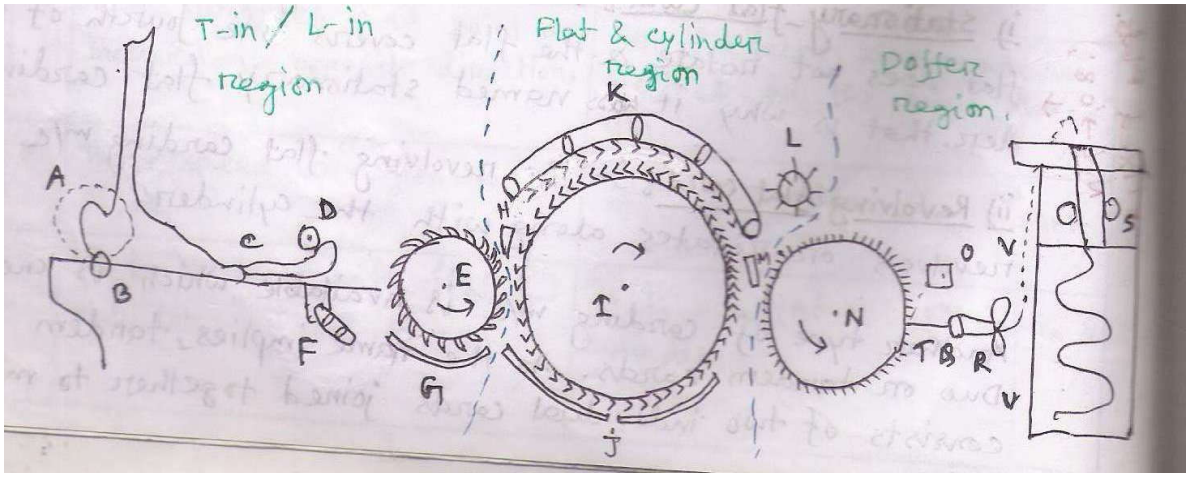
Q. Mention the objects of carding.	Dhaka Textile-`04.
Why carding is called the heart of spinning?	Dhaka Textile-`07.

Ans:

1. To remove the small trash particles which have not been taken out in the opening & cleaning.
2. To make the fibre paralleled & straight.
3. To remove neps & motes which form from immature fibres.
4. To give some degree of blending.
5. To give partial longitudinal orientation of the fibres.
6. To remove the short staple fibres.
7. Elimination of the remaining impurities.
8. To produce a thick untwisted rope of fibres called sliver which is suitable for subsequent processing, which is more or less uniform in wt/unit length.
9.

Q. Describe the working principle of revolving flat card m/c with neat sketch.

Ans:



M/c parts:

i) T-in or L-in region:
A = Lap,
B = Lap roller
C = Feed plate
D = Feed roller
E = T-in
F = Mote knives
G = Under casing

ii) Flat & Cylinder region:
H = Back plate
I = Cylinder
J = Cyl-undercasing
K = Flat
L = Flat cleaning brush
M = Front plat

iii) Doffer region:
N = Doffer
O = Doffer comb
Q = Template
R = Calendar roller
S = Coiler
T = Web
U = Can
V = Sliver.

Working principle: The various parts of carding m/c are shown in fig. The direction of revolving is indicated by the arrow sign. The lap is placed upon a slowly **revolving lap roller (B)** & The sheet of cotton passes over the smooth surface of the **feed plate(C)** & on bet^{n} the curve portion of this plate & **feed roller(D)**. The slow revolution of this roller brings the cotton into the contact with saw teeth of the quickly revolving **T-in(E)**. There are two mote **knives(F)** under the T-in which remove the dust from the cotton. There are

several metal grid bars under the T-in by which the dust & impurities are gathered in T-in under **casing(G)**. The cotton receives a very effective cleaning at this point & the loosened fibres are carried round to the **cylinder(I)** From T-in. There is flexible or metallic card clothing in the surface of cylinder. The surface speed of cylinder is double to T-in. The flocks themselves are carried along with the main cylinder & carry them forward to the **flats(k)** which surrounding almost one third of the cylinder & covered also with similar teeth. Their movement is extremely slow & in the same direction as the cylinder. Due to cylinder's high speed & flats smooth speed, there is action of point against point that means carding occurred. As a result, fibres become straight & parallel to each other. After the carding operation has been completed, the carded cotton is now transferred from cylinder to **doffer(N)**. After carding the fibres do not forms a transportable intermediate product. Here an additional cylinder (doffer) is req^{d} for this purpose. The doffer combines the fibres into a web because of its substantially lower peripheral speed relative to the main cylinder. Here also doffing action is done. The stripping roller draws the web from the doffer. Then it is passed through the **template(Q)** & **calendar roller(R)**. Here the sliver becomes compressed to some extent, then the **coiler (S)** deposits it in **cans(U)**. Under the cylinder a cylinder undercasing is placed. The working rollers cylinder & flats are provided with clothing which becomes worn during fibre processing & these parts must be reground at regular intervals.

Q. Mention the characteristics of revolving flat card m/c.

Ans:

i) Width of the m/c → 38″,40″ & 45″
ii) Size of the floor:-
For 38″ flat card → 5″ – 4″ × 10″ – 10.5″
For coiler → 7″
For 45″ flat card → 5″ – 11″ × 11″ – 11.75″
For coiler → 54″
iii) The max^{m} height from floor → 6″
iv) The dia of lap roller → 4″ / 6″
v) The dia of feed roller → 2″ / 2.5″
vi) The dia of T-in → 9″or9.5″
vii) The dia of cylinder → 50″
viii) The dia of doffer → 24″or27″

Motion:

i) Cylinder → 250-500 r.p.m.
ii) T-in → 300-600 r.p.m.
iii) Doffer → 5-15 r.p.m.
iv) S.S. of feed roller → 1ft/inch.
v) S.S. of flat → 2″ – 7″ / min

Production:

i) Indian cotton → 16.5lb/hr.
ii) American cotton → 13.5 lb/hr.

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iii) Egyptian cotton (combed) → 7.5 lb/hr
iv) Egyptian cotton (without combed) → 6.5 lb/hr.

Q. Write a short note on 'T-in'

Ans:

Specification:

i) Diameter → 9″ – 9.5″
ii) Speed → 600-600 r.p.m.
iii) Wire point direction → Anticlockwise.
iv) Surface speed → 1000ft/min.

Object:

i) To unwind the lap continuous feed with uncontrolled stretching.
ii) To eliminate the impurities.
iii) To transfer the fibres as evenly as possible.
iv) To perform the primary cleaning & opening of cotton fibre.
v)

Q. Write a short note on 'Cylinder' Dhaka Textile-`06.

Ans:

Specification:

i) Diameter → 50″ (1280mm)
i) Speed → 250-500 r.p.m.
ii) Wire point per square inch → 550-650
iii) Surface speed → 1000ft/min.
iv) Total wire point per cylinder → 30lac.
v) Wire point direction → Anti clock-wise.

Objects:

1.Back plate:

- To hold the fibre.
- To prevent the development of undesirable air current.

2. Top feather edge sheet: It controls the wt. & thickness of the flat strips.

3. Cylinder stripping door: This door is used to strip the wire point of cylinder.

4. Bottom sheet:

- To hold the fibre.
- To prevent the development of undesirable air current.

5. Cylinder undercasing:

- Remove dust.
- To maintain constant airflow.

Q. Write a note on 'Flat'

Q. Write down the object of flat. Dhaka Textile-`06

Ans:

Specification:

i) Width → $1\frac{3}{4}$ inch

ii) No. of flats → 100-120.
iii) Wire point direction → Clockwise.
iv) Surface speed v 2-7 inch/min.

Objects:

1. To open the flocks to individual fibres.
2. Eliminate of remaining impurities.
3. To eliminate some short fibres.
4. To remove dust.
5. To distangle Neps
6. High degree of longitudinal orientation of fibre.

