Blow Room

Q. Write short note on "Blow Room" Dhaka Textile-`05.

Ans :

Blow Room : Blow room consists of a number of m/cs used in succession to open & clean the cotton fibre to the required degree. 40 to 70% trash is removed in this section.

A section in which the supplied compressed bales are opened, cleaned & blending or mixing to form uniform lap of specific length is called Blow room section. The cleaning efficiency of blow room is 60 to 65%. This is the first section of spinning line for spg^{n} wt cotton yarn.

Q. Mention the object of Blow room. Dhaka Textile-`02

Ans :

1. To open the fibres.
2. To clean the fibres.
3. To produce sheet of lap for facilating the feed to the next process.

Q. Discuss the operations are operated in Blow room.
Dhaka Textile-`05. Noakhali Textile- 09.

Ans :

1. Opening :

a. To open the compressed bales of fibres &

b. To make the cotton tuft a small size as far as possible.

2. Cleaning : To remove the dirt, dust, broken seeds, broken leafs, stalks & other foreign materials from the fibres.

3. Blending or Mixing : To make good value of yarn & to decrease the production cost by mixing different grade of fibres.

4. Lap forming :

a. To transfer the opened and cleaned fibres into a sheet form of definite width & uniform unit length which is called lap.

b. To roll the lap of predetermined length in a cylindrical shape around a lap pin.

c. To transfer the lap from the lap pin to a rod to suitable handle & feed it to subsequence processing carding m/c.

Q. Discuss about the Action in Blow room.

Ans :

The actions of the m/c in any blow room range fall into one or more of four main groups namely :

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

1. Action of opposite spike : (Opening)
The action of opposite spikes is opening the cotton fibre. By this action, the large pieces of cottons have been reduced in size.
2. Action of Air current : (Transfer + cleaning)
During processing, the movement of cotton from m/cs to m/c is done by air current. It is also helps the separation of lint & trash.
3. Action of Beaters : (Cleaning & opening)
Beaters are responsible for removing almost all of the impurity extracted in the blow room. Beater also helps in opening of cotton fibre.
4. Action of regulation motion : (Uniform output)
The action of regulation motion gives the uniform output of cotton fibre by the help of swing door & swing paddle.

- Electrical photocell.
- Air pressure system.

Q. What are the function of Blow room?

Ans :
(a) Feeding,
(b) Beating/opening
(c) Transporting/transferring,
(d) Lap sheet formation.

Q. Mention the m/cs are used for opening in Blow room.

Ans :
Conventional bale opener –
(a) Multiple Bale opener (Hergeth mixer)
(b) Automatic Bale opener (Blandomar) → Troztlerco.
(c) Unifloc → Retier.

Q. What are beating or cleaning points in Blow room?

Ans :
(a) Ultracleaner/stepcleaner/super cleaner.
(b) Axiflow cleaner.
(c) Saw toothed beater.
(d) Bladed beater.
(e) Porcupine beater.
(f) Mono cylinder.
(g) Multimixer.
(h) Krischner beater.
(i) Twin opener.
(j) Vertical opener.
(k) E. R. M. cleaner.

Q. Mention the factors in which the intensity of opening depends.

Dhaka Textile-`02,`04. Noakhali Textile-`08.

Ans :

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

(A) Raw Materials :

(a) Thickness of the feed.
(b) Density of the feed.
(c) Fibre coherence
(d) Fibre alignment
(e) Size of flocks

(B) M/cs / Devices :

(i) Types of feed
(ii) Form of feeding device
(iii) Type of cleaning device
(iv) Arrangement of pins

(C) Speed :

(i)Speed of the device.
(ii)Through put speed of material.

(D) Others :

(i) Humidity.
(ii) Temperature.

Q. Mention opening devices are used in B/R

Ans :

(a) Roller → Small diameter. i.e. Step cleaner.
(b) Drums → Larger diameter. i.e. Mono cylinder.
(c) Multiple beater → Two or three arms. i.e. Krischner beater.
(d) Spiked lattice → Endless belt. (very gentle opening).
(e)

Q. Mention the associated or Auxiliary equipments used in modern blow room line. Dhaka Textile-`02

Ans :

(a) Hopper feeder. (b) Reserve box.
(c) Condenser or condensing cage (d) Exhaust fan
(e) Feed regulating motions (f) By-pass system.
(g) Filter room.

Q. Write down the working principle of Ultra cleaner or step cleaner or super cleaner m/c for a modern blow room with near sketch. Noakhali Textile-`09.

Ans :

Objects :

- To open & clean cotton tuft by opposite spikes & beating action.
- To remove heavy impurities such as leaves, sand without damaging the fibre.
- To make/convert the cotton tuft to small size of cotton fiber.

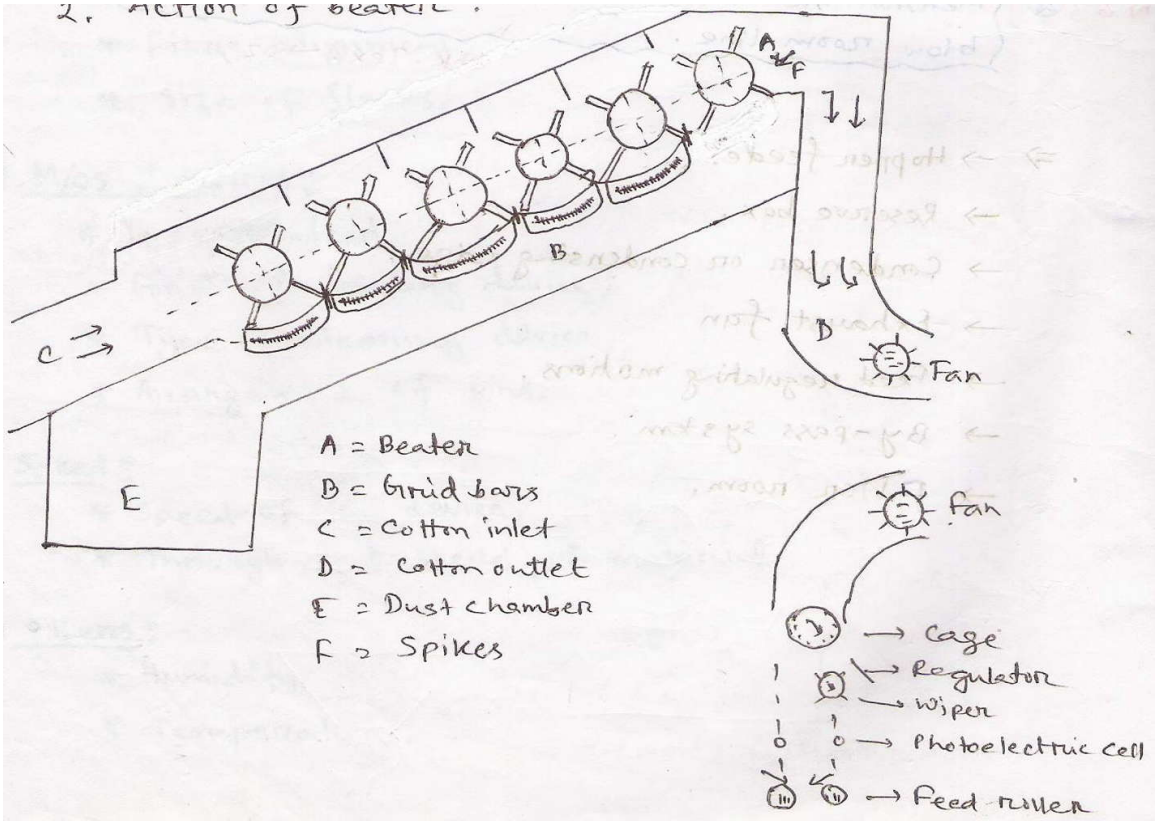
PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

• To clean the cotton suitable for processing to the next m/c.

Basic function :

Opening and cleaning are lead by the following two actions-

1. Action of opposite spikes.
2. Action of Beater.



Working Principle :

• The cotton or mtls falls into the feed hopper.

• Passes to the first beater.

• Then it is transported upwards by the six beater rollers, each carrying profiled bars & the beaters are arranged on a line inclined upwarf at 45^0.

• The trashes are extracted by the help of opposite spike & bearing function extracts the trashes & falls into the chamber through grid bars hole.

• Cotton tuft open & make small sixe tuft with beating action.

• A buckle is in the middle of per two beaters & it control flow of material.