Q. Write a note on 'Doffer'
Q. Write down the objects of doffer. Dhaka Textile-`06.

Ans:

Specification:

i) Diameter → 27″
i) Speed → 30-100 r.p.m.
i) Wire point per square inch → 550-650
ii) Surface speed → $50 \times 27 \times \pi$ inch/min.

Objects:

1. To collect fibre from the cylinder.
2. To strip the fibres from the doffer which is moving slowly by doffer comb in the form of a thin web.
3. To condense them into a continuous rope like known as sliver with the help of calender rollers & trumpet.
4. To deposit them in the form of coils in a can with the help of coiler mechanism.

Q. What is sliver?

Ans:

The web is made to pass through a condensing trumpet & is converted into the form of a rope which is called sliver.

Q. Define card setting. Noakhali Textile-`08.

Ans:

In carding m/c, the distance bet^{n} subsequent p[art is called card setting. Setting of different parts are of very fine gauge, which are expressed in terms of $\frac{1}{1000}''$ i.e. in Thio. Now-a-days it is also done in mm. Each & every parts are placed or installed in the carding m/c with a precised & accurate setting to achieve the sliver regularity.

Q. What is Ideal setting?

Ans:

Ideal setting are those settings which are recommended by the m/c maker.

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Q. What is optimum card setting?

Ans:

Optimum setting are those settings which are merely suitable for achieving the technological target as well as efficiency. It may be quoted that the ideal settings & optimum settings may be of same or different in versatile cases.

Q. Write down the factors which are considered for optimum card setting.

Ans:

1. Type of feed mtl (cotton, synthetic etc).
2. Staple length of the mtl.
3. Fibre fineness.
4. The amount of trash to be removed.
5. The hank of lap feed.
6. The expected waste percentage.
7. Types of card clothing.
8. Hank of delivered sliver.
9. Production rate.
10. Mechanical condition of m/c.

Q. Describe the major setting points of carding with their effect.

Dhaka Textile-`07. Noakhali Textile-`08,`09.

Ans:

1. Lap guide to feed roller:

Settings: $\frac{3}{4}''$ $-1''$

Effects: It controls the selvewdges of web. Higher distance make bad selvedge.

2. Feed roller to T-in:

Settings: 9-12 Thio.

Effect: For higher staple, heavy lap, setting will be wider. Excessive impurities in lap, setting will be closer.

3. Mote knife to T-in:

Setting:

Bottom $\rightarrow$ 12-15 Thio. (closer setting for heavy dusts.)

Top $\rightarrow$ 10 Thio. (wider setting for less impurities.)

Effects: The setting should be sufficiently close to remove heavy impurities on the T-in surface. If the setting is too wide the mote knives operate inefficiently.

4. T-in to Cylinder:

Setting: 7 Thio.

Effect: The object of this setting is to transfer the fibres to the cylinder & enable the T-in to present clean teeth to the lap fringe. An unreasonably wide setting would not ensure removal of the cotton from the R-in & in an extreme case, if the T-in became covered with cotton, its action of taking small tufts of mtl from the lap which would be performed inefficiently & neps would be formed.

5. Black plate to Cylinder:

Setting:
Bottom → 12 Thio.
Top → 10 Thio.
Effect: It influences the air current. Wider setting, high air current, which makes cloudy web.

6. Flat to Cylinder:
Setting: 10 Thio.
Effect: Normal & heavy prod^{n} ensure this setting. For light sliver closer setting, tends to produce cleaner web where an exclusive wide setting result in insufficient removal of neps & a poor appearance in web.
Sometimes 5 points setting occur. For synthetic fibre, setting will be wider.

7. Doffer to Cylinder:
Setting: 5 Thio.
Effect: The object of this setting is to take all god cotton from cylinder to doffer. A wider setting may be many fibres go round the cylinder unnecessarily more times & weakend by the time they are transferred to doffer & a cloudly web will result. These closer setting will damage each other & leading hook may result.

8. T-in to T-in undercasing:
Setting: $\frac{5}{16}''$
Effect: If the setting is too wide, a loss of fibre may occur. Close setting increases the fibre extraction with the waste.

9. Cylinder to Cylinder undercasing:
Setting:
Back → 12 Thio.
Middle → 32 Thio.
Front → 64 Thio.
Effect: These setting influence air currents & production of fly & too wide setting causes loss of good fibre.

All setting are done by leaf gauge.

Q. What is card clothing/card wire clothing/wire clothing? Dhaka Textile-`06.

Ans:
In carding m/c, different parts (i.e. T-in, Cylinder, Doffer & flats) are covered with different types of wire which are known as card clothing. To cover the surface of T-in, Cylinder, doffer & flat of carding m/c with the help of a number of unlimited fine, closely spaced & specially bented wire is called card clothing. The wire points are inserted on the m/c surface by means of a base mtl or foundation. Base mtl may be of textile fabric or may be of some other mtl which is very hard & stiff.

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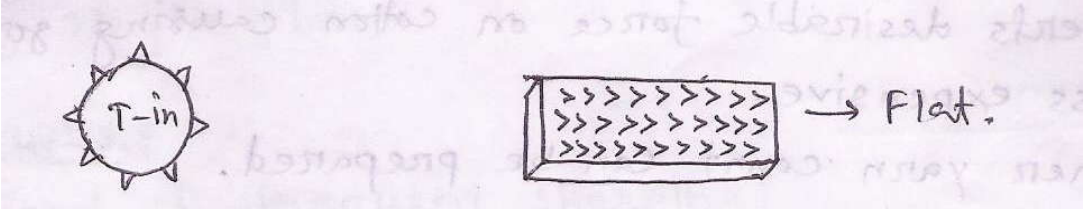


Types of clothing: Card clothing is divided into three group:-

i) Flexible clothing.
ii) Semi-rigid clothing.
iii) Metallic clothing.

Q. Describe the working procedure of flexible card clothing.
Dhaka Textile-`04. Noakhali Textile-`09.

Ans:

These have hooks of round or oval wire set into elastic, multiply cloth backing. Each hook is bent to a U-shape & is formed with a knee that flexes under bending load & returns to its original position when the load is removed. Flexible clothing is used in cylinder, flats & doffer. In short staple spg^{n} mills this clothing is now found only in the stripping roller.

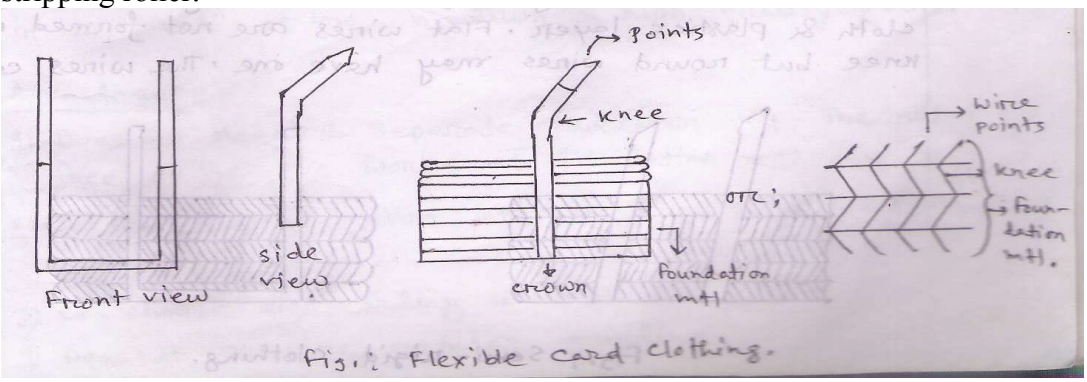


fig.: Flexible card clothing.

Advantages:

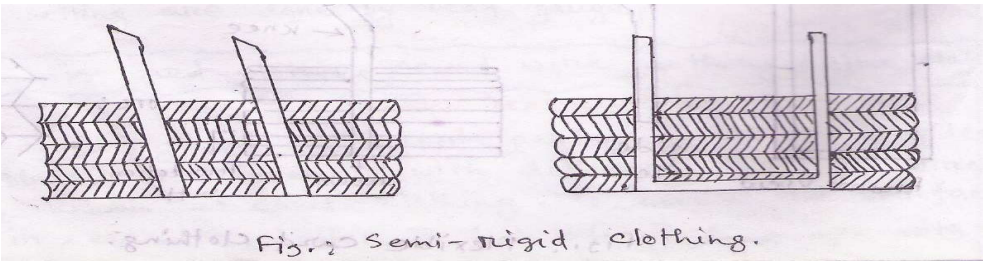
1. Higher point density, so better carding action.
2. Fibre damage is less due to flexible wire point.
3. Only the damaged part of the clothing is needed to be prepared.
4. Exerts desirable force on cotton causing good carding.
5. Less expensive.
6. Finer yarn count can be prepared.

Disadvantages:

1. Requires textile fabric or rubber as foundation mtl.
2. The wires can be loosened.
3. Production less, due to stripping.
4. Neps regular grinding.
5. Wire & foundation mtl may get damage because of they are both flexible.
6. Fibre becomes lose for grinding action.
7. Any carding angle cannot be chosen.

Q. Describe the working procedure of semi-rigid clothing. Dhaka Textile-`04.

Ans:
Here flat or round wires with sharp points are set in backing which are less elastic than those of the flexible clothing. These backing are multiple-ply structures, with more plies than the backing of flexible clothing, comprising both cloth & plastics layer. Flat wires are not formed with a knee but round wires may have one. The wires cannot bend & are so deeply set in layers of cloth & possible foamed mtl that they are practically immovable.



The wire do not need sharpening. When subjected to bending loads, they are therefore much less capable of yielding than flexible clothing. They are also found only in the flats. For wood & long staple fibre.

Advantages:
1. No need of frequent sharping.
2. No need of stripping as well as there is no knee & no dirt & dust is stored.

Q. Describe metallic clothing.	Dhaka Textile-`04.
Q. Advantages of metallic clothing.	Noakhali Textile-`09.
Q. Disadvantages of metallic clothing.	Noakhali Textile-`09.

Ans:
These are continuous, self supporting flat wire structure in which teeth is cut at the smallest spacing by process resembling a punching operation. They do not need any base mtl or foundation. The wire has no knee. Metal surface of m/c acts as metallic foundation. If the teeth are relatively largely used for example as in the T-in. Then the clothing is referred to as saw tooth clothing. Now-a-days the T-in, main Cylinder & doffer are without exception clothed with metallic clothing. The application of metallic card clothing onto spg^{n} carding m/cs has no limits & is used in the prod^{n} of low, medium & high quality yarns.

Advantages:
1. Does not requite separate foundation mtl. The metal surface of the m/c works as foundation mtl.
2. As teeth & foundation mtl are both metallic, there is no possibility of "teeth loose".
3. Can choose any carding angle.
4. Does not require regular grinding.
5. No change of tooth angle due to carding action & so no need of grinding. Again fibre do not embed to teeth & so need of stripping. As a result, save much time.
6. Saved 3% good fibre & increase prod^{n} 18-20% due to no need of stripping & grinding.

Disadvantages:

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1. Carding action is not better due to less point density.
2. Fibre damage is mere as the wire points are metallic.
3. Difficult to repair in the mill when a portion of it is worn out.
4. If any part of the wire is damaged, then the total clothing is rewind.
5. Expensive.
6. Not suitable to prepare finer count.
7. Liberates more fly pollutes air.
8. Requires higher starting torque.

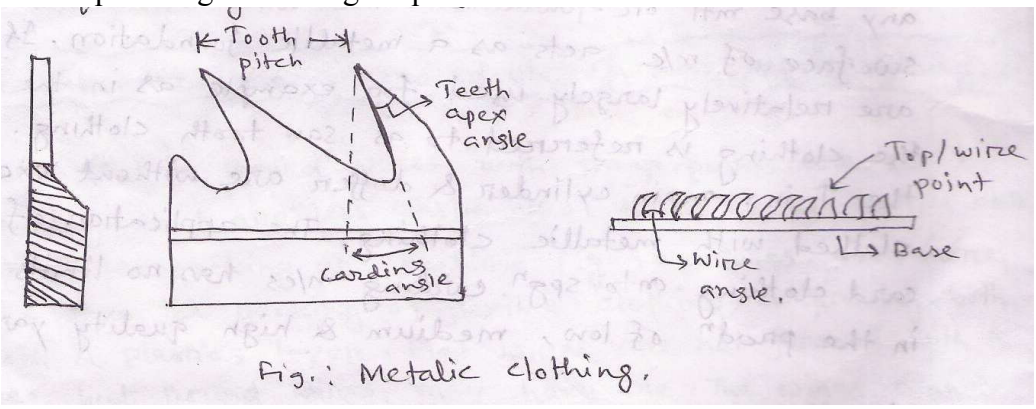


Fig.: Metalic clothing.

Q. Define wire count.

Ans:

The density of wire on foundation is called wire count or amount of wire per unit volume is called wire count.

Q. Distinguish between metallic wire clothing & flexible wire clothing.

Dhaka Textile-`02,`06,`07. Noakhali Textile-`08.

Ans:

Sl. no.	**Metallic clothing**	**Flexible clothing**
1.	The points in the metallic base/rib.	The points are in the extra foundation cloth.
2.	Teeth have no knees	Teeth have knees
3.	No extra foundation mtl is needed. The metal surface of m/c acts as a metallic foundation.	The wires are inserted in separate foundation mtl.
4.	Teeth & foundation are rigid.	Teeth & foundation are flexible.
5.	Angle of tooth are not altered under the strain of carding.	Angle of tooth can be altered due to stress of processing.
6.	Here the fibres can't become embedded behind knees.	Here the fibres become embedded behind knees
7.	Need not req^{d} gradual stripping but occasional.	Req^{d} gradual stripping
8.	No suck situation is arises.	Due to stripping good fibres loss occured (3%)
9.	Req^{d} no regular grinding.	Req^{d} regular grinding.

10.	Moderate carding due to less point density.	Good carding due to higher point density.
11.	The prod^{n} can be increased to 18-20%	Low prod^{n} due to loss of time & lower running speed.
12.	Higher cost of installation due to hegher cost of metallic wire.	Less costly.
13.	Difficult to repair. Complete reclothing necessary. So longibility poor.	Only damaged part can be replaced instead of reclothing completely. So longibility high.
14.	No determination of web quality with time.	Determination of web quality with time.

Q. What is card stripping? Mention its objetcts. Noakhali Textile-`09.

Ans:

Card stripping: During carding operation, fibres & impurities become embedded in the teeth & wires of the several carding organs which reduces "carding power" as well as effectiveness of carding m/c subsequently yarn quality. The process of removing adhering fibres & impurities is known as stripping or card stripping.

When the direction of two moving surface wire are bent to the same direction & they are moving to the opposite direction or in the same direction at different speed, then stripping takes place there. In a word, stripping is the point to point action of the wire.

Objects:

1. To clean all the fillets of the carding organs.
2. For getting higher qualities of sliver, it is necessary to clean the carding organs regularly.
3. For high qualities cotton, it is necessary to clean doffer-cylinder trice in a day.

Q. Describe various types of stripping.

Q. Vaccum stripping. Noakhali Textile-`09.

Ans:

Various types of stripping are described below;

1. Hand stripping: In this stripping system, stripping is done with stripping brush. This method of stripping is absolute now.

2. Roller stripping: It is a conventional method of stripping. A wooden of about 6″ in diameter & equal length to the card width (40″), covered with a special stripping wire fillet is put against the cylinder by opening the front door. The length of wire teeth is about 20 mm where each teeth has a knee bend in it. The stripping is done by passing the point of stripping (roller revolves in the opposite direction of cylinder & doffer) & with higher surface speed for the stripping roller. The wires of stripping roller are comparatively widely spaced & about twice as long as the wires of carding fillet.