M/c parameter :

1. Super cleaning.
2. Cleaning efficiency 80%.
3. Mtls transport through air current.
4. No. of beater is 6 (normally).

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

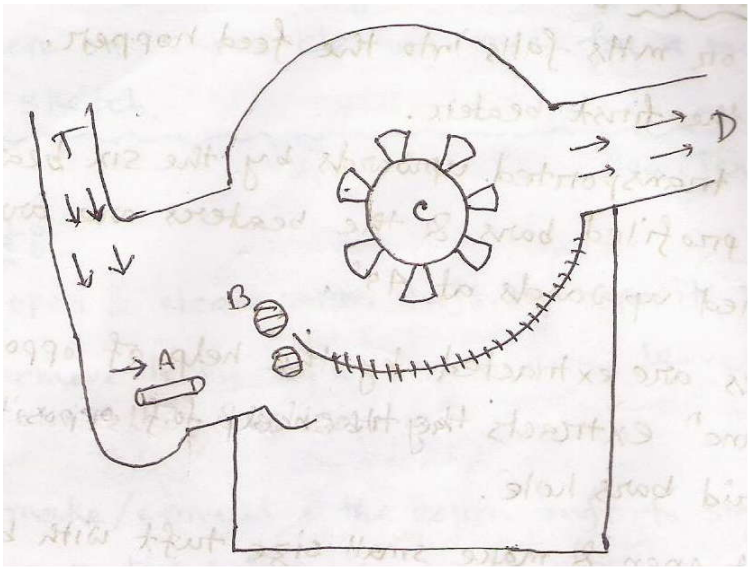
5. Beater speed 650-500 rpm.
6. Cleaning ability is high.
7. Application for all grades of cotton.

Q. Write a short note on Porcupine Beater.

Ans :

Function :

- Good opening beater.
- Considered most suitable for long staple cotton.
- The striker are arranged at different angles to cover the total width of the m/c in one revolution of the beater.



Parts :-
A = Feed Lattice.
B = Feed roller.
C = Beater.
D = Cotton outlet.
T = Cotton inlet.

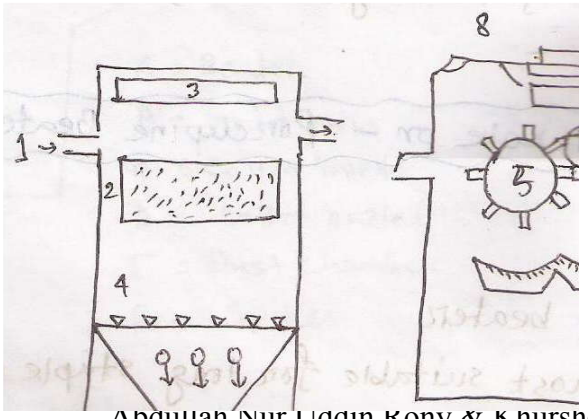
- Revolution per minute of beater 750-960.
- To separate the fibres by striker.
- To clean the fibres.

Q. Describe the function of Axi-flow cleaner for B/R.

Dhaka Textile-`02,`03,`04,`07.

Ans :

1. Inlet pipe.
2. Beater roller.
3. Deflector.
4. Grids.
5. Guide plate.
6. Bucket wheel lock
7. Outlet pipe.



M/c Specification :

1. It has a large cleaning chamber.
2. Contains two drums of 610 mm dia rotating in the same direction.
3. There is a fan/Bucket wheel down stream from the dual Roller cleaner/Axi-flow cleaner, draws mtl through the m/c by suction.
4. The exit opening is arranged at a higher level than the infeed opening.
5. The spikes are arranged in a spiral order on the drums in order to improve the passage of the mtl.

Working principle :

The condenser which follows in the line sucks the tuft through the initial pipe into the large cleaning chamber of AFC where the suction force decreases. The outlet pipe is located at a higher level than the inlet opening. So, the suction stream is only able to carry small tufts, which are already sufficiently opened & cleared. Thus the fibre leaves the AFC quickly without undergoing any beating action. Fibres contained in large tufts fed once or more over the grid bars before they leave the m/c. They remain in the sufficiently long time to be opened into small tufts, which releases their impurities easily.

Q. What do you mean by Major & Minor beating point?

Noakhali Textile-`08.

Ans :

When we use a beater to clean fibre then it is called major beating point. e.g. Step cleaner, Porcupine beater, Krischner beater etc.

But when we use a beater to open the fibre, but some cleaning is occurred then it is called minor beating. e.g. Bale plucker, Bale opener, Saw toothed beater, condenser etc.

Q. State the Blow room line for low grade cotton.

Ans :

Bale breaker
↓
Conveyor belt
↓
Hopper feeder
↓
Porcupine opener
↓
Double crighton opener
↓

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

Fan
↓
Hopper feeder
↓
Just tank
↓
Porcupine beater (2 no.)
↓
Three bladed beater
↓
Mouth piece
↓
Two way distribution
↓
Condenser
↓
Hopper feeder with reserve box
↓
Scutcher

Q. State the blow room line for medium grade cotton.

Ans :

Bale opener
↓
Hopper feeder
↓
Porcupine opener
↓
Crighton opener
↓
Cage condenser
↓
Hopper feeder
↓
Porcupine beater (2 no.)
↓
18” beater
↓
Dust tank
↓

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by ‘**www.bdtextileinfo.blogspot.com**’

Two way distribution
↓
Hopper feeder with reserve box
↓
Scutcher

Q. State the blow room line for high grade of cotton.

Ans :

Bale breaker
↓
Hopper feeder
↓
Porcupine opener
↓
Two way distributor
↓
Hopper feeder with reserve box
↓
Scutcher

Q. State modern Heavy/ coarse line for cotton.

Ans :

Heavy/coarse line (Lap feed) :

GBR (Bale opener)
↓
Axi-flow cleaner (AFC)
↓
RN beater
↓
RSK beater
↓
Scutcher

Q. State modern fine line for chute feed.

Ans :

GBR (Bale opener)
↓
Axi-flow cleaner (AFC)
↓
Multi-mixer

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

↓
Separator (ASTA)
↓
Cleanomat (CVT_3)
↓
Dustex
↓
Chute feed

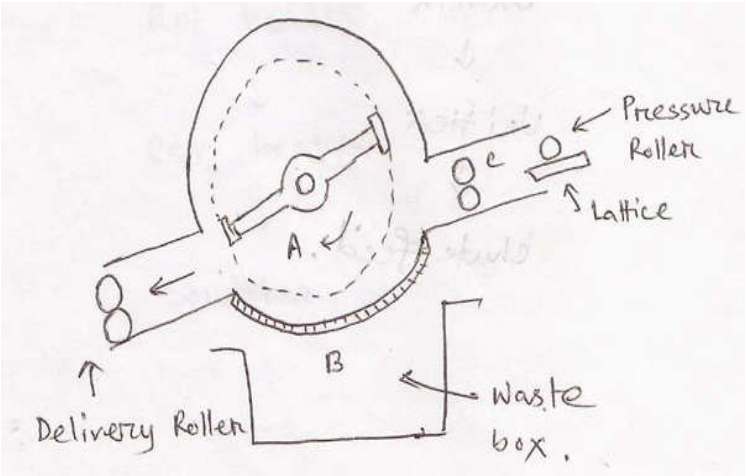
Q. State the Reiter blow room line for chute feed.

Ans :

Unifloc
↓
Uniclean
↓
Unimix
↓
Uniflex
↓
Chute feed.

Q. Write a note on Two bladed beater.

Ans :



A = Two bladed beater.
B = Grid bar.
C = Feed Roller.

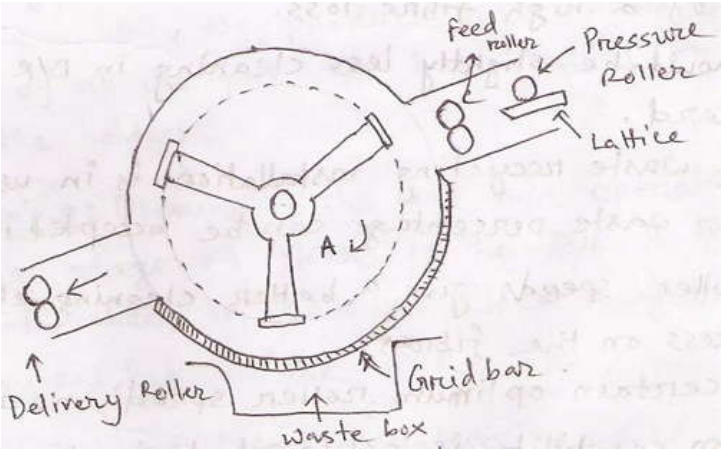
- Two blades are arranged in both sides and equal distance of shaft.
- Cotton tuft are passed through feed roller.
- Then the beater rotate several times until the cotton tufts are not made into small tufts or individual fibre.
- Then it is delivered to the next m/c through delivery roller.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

- The seeds or trash are stored in waste box through Grid bar.
- Revolution per minute 800-850.
- To clean broken seeds or heavy impurities of fibre.

Q. Write a note on Three bladed beater.

Ans :



A = Three bladed beater.