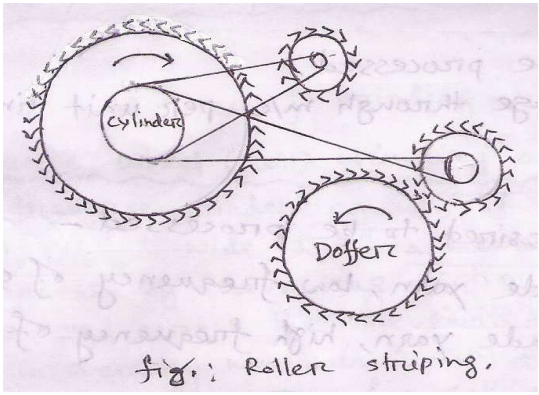


fig.: Roller striping.

3. Continuous roller stripping: It is a nozzle & suction type device. It is automatic continuous stripping device. The nozzle continuously sucking the fibres from beneath the cylinder which have not been transferred to the doffer & put back on the lap for reprocessing. Although this process saves the time for stripping. It is not in use now.

Advantages:

1. Reduction waste & saving in cotton.
2. Reduction in labour cost req^{d} for stripping.
3. More m/c utilisation & more production.
4. More savings in power.
5. More fillet life.

4. Vacuum stripping: No stripping roller is used. This system requires special air pump to maintain a high vacuum & large waste receiving drum or filter room, where the waste is collected. Nozzle is used to collect waste from the surface of the cylinder or doffer etc. Here, stripping can be done while card is still producing sliver. This system is cleaner & better than roller stripping & also popular.

Q. Describe Grinding. its objects — Noakhali Textile-`09.

Ans:

Grinding: Grinding is the operation by which the good working condition of the wire points of all organs in the carding m/c is maintained i.e. the process of sharpening the wire points of different organs of carding. As card operates, the wire points of different organs i.e. T-in, cylinder, doffer, flats loss their effectiveness in regular fibre processing & become poor carding unit. The points become dull & their fibre hooking property is weakened. So, the purpose of card grinding is to maintain the wire points of different organs in sharp condition. If grinding is not done, due to the action of cotton & dirt with the wire points become round at the top & loose their aggressiveness.

Grinding may be considered in two types of wire-

i) Flexible wire, ii) Metallic wire.

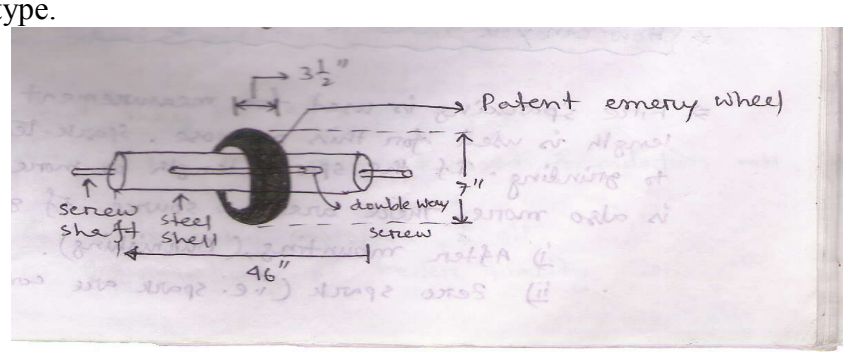
Objects:

1. To increase sharpness of the wire points.
2. To keep equal height of wire.
3. To get regular carding action & uniform sliver.

Q. Describe various types of grinding.	
Q. Long roll grinding or dead roll grinding.	Noakhali Textile-`09.

Ans:

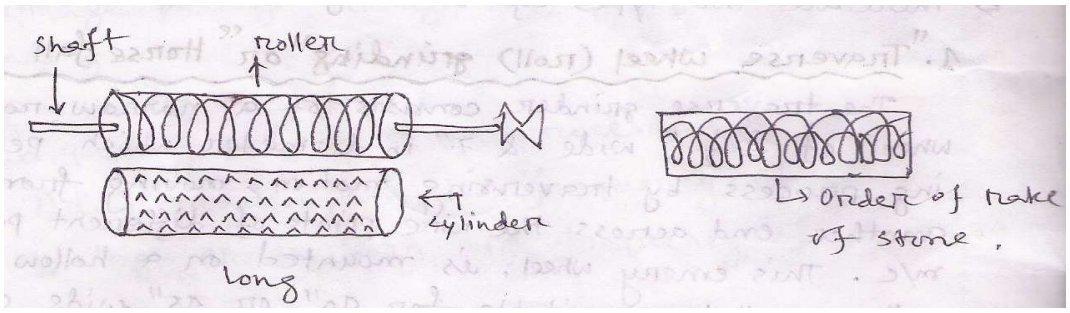
1. <u>"Traverse wheel (roll) grinding" or "Horse fall grinding":</u> The transverse grinding consists of a narrow roll or emery wheel of $3\frac{1}{2}''$ wide $7''$ in diameter which performs grinding process by traversing motion, moving from one end to another end across the wire points of different parts of carding m/c. This emery wheel is mounted on a hollow steel shell of $46''$ or $51''$ long suitable for $40''$ or $45''$ wide cards. Within the hollow shell a long central screw shaft is in, which are cut two wide threads, one right hand & one left hand, which join at the two ends. This types of grinding is more commonly used than the long roller type.



<u>Advantages:</u>

1. Better grinding action.
2. No risk of hooking or fusing of wires.

2. <u>"Long roll grinding" or "dead roll grinding":</u> The long roll grinder is a sheet shell about $7''$ in dia & $42''$or$47''$ long suitable for $40''$or$45''$ wide cards. The roller rotates over the full width of the card & performs grinding process. Roller is covered with emery fillet. The roller is carried on a shaft about $1\frac{1}{8}''$ in dia which projects about $12''$ at each end. A traverse mechanism makes this rotating grinding roller traverse backward & forward. Owing to its traverse, the roller impacts a certain amount 'side' grinding to the wire.



<u>Advantages:</u>

1. Long grinding roller is used in case of high speed grinding.

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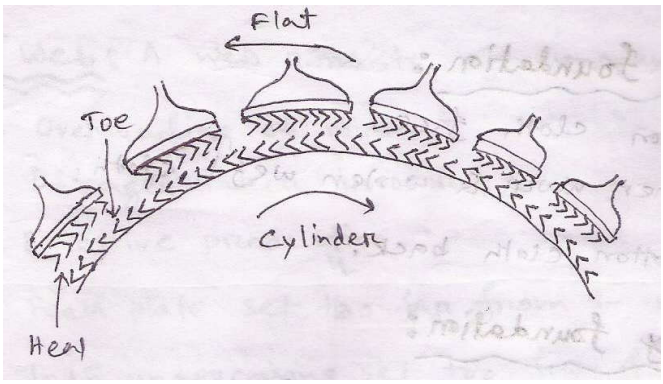
2. It is used produce low & medium count yarn.

Q. Write a short note on "Heal & Toe arrangement." Noakhali Textile-`08,`09.

Ans:

The top half of the cylinder is surrounded by a series of flats. The flats are also covered with wire teeth, the points of which oppose & are set close to the wire on the cylinder. The setting bet^{n} flats & cylinder is arranged that there is a wide3r setting at the back or trailing edge on which cotton first reaches for being carded & closer setting at the leading edge where the cotton leaves the flat. This arrangement is generally termed as 'Heal & Toe' arrangement.



Importance: The object of this type arrangement is to effect a gradual opening & carding of the fibers at each flat.