- Similar to two bladed beater.
- Three blades are arranged in both sides and equal distance of shaft.
- It is more effective than two bladed beater.
- Cotton fibre are passed through feed roller.
- The beater rotate several times until the cotton fibre are not made into small tufts or individual fibre.
- Then it is delivered to the next m/c through delivery roller.
- The seeds or trash are stored in waste box through Grid bar.
- Revolution per minute is 850-940.

Q. Write down the influencing factors in cleaning.

Ans :

(a) The larger the dirt particles, the better they can be removed. Since almost B/R m/c can shatter particles, as far as possible a lot of impurities should be eliminated at the start of the process.
(b) Opening should be followed immediately by cleaning.
(c) The higher the degree of opening, the higher the degree of cleaning.
(d) A very high cleaning effect is almost always purchased at the cost of a high fibre loss.
(e) There should be slightly less cleaning in B/R & slightly more at the card.
(f) Where a waste recycling installation is in used, a somewhat higher waste percentage can be accepted in the B/R.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

(g) Higher roller speeds give a better cleaning effect. But also more stress on the fibres.
(h) Above a certain optimum roller speed, no improvement of elimination capability is achieved, but stressing of the fibres goes on rising & so does fibre loss.
(i) Cleaning is made more difficult if the impurities of dirty cotton are distributed through a larger quantities of mtl by mixing with clean cotton.
(j) Damp stock can`t be cleaned as well as dry. High mtl throughput reduces the cleaning effect &so does a thick feed sheet.

Q. Write down the basic operations involved in B/R (in short).

Ans :

Feeding
↓
Opening (by action of opposite spikes)
↓
Cleaning (by action of beater)
↓
Blending
↓
Dust removal (by action of air current)
↓
Transporting/Transferring
↓
Lap sheet formation
(i) Scutcher(fixed) intermittent.
(ii) Chute feeding (continuous).

Q. Describe briefly about the operations involved in B/R.

Ans :

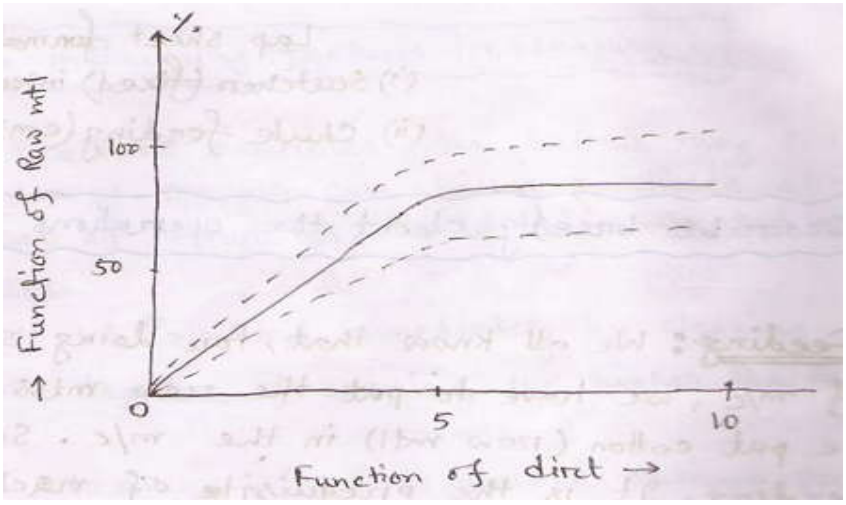
1. **Feeding:** We all know that, For doing something by the help of m/c, we have to put the raw mtls in the m/cs. In B/R we put cotton (raw mtl) in the m/c. So, this process is called feeding. It is the perquisite of machinery working. As for example – when we produce nuts & bolts by using lathe m/c, first of all we put the base metal or feed the base metal into the holder.
2. **Opening:** Opening is the 1st m/c operation reqd, carried out to the stage of flocks in the B/R & to the stage of individual fibres in the card. Flock weight can be reduced to about 0.1mg in the B/R.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

3. **Cleaning:** A B/R installation removes approximately (40-70)% of the impurities. The result is dependent on raw mtl, on the m/cs & on the environment conditions. From the graph, cleaning effect cannot & should not be same for all impurity level, since a lot of dirt can be removed more easily than a little. In order to clean, it is necessary to eliminate about as much fibre as foreign mtls. Percentage of total mtl eliminated, in cleaning efficiency.

$$C_E = \frac{A_T - A_E}{A_T} \times 100$$

$$= \frac{\text{Total waste} - \text{Good fibre eliminated}}{\text{Total waste}} \times 100$$



Cleaning points:

Each m/c in the B/R line is known as a point either as opening or as beating points. Beating/cleaning points are classified under "major cleaning points" while others under "minor cleaning points" are not as important. In fact, they prepare the mtl ready for the major points to do a through job. In other words, it will be more correct to say that a minor points either its immediately following major point forms one unit. In some B/R lines, sometimes there are two or more minor points followed by a major one. Such an arrangement is made to open the cotton clean the tufts as thoroughly as possible without causing any damage to the basic fibre characteristics. This points should be note throughout the entire cotton process. This is the key point for which so many m/cs & their careful manipulation of speeds, settings are required. To achieve this objective with greater efficiency, modern B/R m/cs have been developed which is based on scientific theories & approaches. The major cleaning points of the conventional B/R line are crighton opener, porcupine opener, two or three bladed beaters & krischner beater etc. other m/c such as Hopper feeder, condensers. Dust cages, pneumatic delivery boxes, Shirley cages & scutchers etc are arranged as minor points. The minor points are in reality doing the function of teasing & opening the lumps ^ thus are reducing them in size so as to prepare the mtl ready for the beater that follows. More points

do not mean more cleaning. Stringly laps often indicate excessive beating action & there is every chance of the fibres getting over processed & weakend. The process of opening & cleaning are not two distinct process. In some m/cs, these processes are almost simultaneously in operation. It is therefore evident that cotton can't be cleaned or its impurities be eliminated unless opening is first effected.

4. **Blending:** Fibres can be blended at various stages of the process. These possibilities should always be exploited. For example, transverse doubling. The start of the process is one of the most important stages for blending. Intensive blending in a suitable blending m/c must collect the sequentially arriving bunches of fibres from individual bales and mixes them througly.
5. **Dust Removal:** Almost all manufactures of B/R machinery now offer dust removing machines or equipments in addition, opening and cleaning. Dust removal is not an easy operation, since dust particles are completely enclosed in the flock and hence held back during suction.

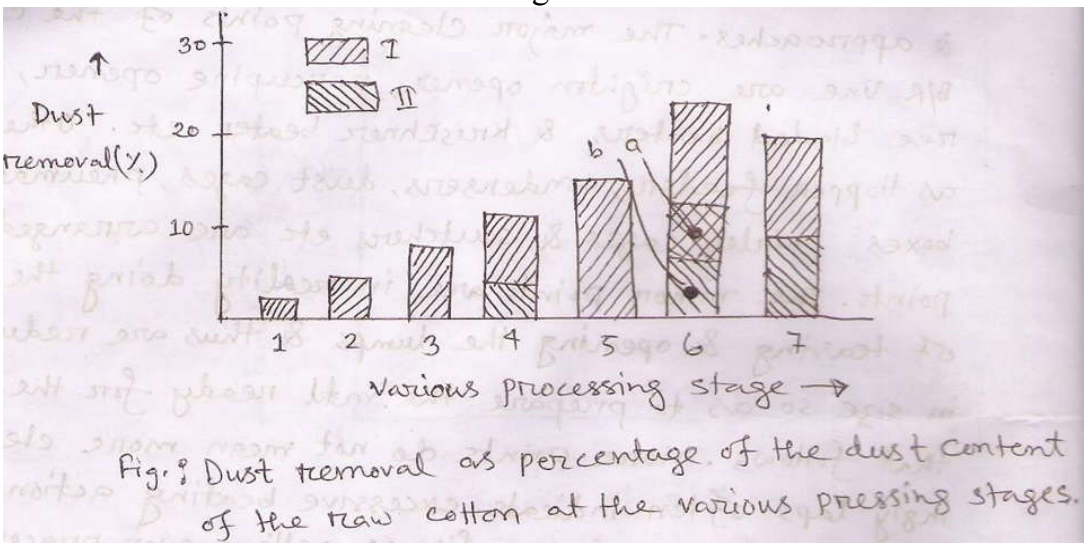


Fig.: Dust removal as percentage of the dust content of the raw cotton at the various pressing stages.

Here, 1-5 = B/R m/cs.
6 = Card,
7 = Draw frame (I) + (II)
a = Filter
b = Taker-in
I = Dust in the waster.
II = Dust in the exhaust air.

6. **Transporting/Transferring:** To transfer the opened & cleaned fibres into a sheet form of definite width & uniform unit length. In this step, mtls are transported from one to another m/c. There is also the transfer of lap from the lap pin to a rod to suitable handle for facilation the feeding of next process i.e. carding.
7. **Lap sheet formation:** In this step, lap is formed which is in a sheet form of definite width & uniform unit length. After forming lap, it is rolled in a

cylindrical shape around a lap pin. Lap sheet formation is formed in two ways –

a. Scutcher (fixed) intermittent.
b. Chute feeding (continuous).