Q. Write down the name of foundation mtl which are used in flexible card clothing.

Ans:

Foundation mtl may be of two types –

A. Leather: It is the best & most used foundation mtl.

Advantage:

1. It is not attacked by moisture & oil.
2. It is comparatively of better quality.

Disadvantage:

1. It costs more.
2. Elastic property is not good.

B. Piled fabric:

a. 2 ply foundation:

i) Warp → cotton/Linen.
   Weft → woolen.
ii) Cotton cloth back.

b. 3 ply foundation:

i) Cotton cloth face.
ii) Linen warp & woolen weft cloth.
iii) Cotton cloth back.

c. 4 ply foundation:

i) Vulcanized rubber face.

ii) Cotton cloth.
iii) Linen warp & woolen weft cloth.
iv) Cotton cloth back.

d. 5 ply foundation:

i) Vulcanized rubber face.
ii) Cotton cloth face.
iii) Linen warp & woolen weft cloth.
iv) Cotton cloth back.
v) Cotton cloth (single).

Q. Describe the faults in carding.

Ans:

During carding, some faults occur which apparently effects the sliver quality or regularity. The faults are mentioned below –

1. Sliver variation: The main causes of sliver variation –

a) Irregular feed.
b) Uneven feed.
c) Damaged or ecentric feed roller.
d) Bend side shaft.

2. Cloudy web: A web consists of unopened fibres.

Causes:

a) Overloading of wires.
b) Damaged taker-in wires.
c) Excessive production.
d) Feed plate set too far from T-in.
e) T-in undercasing set too far from T-in.
f) Wide setting bet^{n} cylinder & flat.

3. High nep count:

Causes:

a) Incorrect setting (doffer to cylinder, cylinder to flat etc.)
b) Damaged cylinder, doffer, T-in.
c) Dull or damaged flats.
d) Wider setting bet^{n} flat & cylinder or doffer & cylinder or T-in & cylinder..
e) Excessive cylinder loading.
f) Too high a relative humidity –
   a. Proper 45-55% - Temp. 70-80^{0}F – cotton.
   b. Proper 55-56% - Temp. 80-90^{0}F – cotton.

4. Higher cylinder loading:

Causes:

a) Doffer set too far from cylinder.
b) Dirty cylinder wire,
c) Local damage on cylinder wire.
d) Flat setting too close.
e) Double thickness being feed at the selvedge.

5. Broken or malformed selvedges:

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Causes:

a) Card feed too wide.
b) Accumulation of fibre bet^{n} card framing & undercasing.
c) Leakage of oil & grease from bearing.
d) Rough & broken undercasing.
e) Wrong length of undercasing.

6. Excessive blow out:

Causes:

a) Improper setting of undercasing.
b) Broken bars in the casing.
c) Cylinder bends incorrectly set.

7. Disappearing web:

Causes:

a) Undercasing nose too long for the type of mtl being carded.
b) Dull or damaged doffer.

8. Flat strip too heavy:

Causes:

a) Front plate top edge setting to cylinder too wide.
b) Overloaded cylinder.
c) Excessive speed of cylinder.

9. T-in snatch:

Causes:

a) Worn feed roller bearings.
b) Bend side shaft.
c) Feed roller to feed plate setting.

10. Loss in yarn strength:

Causes:

a) Crush roller pressure too high.
b) Excessive T-in speed.
c) Incorrect type of T-in wire.
d) Insufficient flat strip.

Remedies: By rectifying the above causes carding faults can be minimized.

Q. Describe the actions bet^{n} the different parts of carding m/c.

Ans:

In carding m/c, several actions takes place bet^{n} different parts which are described briefly in the following points –

1. Action bet^{n} feed plate, Feed roller & T-in:

a) The feed roller & feed plate grip the fibre tufts during the opening & combing action by the T-in.
b) Here the mtl undergoes combing action & the feed lap broken into smaller tufts.
c) The mtl is drafted to considerable extent.
d) Trash, dusts & heavy neps are removed.

2. Action bet^{n} T-in & cylinder:

a) The mtl get stripping action.
b) The mtl is also drafted here.

c) Individualization of fibres is also achieved here.

3. Action bet^{n} cylinder & flat:

a) The mtl get carding action.
b) Max^{m} individualization of fibres is achieved in the region.
c) Removal of neps, short fibres, dirt & dust

4. Action bet^{n} cylinder & doffer:

a) Transfer of fibres from cylinder to doffer.
b) Condensation of fibres takes place in bet^{n} the doffer & cylinder.
c) The mtls get doffing action.

5. The action bet^{n} doffer & doffer comb: The doffer comb strip the condensed fibres from the surface of the slowly moving doffer in the form of a thin web.

Q. State the chronological development of carding.

Ans:

1748 → Carding m/c was invented by an English named lew is paul which was hand driven.
1754 → Daniel Bowrn obtained a similar patent in the same year this burnt down.
1775 → Richard Arkwright & Samual Cromtion improved the Carding m/c.
1780 → Carding m/c was first set up in the industry.
1789 → A factory was established in Dolobrun to produce carding m/c commercially.

Q. Define the cleaning efficiency of carding.

Ans:

The ratio of trash removed in carding & the trash in lap expressed as percentage, which is called cleaning efficiency of carding. Cleaning efficiency of carding is 70-85%.

$$\text{Cleaning efficiency of carding} = \frac{\text{Trash in lap - Trash in sliver}}{\text{Trash in lap}} \times 100$$

$$= \frac{\text{Trash removed}}{\text{Trash in lap}} \times 100$$

Q. What is Neps Removal Efficiency? Noakhali Textile-`09.

Ans:

The neps per grams that is removed from the carding m/c is expressed as percentage with respect to the nep/gms in cotton while passing through the chute to the carding m/c is known as the nep removal efficiency.

$$\text{N.R.E.} = \frac{\text{neps/gm of feed mtl - neps/gm of delivered mtl}}{\text{neps/gms of feed mtl}} \times 100$$

Q. Write the change points in carding & their effect in changing.
or, What happen, when
i) DCP is changed, ii) 'PCW' or 'Barrow wheel' is changed.

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Dhaka Textile-`02. Noakhali Textile-`09.

Ans:

i) DCP: DCP means draft change pinion. During carding if need to change draft, then pinion generally change. The no. of teeth of this changed DCP higher then draft will be less. If the draft is lower then the production will be higher but hank will be lower.
If the no. of teeth of this changed DCP is lower then it happens oppositely.
DCP(↑) → Draft (↓)→ Production (↑)→ Hank.

ii) Barrow wheel or PCW: PCW means production change wheel. By the help of PCW, production can be more or less. If we want to increase the production, the no. of teeth of the wheel should be increase & if we want to decrease the production, the no. of teeth of the wheel should be decrease.

Q. State the properties of Foundation mtl.

Ans:

1. Sufficient strength & elasticity.
2. Sufficient thickness & rigidity to hold the wires in position.
3. Sufficiently resiliency.
4. Resistant to oil, heat & moisture & premature ageing.

Q. How will you determine the count of flexible card clothing?

Noakhali Textile-`08.

Ans:

Count of card clothing can be determined in the following way.

1. The number of crown/inch in transverse row : 4.
2. By calculating the no. of crown/nogg rib set : 3.
3. By counting the no. of noggs of repeat in length wise in one inch : 25.

If 1, 2 & 3 are multiplied together we get the no. of crown/inch^2.

So, no. of crown $= 4 \times 3 \times 25$

$= 300$

As there are two points per crowns,

Wire point/inch^2 $= 2 \times 300$ No.s

$= 600$ No.s

$$\text{Wire count} = \frac{\text{point per square inch}}{5}$$

$$= \frac{600}{5}$$

$$= 120.$$

For fine yarn, wire count should be 120-130.

Q. What is can coiling? State it's objects.

Ans:

Can coiling: The process by which the delivered sliver is uniformly diposited in a sliver can in an orderly manner is called coiling or can coiling.

The slivers without coil formation if drawn from the card sliver can to the draw frame then definitely the slivers will result in fuzz & apparently would have hampered the production.