Q. Write a short note on "opening".

Ans :

Opening: Opening is the first operation in the B/R carried out to the stage of flocks in the B/R & to the stage of individual fibres in the cards. It is the 1st operation after feeding the raw mtls into m/cs.

Degree of opening: Two stages of opening must be distinguished:-

1. Opening to flocks: In the blowing room.
2. Opening to fibres: In the card & opened spinning m/c.

In addition, the technological operation of opening can include opening out in which the number of fibres remains constant i.e. the sp. Density of the mtl is reduced or breaking apart in which two or more flocks are formed from one flock without changing the sp. Density.

Breaking apart would suffice for cleaning but opening out is needed for blending& aligning. Both opening out & breaking apart are front in each opening operation the degree of each is decisive. If, at the in feed to the card, there is a flock which has been mainly broken apart but relatively little opened out, then staple shortening will quite certainly result. To enable an exact evaluation of the degree of opening, therefore, both a measure of breaking apart (i.e. the size of the flock) and a measure of density (in gm/cm^3) would be needed. Since both measures can be obtained only with considerable effort, the specification of the mass (in mg/flock) usually has to suffice.

Q. Write a short note on "Cleaning".

Ans :

In cleaning, it is necessary to release the adhesion of the amities to fibre & to give the particles on opportunity to separate from the stock. The former is achieved mostly by picking of flocks out of the feed mtl & by rapid acceleration of these flocks; the later is achieved, for example, by leading the flocks over a grid. Dirt, dust, foreign matter & neps should be eliminated. Cleaning was always an important. Due to m/x harvesting, cotton contains more & more impurities which furthermore are shattered by hard ginnig. Almost all new spgn process, place substantially, get higher demands on the cleanliness of the mtl than the conventional process.

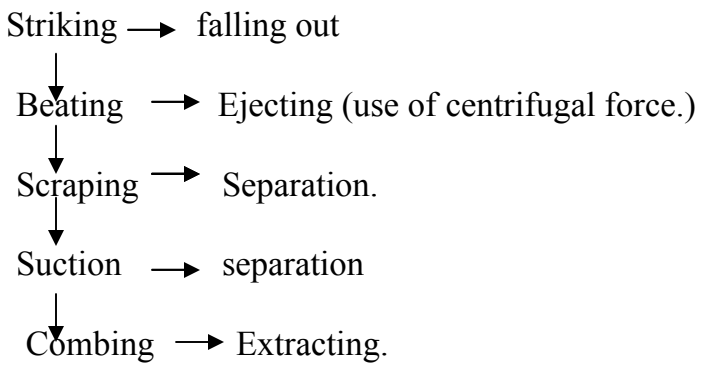
Q. Write down the possibilities/classification of cleaning.

Ans :

The available possibilities for cleaning of natural fibres can be divided broadly into 3 groups:

i) Chemical cleaning.
ii) Wet cleaning (washing)
iii) Mechanical cleaning.

By mechanical cleaning process, only particles on the surface of the flocks can be removed. The following procedures can be used:



Striking: Striking. Carried out by pins, noses etc, on the opening devices, leads to repeated collisions of the flocks with the grid bars, causing foreign particles to go through.

Beating: In a beating operation, the flocks are subjected to a sudden strong blow, The inertia of the impurities is substantially greater than that of the opened flocks due toe the low air resistance of the impurities. The latter are hurled against the grid & because of their small size, they pass between the grid bars into the waste box, while the flocks continue around the periphery of the rotating beater.

Scraping: Impurities can be scarped off when the fibres are guided, under relatively high friction, over m/c components, grid bars, mote knives or even other fibres. This operation is mainly important in dust removal.

Suction: Suction is less suited to the elimination of coarse particles than to extraction of dust. Transport air is fed through filters or perforated sheets. The small dust particles which has been released during beating or transport, pass with the air through the fine openings. The flock cannot pass.

Combing: In combing, needles pass completely through the body of fibres & draw impurities out of the inner regions of fibres. This is the only form of mechanical cleaning in which regions other than simple surfaces are cleaned.

Q. What is degree of cleaning? Dhaka Textile-`08

Ans :

Degree of cleaning is determined by cleaning index.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

$$\therefore \text{Cleaning index, } C_T = \frac{D_F - D_D}{D_F} \times 100\%$$

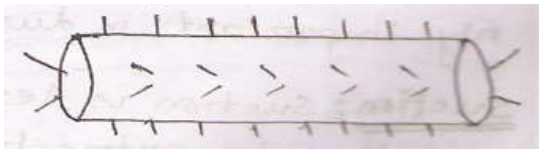
Here, D_F = The dirt content of the feed mtl.
D_D = The dirt content of the delivered mtl.
T = Total.

The dirt content is usually determined with the aid of the shirley analyzer. The cleaning index is strongly dependent on the dirt content but not solely. The cleaning index may be different for different cotton types with the same dirt content. There are types which can be cleaned easily & other which can be cleaned only with difficulty.

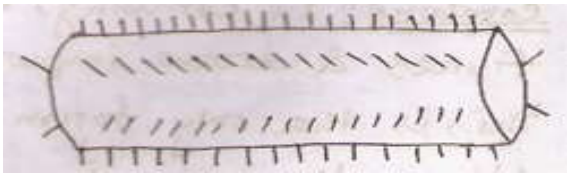
Q. Write down the type, appearance & description of opening devices.

Ans :

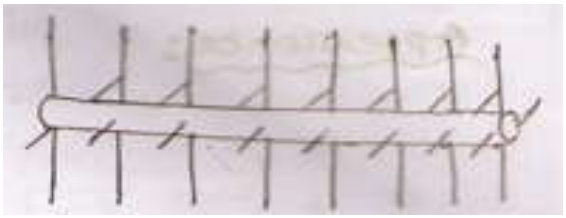
1. **Type;** Roller.
   Appearance:
   Description: Small diameter, widely used. e.g. in step cleaner.



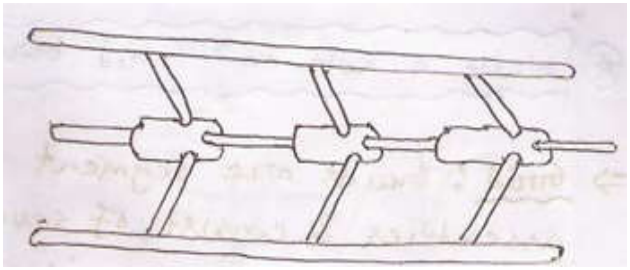
2. **Type;** Drum.
   Appearance:
   Description: Large diameter, little used. e.g. in monocylinder cleaner.



3. **Type;** Quilled shaft.
   Appearance:
   Description: Shaft with many long beater rods hardly used.



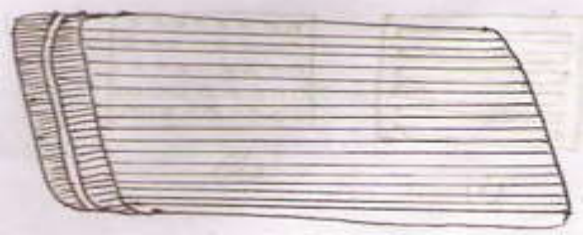
4. **Type;** Multiple bladed beater.
   Appearance:
   Description: Two, three or more arms . Now used mostly only in krishner beater.



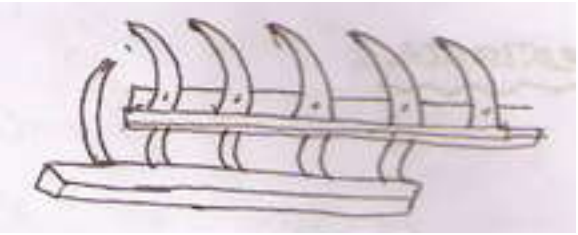
5. **Type;** Carding bars/plates.
   Appearance:
   Description: This devices associated with the carding drums of the card.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

6. **Type;** Spiked lattice.
   Appearance:
   Description: Endless belts with transverse woden or plastic bars in which needles are set, gives very gentle opening.



7. **Type;** Pluckers.
   Appearance:
   Description: In the trutzchler bale plucker & the Inglostradt blending grab.



Q. Write a note on "Grid bars". Noakhali Textile-`09.

Ans :

Grid: Grids are segment shaped devices under the opening assemblies & consist of several individual polygonal bars or blades and together these form a trough. The grid encircles at least ¼, at most ¾ and usually 1/3 to ½ of the opening assembly.