Object:

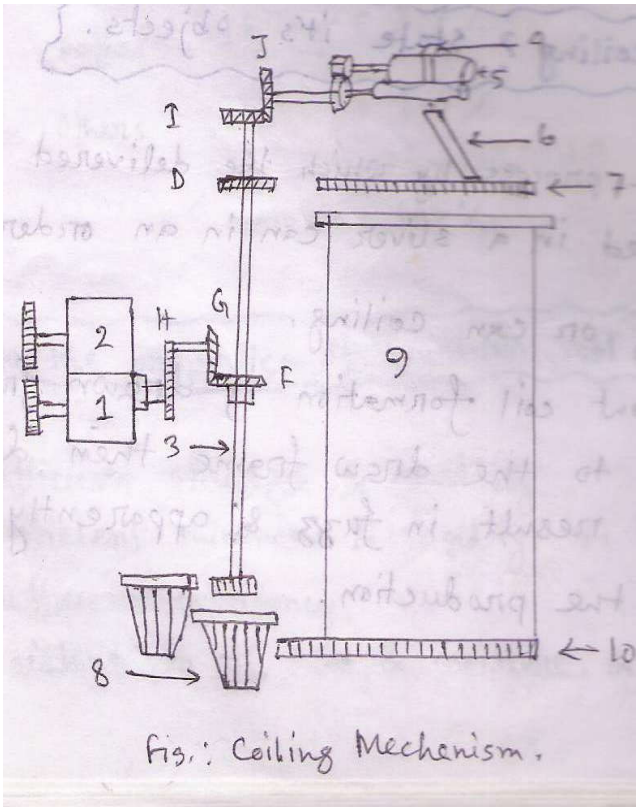
1. The function of coiler mechanism is to lay the condensed sliver delivered by the calendar rollers in an orderly manner in cylindrical can.
2. Sliver from the can may be pulled out at the next process without becoming entangled or stretched.

Q. Describe coiling mechanism with neat sketch.

Ans:

The sliver must be coiled in cans for storage & transport. The storage is performed in a particular mechanism which is known as coiling mechanism.

The figure shows the drive of coiler mechanism. The coiler get its drive from the bottom calendar roller shaft through a gear (H). This drives the vertical shaft through the level gear (G) & F. At the top of vertical shaft there is another two level gear (I) & (J) through which coiler calender roller gets the drive.



1. Bottom calender roller,
2. Top calender roller,
3. Vertical shaft
4. Coiler trumpet
5. Coiler calender roller.
6. Coiler tube
7. Gear on coler tube
8. Drive to the can plate
9. Can
10. Can plate gear.

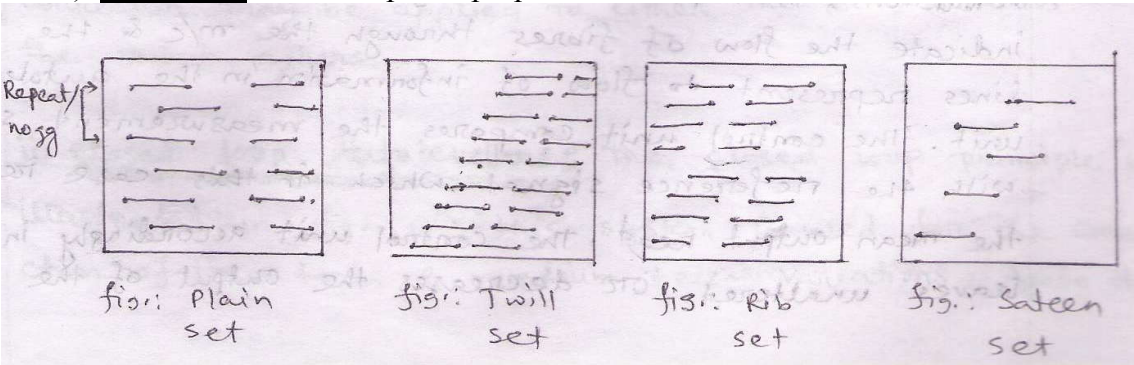
The two coiler calendar rollers are being pressed together to form a nip below the coiler trumpet. The coiler calendar rollers are driven at surface speed slightly higher than that of the calendar rollers so that is a tension in the sliver. A tube wheel (7) driven by gear (D). on the vertical shaft has an inclined tube (6) with its upper end below the coiler calendar roller, so that it can collect the sliver from the nip of coiler calendar roller. The lower end

of the coiler tube is provided with an exit for the sliver at a point near its periphery, so that the sliver lead is circular coil into the can. The can is positioned on a plate driven through reduction gearing from the bottom of the vertical shaft at a slow speed. The axis of the can is offset from that of the tube wheel.

Q. State different setting patterns.

Ans:

i) **Plain set:** Point density is higher in plain set. It is used in cylinder & doffer.
ii) **Twill set:** Used in flat.
iii) **Rib set:** Used in cylinder & doffer.
iv) **Sateen set:** Used for special purpose.



Q. What is auto leveller? Why it is used? Dhaka Textile-`04,`07.

Ans:

Auto leveller: Alternative name for autolevelling include autoregulator, draft , leveller. Although these different names are used by different machinery manufacturers, the basic principle remains the same.

Object: The object of an autoleveller is to measure the sliver thickness variations & then continuously to after the draft accordingly so that more draft is applied to thick places & less to thin places with the result that the sliver delivered is less irregular than it, otherwise would have been. Besides an improvement in production appearance, autolevelling can also contribute to better productive efficiency, fewer end-breakages in subsequent process, less waste & constant process conditions.

Q. How many type of auto leveller is used in carding? Describe them.

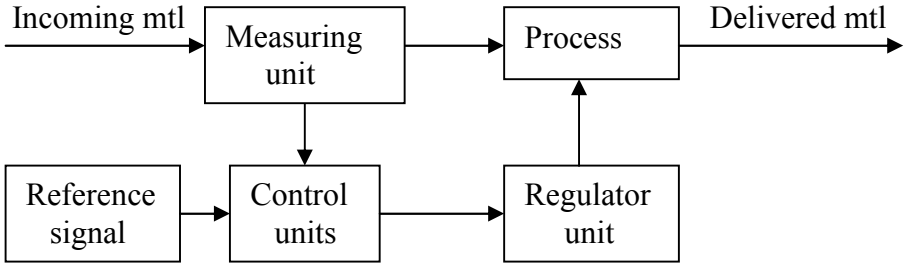
Dhaka Textile-`03(any one),`05(any one),`06(any one). Noakhali Textile-`08.(any one).

Ans:

Autoleveller may classified into two main groups according to the basic principle of operation –

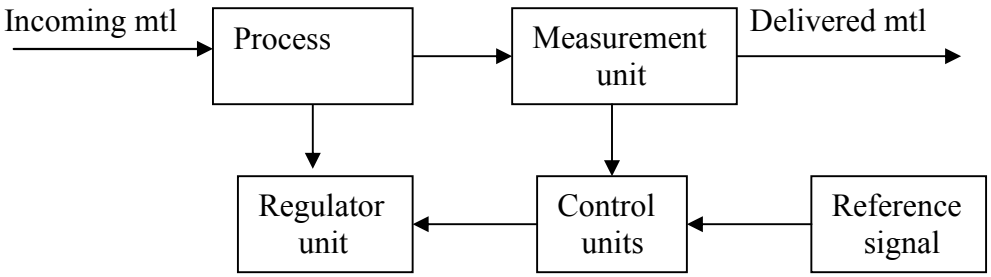
i) Open loop autoleveller: The open loop control principle, which can be used for the correction of fairly short term variations, is represented in fig→ (a), where the solid lines indicate the flow of fibres through the m/c & the broken lines represent to flow of information in the autoleveller unit. The control unit compares the measurement signal with the reference signal which in this case represents the mean output req^{d}. The control unit accordingly increases, leaves unaltered, or decreases the output of the regulatory

which in turn provides a variable speed to the back of front rollers of the process to give the req^{d} draft



Fig→(a) : Schematic diagram of open loop control system.

when the measured mtl has reached the point at which draft is applied. The magnitude & direction of each change in draft is determined by the magnitude of the change of count previously indicated by the measuring unit.
If the direction of the arrows in fig→ (a) is followed from any starting point, it always leads out into the open from the diagram at the place marked mtl by the control unit. Measurement always takes place on the mtl prior to the mtl. Thus if measurement is made on the input mtl, the correction may be applied to either the back rollers or the front rollers.
ii)<u>Closed loop Autoleveller:</u> The closed loop principle is illustrated in fig→ (b); this system is used for the correction of long term & medium term variations. Again the measurement signal is compared with the reference signal by the control unit which then determines the output of the regulator which provides the variable speed to the process to give the req^{d} draft.