Types: The following types of grid are used in m/c :-

1. Slotted sheet,
2. Perforated sheet,
3. Triangular section bars,
4. Angle bars,
5. Blades.

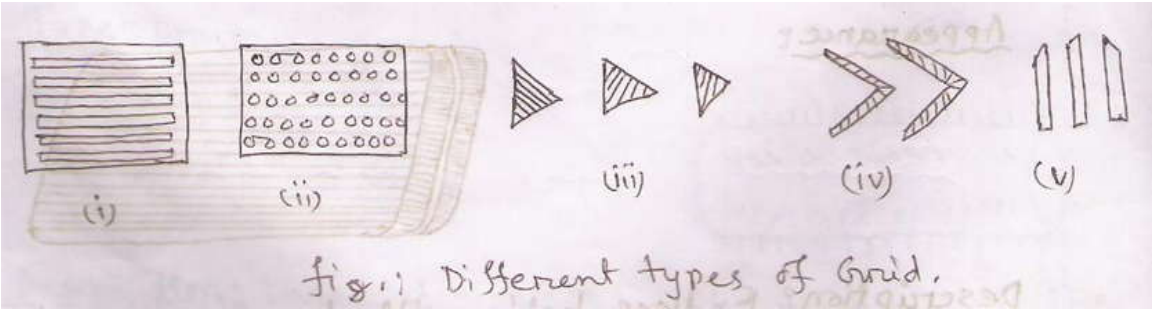
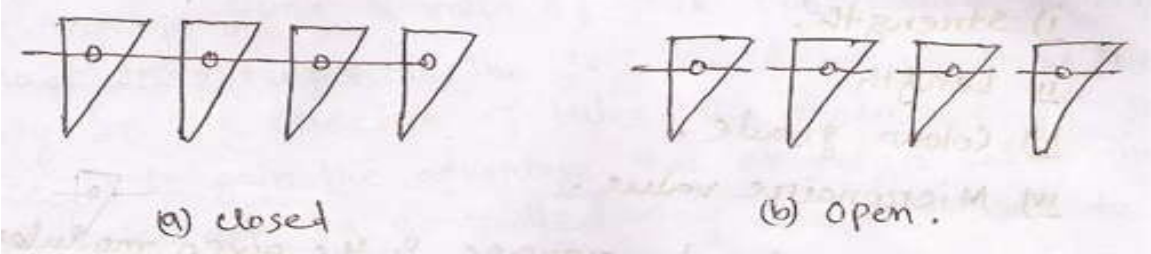


fig:1 Different types of Grid.

Adjustment: The grid can be in one, two or three parts. Correspondingly, it can be adjusted only as a unit or in individual sections. Three basic adjustment are possible-

(i) Distance of the complete grid to the beater.
(ii) Width of the gaps between the bars.



(iii) Setting angle relative to the beater.

Q. Write a note on "Bale management system".

Ans :

Bale management: Bale management is defined as the choice of cotton bales according to the fibre characteristics in order to achieve acceptable & economical processing conditions & a consistant yarn quality.

Objects:

1. To acquire a improved knowledge of the quality characteristics of a yarn.
2. A mean of avoiding quality jumps.
3. A possibility of reducing costs as a result of an improved knowledge of the fibre characteristics.

Importance: If bale management is absent –

1. Lot to lot variation is called fabric barre effect.
2. In weaving, shade variation.
3. In knitted yarn, colour variation.

Procedure of Bale management/managing bales; To manage the bales we need four modules of fibres & the relation exist between fibres & yarn.

i) Strength.
ii) Length.
iii) Colour grade.
iv) Micronaire value.

If there is 300 bales to manage & the given modules are –

Bale no.	M.V.	Colour grade	SCI
1	4.0	G.M	100
2	4.1	M.	105
3	4.2	S.M.	109

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

4	4.3	L.M.	112
”	”	”	”
”	”	”	”
300	4.5	G.O.	115

If the 300 bales can be managed for 10 days taking 30 bales per day then.

M.V.	Colour grade	SCI	No. of bales
4.0	G.M	100	100
4.1	M.	105	50
4.2	S.M.	109	100
4.3	L.M.	112	$\frac{50}{300}$

For 30 bales/mixing,

M.V.	Colour grade	SCI	No. of bales
4.0	G.M	100	10
4.1	M.	105	5
4.2	S.	109	10
4.3	L.M.	112	$\frac{5}{30}$

Q. What is SCI & BIAS?

Ans :

SCI: SCI means spg^{n} consistency index. It is calculated using the average fibre & yarn of five consecutive yarns of USDA annual crop reports. The SCI could be used as the first priority of the selection of bales. The main use of SCI in selecting bales is to gain the advantage that all major cotton properties have been selected in a controlled way. The eq^{n} used to calculate the SCI is as follows :

$$SCI = -414.67 + 2.9 \times \text{strength} - 9.32 \times \text{M.V.} + 49.17 \times \text{UHML} + 4.74 \times \text{UI} + 0.65 \times \text{Rd} + 0.36 \times (+b)$$

Where, UHML = Upper Half Mean Length in inches.
UI = Uniformity Index.
Rd = Reflectance degree.
(+b) = Yellowness of cotton fibre.

BIAS: BIAS means Bale Inventory Analysis system. It is developed by M/s Zellweger uster. According to this system mis is formed in a way that bales taken from stock are having min^{m} variation in quality parameters from bale to bale & from day to day.

Q. State the Major & Minor beating/cleaning points.

Ans :

Major cleaning points:

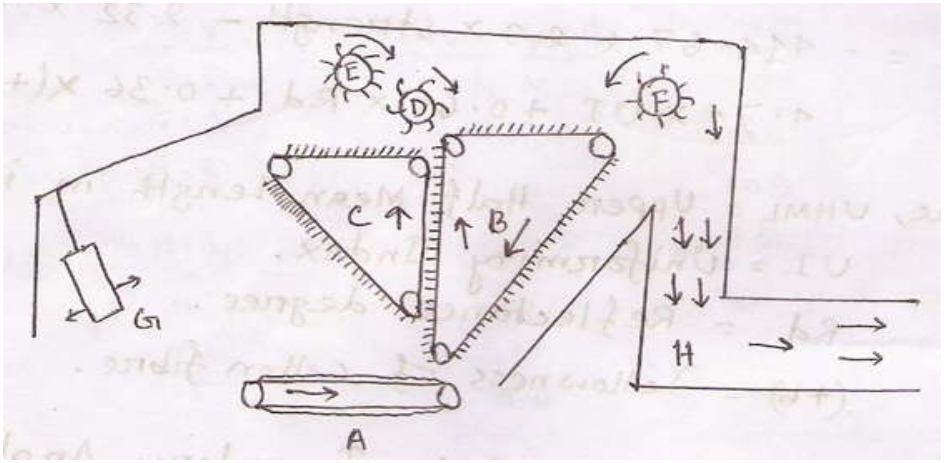
1. Step cleaner.
2. Porcupine beater.
3. Monocylinder.
4. Axi-flow cleaner.
5. Krishner beater.
6. Bladed beater.
7. ERM cleaner etc.

Minor cleaning points:

1. Bale plucker.
2. Bale opener.
3. Saw toothed beater.
4. De-dusting elements.
5. Condenser etc.

Q. Describe a Bale opener/breaker m.c with near sketch.
Noakhali Textile-`08.

Ans :



Here,

A = Feed lattice/Bottom lattice.
B = Vertical/inclined lattice.
C = Evener lattice.
D = Evener roller.
E = Wiper roller.
F = Delivery roller.
G = Swing door/Regulating plate.
H = Air + Mtl flow.

Objects:

1. To open the big jumps of cotton/feed mtls.
2. To faciliate the feeding of mtls to the next m/c.
3. To carry the mtls from one m/c to next m/c.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

Actions:

1. Action of spike lattice.
2. Action of air current.

Working Principle: Bale openers, blending openers, blending bale openers are manufactured by many companies. Bale opener/Bale breaker is equipped with bottom lattice, inclined spike lattice, evener roller, wipper roller of suction system. Its having also some essential accessories. Laying of mtl on the feed table is performed manually or by a bale opening m/c. The bottom lattice pushes the fibre mass towards the inclined lattice. Inclined lattice carry cotton with its spike towards the evener roller for facilitating the feeding. If these cotton lumps are sufficiently opened, they pass between the inclined lattice & the evener roller. However, most lumps are too large to pass through the space between the two units. They are thrown back into the blending hopper by the eve3ner roller & from the hopper they pass once more info the operating region of the two assemblies. Each time they become smaller until finally they can pass through to the next unit. Here evener roller as its name implies it control the amount of passage of cotton by opposite spike action. Wiper roller wipes the cotton to the surface of evener roller. Suction fan to the filter room collect the dust & dirt through pipeling. Blower fans are also activated for transferring the open cotton suitable for next m/c. This operation continue until m/c stoppage. Production rate & degree of opening are determined by the speed of operation of the inclined lattice & its spacing from the evener roller.

Setting & their effects:

i) Vertical lattice & evener lattice

wider → More mtl passage & less opening.

closer → Less mtl passage & more opening.

ii) Vertical lattice to evener roller.

wider → Less opening & higher production.

closer → More opening & less production.

iii) Vertical lattice & delivery roller.

wider → Higher production.

closer → Less production.

Q. Which m/cs are used for coarse & fine cleaning.

Ans :

For coarse cleaning:

1. Step cleaner/Ultra cleaner/Super cleaner.
2. The dual roller cleaner/Axiflow cleaner.
3. The monocylinder cleaner.

For Fine cleaning:

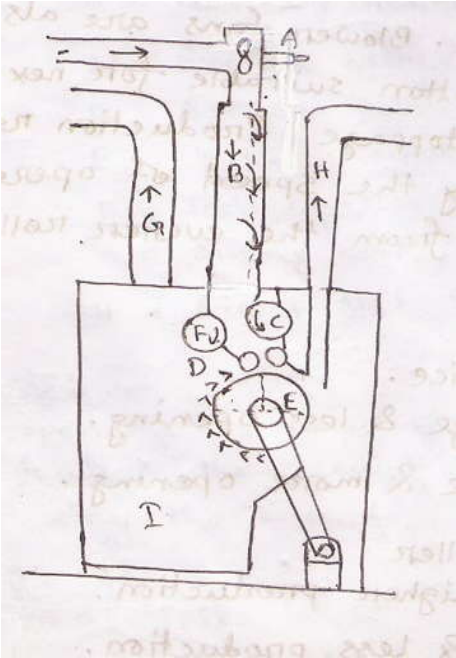
1. RN cleaner.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

2. E.R. cleaner.

Q. Describe efficient Raw Mtl (ERM) cleaner for fine cotton.

Ans :



Here,
A = Fan
B = Mtl filling chute.
C = Condensing roller/ Perforated roller/ Filter drum.
D = Feed roller.
E = Cleaning beater/roller.
F = Blind drum.
G = Excess air flow/duct.
H = Mtl outlet
I = Waste box.

Objects:

1. To open the fibres to a small tuft.
2. To beat the mtls finally.
3. To separate teh mtls from fine dust & trash..

Basic actions:

1. Action of beater/roller.
2. Action of grid bars.

Working principle: A fan (A) draws the flocks by suction from the preceding m/c & ejects them into a filling chute (B). The rear wall of the chute consists of individual aluminium lamellae with slot-openings through which the air escape. The raw mtl remains in the chute, is condensed & is fed to the opening roller by means of perforated roller (C) & blind drum (F) & the feed roller pair (D). The opening roller is exchangeable & can be fitted with bladed discs or a saw toothed clothing. The grid arranged under the roller consists of eight blades. After the grid, the flocks are removed by suction. The transport air of the fan (A) escapes via the slotted chute, filter drums & ducts (G).

M/c parameters:

working width → 100mm.
Beater diameter → 400mm

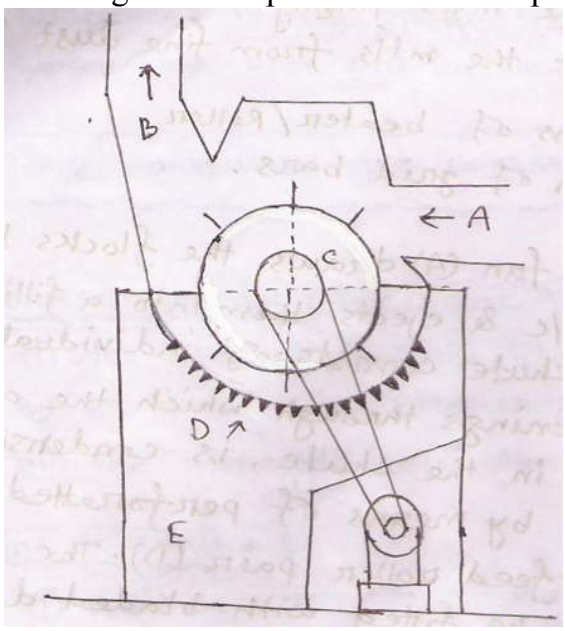
PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

Speed → 1000r.p.m.
Output → Max^{m} 500kg/hr.

Q. Describe the mono cylinder cleaner of Reiter for low quality cotton with near sketch.

Ans :

This is a loose feeding pin opener. Monocylinder cleaner is employed in the blowing room process between the mixing bale opener & Automixer. The advantage of this opener is that the impurities are separated without being crushed.



Here,
A = Entry pipe
B = Exit pipe
C = spike roller
D = Adjustable grid
E = Waste chamber.

Objects:

1. To separate the impurities from cotton flocks without being crushed.
2. To give the cotton flocks a strong cleaning.

Working principle: The cotton tuft is well opened by the bale openers & enter the m/c at right angle to the cylinder axis. The m/c operates in a similar manner to the dual roller cleaner but has only one drum/cylinder/roller. The mtl enters m/c at one side & streams through to the other side. In order to prevent flocks being drawn straight through the m/c, the large hood is divided into three chambers by guide plates. This causes the flocks to fall back into the region of the beater drum after being hurled out by the roller. In this way, i.e. is to pass three times over the grid, this gives a strong cleaning effect. The grid is in two parts & these are separately adjusted.

M/c parameters:

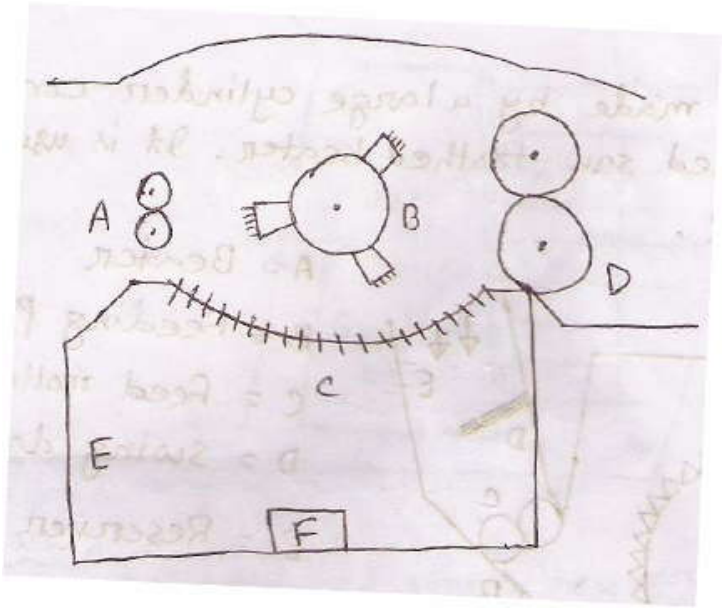
a) No. of beater drum → One.
b) Diameter of drum with spikes → 700mm.
c) Production → 500-800 kg/hr.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

d) Speed → 700r.p.m.
e) Width of the m/c → 1500mm.

Q. Describe the working principle of Krishner beater.

Ans :



A = Spring loaded feed roller.
B = Beater.
C = Grid bar.
D = Condensing cage.
E = Trash chamber.
F = Flap.

Object:

1. To open the fibres lumps to individual state as much as possible.
2. To clean the cotton/fibres with fine action.

Basic Action:

1. Action of bear (High speed beating).
2. Action of fan.

Working Principle:

Raw mtls are feed to the Krischner beater through shed feed system & flutted feed rollers. Beaters high speed causing the lumps of mtls to little and separate the trash finally. With the action of suction fan, mtls are carried to next m/c and separated trash, dusts falls to the dust chamber through grid bars. It is the m/c applicable equally for processing all sorts of raw mtls irrespevtive of natural artificial fibres. Setting between beater to grid bars & speed of the beater govern the trash removal percent.

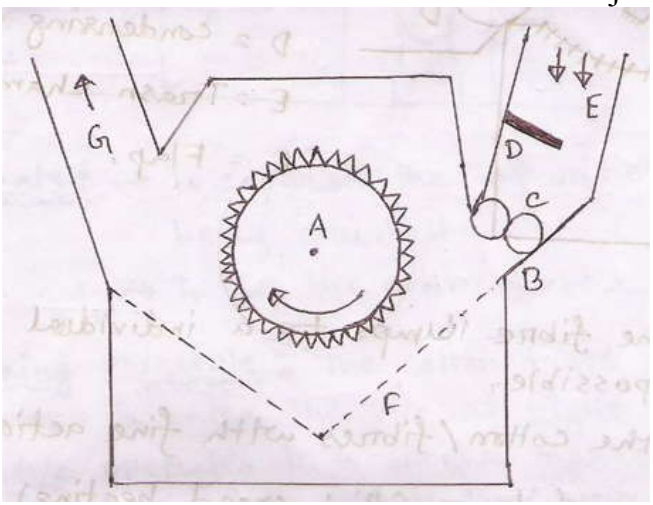
M/c parameters:

1. Working width: 1200mm.
2. Beater diameter: 406 mm.
3. Speed of beater: 820rpm.

Q. Describe Saw-toothed beater with near sketch.

Ans :

The beater which is made by a large cylinder contains tooth like saw tooth is called saw-toothed beater. It is used as a major cleaning point in B/R.