Fig→(b) : Schematic diagram of closed loop control system.

However, if the direction of the arrows in fig→ (b), is following from any starting point except the delivery, is always leads to a never-ending circuit of the loop which links the process & the control unit together, hence the name closed loop; measurement always takes place on the mtl after the point where corrective action is applied. Thus if measurement is made on the output, the correction may be applied to either the back rollers or the front rollers.

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It is immediately apparent that the control unit contunually cheeks the results of its own actions because measurement is taken from the product of the process. This may be regarded as a basic advantage of the closed loop system, but it is obtained at the price of increased complexity.
Because the flow of fibres in the process forms part of the control loop, this means that the amount of control which can be applied is restricted not only by the limitations of the control unit itself, but the characteristics of the process.
A closed loop system must be designed so as to avoid hunting, i.e. an unwanted oscillation in the output, in this case sliver thickness.

Q. State the advantages of auto leveller.

Ans:

Advantages:

1. All variations are corrected.
2. Count c.v.% will be consistent & good, hence the yarn will be suitable for knitting.
3. Thin places in the sliver, hence in the yarn quality will be low.
4. Ring frame breaks will come down, hence pneumfil waste will be low.
5. Fluff in the department will be less, therefore uster cuts will be less.
6. Fabric quality will be good because of lower number of fluff in the yarn.
7. Labour productivity will be more.
8. Machine productivity will be more.
9. Idle spindles will be less.
10. RKM c.v.% will be low, because of low number of thin places.
11. Workability in warping & weaving will be good, because of less no. of thin places & lower end breaks in spg^n & winding.
12. Low sliver U%, hence yarn U% will be good.
13. Production will be more accurate in autoleveller draw frame compared to non autoleveller draw frame.
14. Variation in Blend percentage will be very less, if both the components are autolevelled before blending, hence fabric appearance after dyeing will be excellent.

Q. Write a note on fibre hooks. Noakhali Textile-`08.

Ans:

Fibres are processed during spg^n through a number of steps. During process of fibres, the fibres come into the contact of different surface are wire points (e.g. point against point action/point against back action) & thus results change i.e. the direction of fibre ends become bend or it looks like bend which is known as fibre hooks. The fibre hooks are determined to quality of the end product.

Types:

1. Leading hooks.
2. Middle hooks.
3. Trailing hooks
4. Both ends hooks.

Q. What is the another name of percentage plate? Why it is called so?
Noakhali Textile-`08.

Ans:
Front plate is the another name of percentage plate. It is called so, because the amount of strips removed by the flats can be regulated by the adjustable top section of the front plate.

Q. State the setting of percentage plate. Noakhali Textile-`08.

Ans:
The closer the settings between cylinder wire & percentage plate, less strips are removed. With the closer settings of the plate, the wire of the cylinder has a better grip in the fibre compared with wider setting addition, air velocity at a closer setting might help to keep more fibres on the cylinder surface.

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Mathematical Problem

Formula for mathematical problem:

1. $\text{Draft} = \frac{\text{Draft constant}}{\text{D.C.P}} = \frac{\text{Delivered length}}{\text{Feed length}}$

2. $\text{Total draft} = \frac{\text{wt. of mtl feed / yd}}{\text{wt. of mtl delivered / yd}}$

3. $\text{Actual draft} = \frac{\text{Hank delivered}}{\text{Hank feed}}$

4. $\text{Req}^{\text{d}}\ \text{D.C.P} = \text{Present D.C.P} \times \frac{\text{present Hank}}{\text{req}^{\text{d}}\ \text{Hank}}$

5. $\text{Req}^{\text{d}}\ \text{D.C.P} = \text{Present D.C.P} \times \frac{\text{req}^{\text{d}}\ \text{wt/ yd}}{\text{present wt / yd}}$

6. $\text{Req}^{\text{d}}\ \text{D.C.P} = \text{Present D.C.P} \times \frac{\text{Present draft}}{\text{req}^{\text{d}}\ \text{draft}}$

7. $\text{Actual draft} = \frac{\text{Total draft} \times 100}{100 - \text{waste\%}}$

8. $\text{Req}^{\text{d}}\ \text{draft} = \text{Present draft} \times \frac{\text{presentD.C.P}}{\text{req}^{\text{d}}\ \text{D.C.P}}$

9. Production / hr =

$$\text{Doffer r.p.m.} \times \text{Doffer dia(inch)} \times \pi \times \frac{60}{36} \times \frac{1}{840 \times \text{sliver hank}} \times \text{efficiency} \times \text{waste\%}$$

10. $\text{Technical draft} = \frac{\text{Surface speed of delivery roller (faster)}}{\text{surface speed of feed roller (slower)}}$

11. $\text{Actual draft} = \frac{\text{linear density (Tex) of input mtls (lap)}}{\text{linear density (Tex) of output mtls (sliver)}}$

$$= \frac{\text{Feed wt (grms) / unit length}}{\text{delivery wt. / unit length}}$$

$$= \frac{\text{delivery length (m) / unit wt.}}{\text{Feed length / unit wt.}}$$

12. Total draft = Main draft × web draft.

Q. Calculate the cleaning efficiency of carding from following data:
Trash in lap = 6.5 lbs
Trash in sliver = 1.5 lbs

Ans:

$$\text{Cleaning efficiency of carding} = \frac{\text{Trash in lap - Trash in sliver}}{\text{Trash in lap}} \times 100$$
$$= \frac{6.5 - 1.5}{6.5} \times 100$$
$$= 76.9\%$$
$$\approx 77\%(\text{Ans}).$$

Q. In a carding m/c D.C.P is 20 & draft constant is 2220. Find the draft of the m/c.

Ans:
We know,

$$\text{Draft} = \frac{\text{draft constant}}{\text{draft change pinion}}$$
$$= \frac{2220}{20}$$
$$= 111.\ (\text{Ans.})$$

Q. Find the req^{d} D.C.P from the following information-
Present D.C.P = 21T
Present Hank = 14
Req^{d} Hank = 18.

Ans:
We know,

$$\text{Req}^{d}\ \text{D.C.P} = \text{Present D.C.P} \times \frac{\text{Present Hank}}{\text{Req}^{d}\ \text{Hank}}$$
$$= 21 \times \frac{14}{18}$$
$$= 16\ \text{T}\ (\text{Ans.})$$

Q. Find out the D.C.P to produce 0.16 hank. If 58T D.C.P produce 0.18 hank sliver. Noakhali Textile-`08.

Ans:
We know,

$$\text{Req}^{d}\ \text{D.C.P} = \text{Present D.C.P} \times \frac{\text{Present Hank}}{\text{Req}^{d}\ \text{Hank}}$$
$$= 58 \times \frac{0.18}{0.16}$$
$$= 65\ \text{T}\ (\text{Ans.})$$

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Q. Calculate the production/hr in kg of 10 carding m/cs from the following informations –
Doffer r.p.m = 45, doffer dia = 27 inch, hank of sliver = 0.15^s Ne, waste extraction = 4% & efficiency = 90%. Dhaka Textile-`06. Noakhali Textile-`08.