A = Beater.
B = Feeding plate.
C = Feed roller.
D = Swing door.
E = Reserver
F = Delivery case.
G = Delivery end.

Object:

1. To open the fibres from the cotton tuft.
2. To separate the fibres and
3. To remove the trash from the cotton.

Working Process:

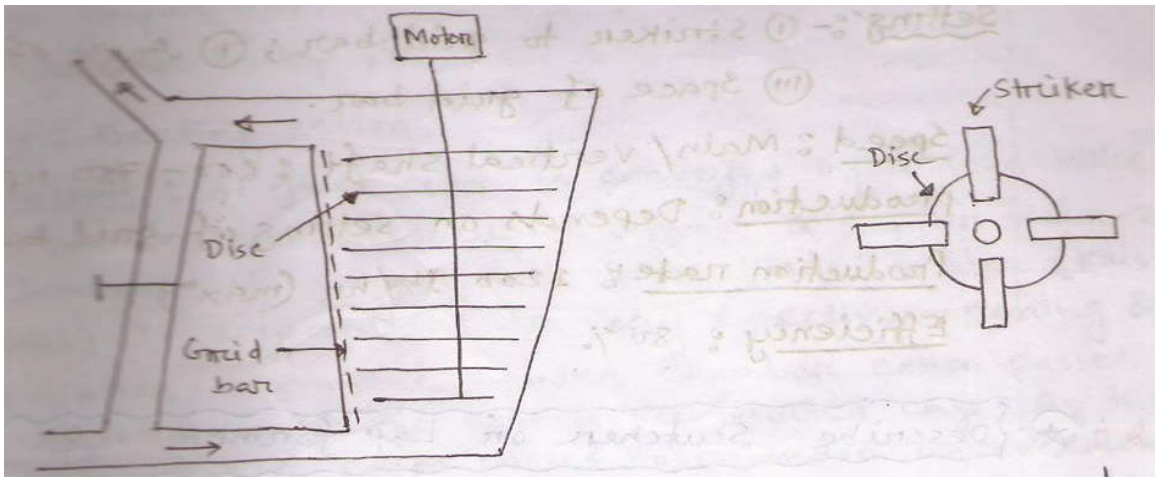
Cotton fibres are collected in the reserve box from the previous m/c which are feeded equally by the feed roller in the m/c. Cotton fibres comes in touch of saw toothed roller, strikes the cotton fibre. Saw toothed beater push the cotton to the case, where it is passing between saw-toothed beater & the case, so the fibres have been extracted & the wastage are fall below the undercase. Cotton fibre cleaned by this m/c are delivered to the next m/c by air flow.

Uses:

1. To process lower graded cotton fibre.
2. To remove the impurities from highly trash cotton.

Q. Describe Twine/Vertical/Crighton opener.

Ans :



Feature:

1. Cotton are striked when they are going with air current.
2. High quality opening & cleaning is done in this m/c.
3. Heavy impurities can pass through the grid, for sufficient spacing in the grid bar.

Actions:

1. Beating action.
2. Air current action.

Working principle:

In this m/c, when two vertical opener's are situate parallel to each other, then it is called twine opener. When the staple length of cotton is greater than $1\frac{1}{8}''$ then 33 striker attached with 8 dics, which are used. And when staple length is lower than $1\frac{1}{8}''$ then 34 striker attached with 6 dics, which are used. This m/c contains strong shaft.

Now-a-days main shaft is moving up & down by using foot step bearing. Main shaft contains 6-8 discs & each disc contains 33-34 strikers in different angle. To increase production & cleaning efficiency, shaft is bring down. By the help of air, fibres are entered inside it through the lower pipe. Strikers separate the fibre tuft or fibre by thrusting them with the grid bar by rotating in high speed & trash particles are get outside through the grid bar. Fibres rotates in high speed & finally issued through the delivery pipe in more clean & open form.

Setting:

1. Striker to grid bar.
2. Angle of striker.
3. Space of grid bar.

Speed:

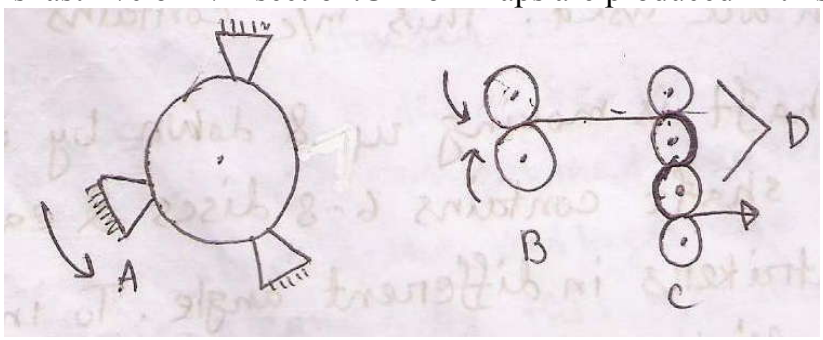
Main/vertical shaft : 600-750 rpm

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

Production:
Depends on setting of grid bar & speed of fan
Production rate:
1200 lb/hr.(maximum)
Efficiency:
80%

Q. Describe Scutcher or Lap former m/c.

Ans :
Scutcher: Scutcher is an unit to form lap sheet from the open & clean raw mtls to facilitate the feeding to the next processing i.e. in carding. On the other hand, it is also known as lap former unit. But scutcher does not work individually. It works in conjunction with other beater say, K.B, B.B with condenser etc. Scutcher is designed with some steel polished rollers fabricated one over another. They creates certain pressure to the mtl processed & form a sheet of definite density depending on the raw mtl characteristics. The rollers are known as calender rollers from which bottom can lender roller is responsible for delivery i. e. production. It is last m/c of B/R section.Uniform laps are produced in this m/c.



A = Krischner beater.
B = Condensing cage
C = Bottom calender roller.
D = Calender roller.

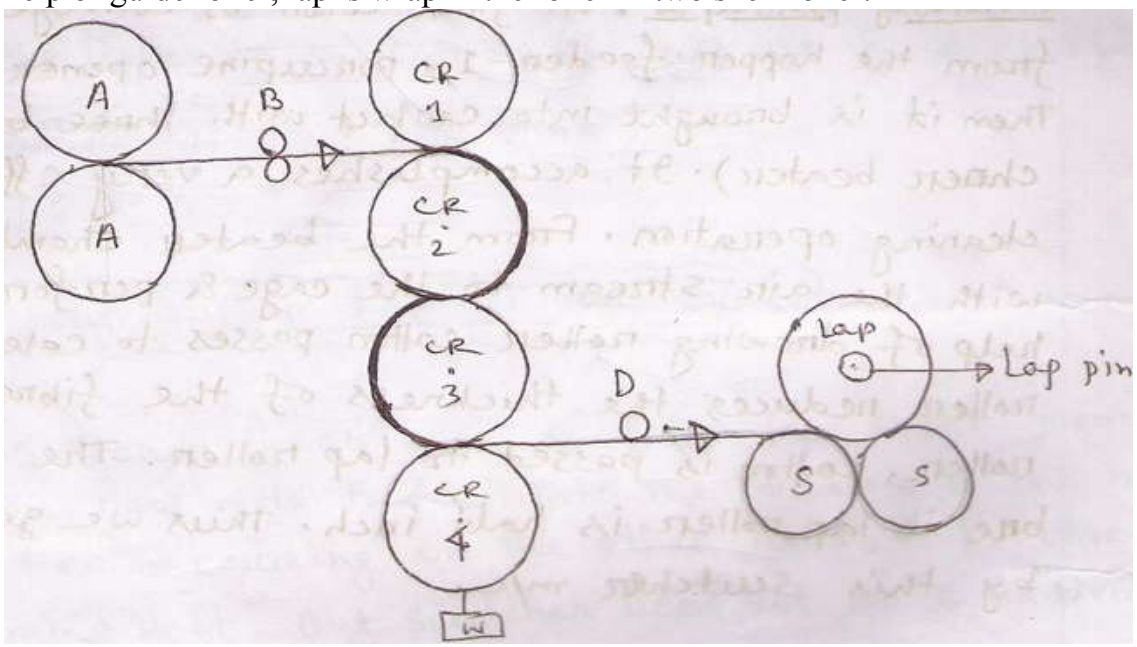
Object :
1. To produce even lap of predetermined length & width.
2. Finally individualization of fibre or small tuft.
3. To remove impurities.
4. To wrap the lap on lap pin.