Ans:

$$\text{Production/hr} = \frac{\pi \times 45 \times 27 \times 60 \times 90 \times (100-4)}{840 \times 36 \times 100 \times 100 \times 0.15}\text{lb}$$
$$= 43.60 \text{ lbs.}$$
$$= 19.78 \text{ kg.} \quad [\because 1\text{kg} = 2.204 \text{ lbs}]$$

$\therefore$ Production/hr of 10 carding m/c = $19.78 \times 10 = 197.8$ kg. (Ans.)

Q. Feed roller dia = 2.25 inch, Feed roller r.p.m = 4, Doffer dia = 27 inch, Doffer r.p.m = 30, Lap wt = 14 os/yd, Carding eff. = 90%. Find the prod^n/hr in lbs. Noakhali Textile-`08.

Ans:

$$\text{Lap hank} = \frac{1\text{yd} \times 1\text{lb}}{840\text{yds} \times \frac{14}{16}\text{lb}}$$
$$= 1.36 \times 10^{-3}$$
$$\text{Draft} = \frac{\text{Surface speed of delivery roller}}{\text{surface speed of feed roller}}$$
$$= \frac{\pi \times 27 \times 30}{\pi \times 2.25 \times 4}$$
$$= 90.$$

We know,

$$\text{Draft} = \frac{\text{delivery hank}}{\text{feed hank}}$$

$$\text{delivery hank} = 90 \times 1.36 \times 10^{-3} = 0.1224.$$

We know,

$$\text{Production/hr} = \frac{\pi \times D \times N \times 60 \times 90}{840 \times 36 \times 0.1224 \times 100}\text{lbs}$$
$$= \frac{3.14 \times 27 \times 30 \times 60 \times 90}{840 \times 36 \times 0.1224 \times 100}\text{lbs.}$$
$$\approx 37.11 \text{ lbs.(Ans.)}$$

Q. The surface speed of the coiler wender rollers calculated & found to be 39.1 m/min. If the linear density of the sliver is 4 kilo Tex (4kg/km). What is the production per hr at 80% efficiency.

Ans:

$$\text{Prod}^n = \pi DN \times \text{Efficiency} = 39.1 \times \frac{80}{100}\text{m/min}$$
$$= 39.1 \times \frac{80}{100} \times \frac{4}{1000} \times 60\text{kg/hr.}$$
$$= 7.50\text{kg/hr(Ans.)}$$

Q. Here, doffer r.p.m = 1, Dia = 27 inch, sliver wt = 1grain/yds. Tension draft = 1. Find the production constant at 85% eff.

Ans:

$$\text{Prod}^n \text{ constant} = \frac{\pi DN \times 60 \times \text{eff.} \times \text{sliver wt./grain} \times \text{tension draft}}{36 \times 100 \times 7000}$$
$$= 0.017 \text{ (Ans.)}$$

Q. Calculate the prod^n in card from the following details –
doffer r.p.m = 9.95, sliver wt 50 grains/yd, prod^n const. 0.017, tension draft 1.03, efficiency 85%

Ans:

$$\text{Prod}^n = \text{Prod}^n \text{ constant} \times \text{dofferr.p.m} \times \text{T.D} \times \text{sliver wt. gr/yd}$$
$$= 0.017 \times 9.95 \times 1.03 \times 50$$
$$= 8.71 \text{ lbs. (Ans.)}$$

Q. Feed mtl wt. (lap wt) = 14 oz/yd, total draft of m/c = 105, doffer speed = 30, dia = 27 inch, eff. 85%. Calculate prod^n in lb/hr.

Ans:

$$\text{Lap hank} = \frac{1 \times 1}{840 \times \frac{14}{16}}$$
$$\therefore \text{Feed hank} = 1.36 \times 10^{-3}$$
$$\text{Draft hank} = \text{draft} \times \text{feed hank}$$
$$= 105 \times 1.36 \times 10^{-3}$$
$$= 0.1428$$
$$\text{Prod}^n/\text{hr} = \frac{3.14 \times 30 \times 27 \times 60 \times 85}{840 \times 36 \times 0.1428 \times 100}$$
$$= 30.04 \text{ lbs (Ans.)}$$

Q. Find the total prod^n of a carding m/c for 1 hr with following details: doffer r.p.m = 10, dia = 27 inch, sliver hank = .15, eff. =90%.

Ans:

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$$\text{Production/hr} = \frac{\pi \times D \times N \times \text{eff.} \times 60}{36 \times 840 \times \text{count}} \text{ lbs}$$
$$= \frac{3.14 \times 27 \times 10 \times 60 \times 90 \times 1}{36 \times 840 \times 100 \times .15} \text{ lbs}$$
$$= 10.098 \text{ lbs (Ans.)}$$

Q. Find the prod^{n} of a carding m/c for 8hrs with the help of following data: c. roller r.p.m = 80, dia = 4 inch, sliver hank =.14, eff. = 85%, tension draft =1.05. Dhaka Textile-`02. Noakhali Textile-`09.

Ans:

$$\text{Production} = \frac{3.14 \times 80 \times 4 \times 0.85 \times 60 \times 8}{36} = 11393.536 \text{ yds/8hrs}$$

$$\therefore \text{Prod}^{n} \text{ of Coiler Calender roller} = 11393.536 \times 1.05 \text{ yds/8hrs.}$$
$$= 11963.213 \text{ yds/8hrs.}$$

$$\therefore \text{Prod}^{n} \text{ of carding m/c} = 11963.213 \times \frac{1}{.14 \times 840} \text{ lb/8hrs.}$$
$$= 101.72799 \text{ lbs/8hrs. (Ans.)}$$

Q. Find sliver wt. & sliver hank –
wt of lap = 14 oz/yd, card draft = 100, wastage 4%. Dhaka Textile-`02,`04.

Ans:

We know,

$$\text{Draft} = \frac{\text{wt. of feed}}{\text{wt. of delivery}} \times \text{wastage}$$

$$\text{wt. of delivery} = \frac{\text{wt. of feed}}{\text{draft}} \times \frac{100 - 4}{100}$$
$$= \frac{14}{100} \times \frac{96}{100} \text{ oz/yd}$$
$$= 0.134 \text{ oz/yd (Ans.)}$$

$$\therefore \text{Sliverhank} = \frac{1}{\frac{0.134}{16} \times 840} = 0.142. \text{ (Ans.)}$$

Q. In a carding m/c it produce sliver wt. of 60 gr/yds when its DCP is 17. To produce sliver wt. of 70 gr/yds then how many teeth of D.C.P should be used? Noakhali Textile-`09.

Ans:

$$\text{Req}^{d}\ \text{D.C.P} = \text{Present D.C.P} \times \frac{\text{req}^{d}\ \text{wt of sliver}}{\text{present wt. of sliver}}$$

$$= 17 \times \frac{90}{60} = 25.5$$

$$\approx 26\ (\text{Ans.})$$

Q. The present produced sliver hank of a carding m/c is 0.16. Present D.C.P 18T. If req^{d} DCP is 22T, then calculate the sliver hank (required)

Ans:

$$\text{Req}^{d}\ \text{sliver hank} = \text{Present sliver hank} \times \frac{\text{Present D.C.P}}{\text{req}^{d}\ \text{D.C.P}}$$

$$= 0.16 \times \frac{18}{22}$$

$$= 0.130\ (\text{Ans.})$$

Q. The waste of a carding m/c is 6% & produce sliver of 0.17 hank from lap 13 oz/yds. Calculate the mechanical of m/c.

Ans:

$$\text{Lap hank} = \frac{\text{length of lap}}{840 \times \text{wt. of lap}} = \frac{1}{840 \times \frac{13}{16}} = 0.00146.$$

$$\text{Actual draft} = \frac{\text{carding sliver hank}}{\text{lap hank}}$$

$$= \frac{0.17}{0.00146}$$

$$= 116.43.$$

$$\therefore \text{Mechanical draft} = 116.43 \times \frac{100 - 6}{100}$$

$$= 109.04\ (\text{Ans.})$$

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