Basic function : Beating action.
Working Principle : At first cotton is conveyed by a feed lattice from the hopper feeder-1, porcupine opener &hopper feeder-2. Then it is brought into contact with three bladed beater (Krichner beater). It accomplishes a very effective opening & cleaning operation. From the beater chamber cotton passes with the air steam to the cage & perforated cage. By the help of drawing roller cotton passes to calender roller. Calender roller reduces the thickness of the fibre. From the calender roller, cotton is passed to lap roller. The thickness of the fibre in lap roller is half inch. Thus we get cotton in lap form by this scutcher m/c.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

Parameters :
Bottom calender roller ida → 9”
Working width → 40” [Exact to the woeking width of carding engine].
RPM of callender roller → 7-12
Lap weight → 35/40/50/60 lbs etc.
Lap length → 40/50 yds etc.
Changeable matter → D.C.P (Draft change pinion)
→ Lap length wheel.

Lap formation : In scutcher m/c, cotton which are coming from beater are collected in case A & collected cottons are likely pressed by a calender rollers. In conventional m/c, Calender rollers are pressed by backet, weight & liver. But in modern m/c they are kept heavily weighted by air or pneumatic action. Cotton passed through the top & 2nd roller, then 3rd & Bottom Calender roller. Then by the help of guide roller, lap is wrap in the roller in two shell roller.



Here, A = cage, D = Dead preasure.
B = flutted delivery roller S =Shell roller
C.R = Calender roller W = weight.

Q. Write down some devices which are used in feed regulation motion.

Ans : The following devices are used in feed regulation motion. these are used for controlling feed mtl –
Swing paddle : Swing paddle is used in Bale process.
Swing door : It is used in Hopper feeder & acts as feed regulating.
Paddle lever : It is used in porcupine beater for feed regulating
Piano feed regulator : It is used in scutcher for feed regulating.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by ‘**www.bdtextileinfo.blogspot.com**’

Q. Write down a note on 'Regulating Motion'

Ans:

Regulating motion: Regulating action is responsible for maintaining a constant flow of cotton through each m/c & controlling over the regularity of the mtl throughout the whole process.

The correct amount of cotton in the reserve box may be maintained by using –

1. Swing door.
2. Photoelectric cell.
3. Measuring pressure.
4. Piano feed regulating system.
5. Reserve box.
6. Micro switch.

Importance:

1. To produce not only uniformed lap but also uniformed sliver.
2. This motion is important in the B/R in order to maintain a constant flow of cotton.
3. For uniform feeding.
4. To remove dust, dirt & short fibres as req^{d}, this motion needed.
5. To maintain the desired characteristics of lap.
6. To get optimum efficiency of m/c in the B/R.

Q. Describe about regulation action present in B/R.

Ans:

The following regulating action is present in modern B/R.

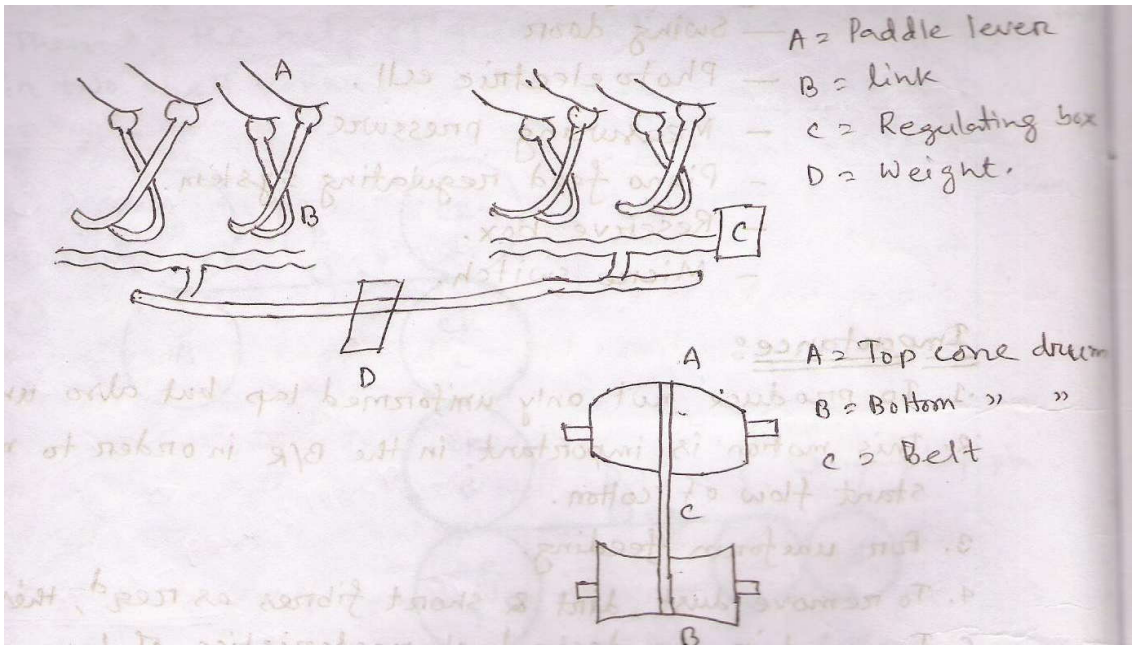
1. By photoelectric cell: Here the light source & photocell are filted opposite a window in each side of the m/c so that the light passes through on to the m/c. While filling the cotton if the light is broken between light source & photo-cell, the feed of cotton is stopped until cotton again moves away from the light source.

2. By piano feed regulating system:

Object:

1. To feed the layer/wave of fibre uniformly to switcher.
2. To control feed by decreasing the speed of feed roller in case of thick places of cotton & by increasing the thin place.
3. To produce uniform lap.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch



Principle: The pedal movement caused by the thick & thin places of cotton is employed to shift the belt in the cone drums by means of lever to alter the speed of the feed roller in order to keep the feed contains per unit time.

3. By air pressure: When air & cotton are fed, air is sucked by another portion, this air pressure is measured by sensor & is used to determine the amount of cotton present in the hoppers. If pressure is more, it stops feeding & if pressure is less, it allows more cotton to enter.

4. By swing door: The arrangement of swing door is such that when the hopper is about $\frac{2}{3}$ to $\frac{3}{4}$ full of cotton, it is forced down against the resistance of the counter balance spring, then the drive to feed lattice is stopped. The swing door is used for the uniform feeding of cotton to spiked lattice.

Q. Write the causes of lap wt. variation.

Ans :

1. Unsuitable feeding :

a) Irregular feeding of fibres to the feed lattice by the feeders in the bale opener.

b) Feed of very large piece of baled cotton.

2. Characteristics of fibre in blending :

a) If the blend contains improper mixing of fibre it may be varying fineness.

b) If there are immature fibres in the blend, irregular lap are produced.

c) If there are weak & short fibres, produce irregular lap.

3. Incorrect setting of different m/c parts :

i) **Mechanical swing door or photoelectric cell :** Lap variation will produce due to setting faults in this instrument.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

ii) **Setting of evener roller :** If this setting is incorrect, the opening regularity of flow of fibre & rate of production of the m/c is affected with causes lap irregularity.
iii) **Piano or cone drum regulating arrangement :** If this system does not work effectively, causes lap variation.
4. Improper maintenance of the machinery : Due to not well maintained proper opening, beating, cleaning, disposal of dust, control of air current, fan speed etc leads to lap variation.
5. Excessive waste content in lap.
6. Incorrect fan speed : If fan speed is too slow, the fibres move on the cages. on the other hand, if the fan speed/air flow is too strong, the cotton is drawn downwards the centre of the cages & will give a barrel shaped lap.

Q. Discuss the defects & their remedies of lap due to faulty setting of m/cs in B/R.

Ans :
1. Uneven lap : Patchy, sticky, thick & thin places in lap.
Causes : i. Uneven feed of mtl.
ii. Faulty regulating motion.
iii. Improper m/c maintenance.
Remedies : i. To ensure even feed of mtl.
ii. Correct bale opening.
iii. Proper m/x maintenance.
2. Irregular lap : Lap should be definite shape, length & wt/unit length. If the lap is less than the required length them then it is called Irregular lap.
Causes : i. Uneven feed of fibre to feed lattice.
ii) Presence of weak, small & immature fibres in fibres during mixing.
iii) Faulty regulating motion, cage, swing door.
iv) Improper m/c maintainance.
3. Soft lap : If the lap is less compact, it is called soft lap.
Causes : i. Low pressure of calender roller.
ii. Less relative humidity.
iii. More trash content of fibre.
Remedies : i. Presence of calender roller should be controlled.
ii. Relative humidity should be controlled.
iii. Cleaning should be correct.
4. Conical lap : If the width of lap increases or decreases with respect to its initial width, the lap is called conical lap.
Causes : i. Air suction varies due to fan speed variation. So, uneven drawn of mtl at both sides of cage.
ii. Pressure variation at both sides of calender roller.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

iii. Dirt drain in one side of cage.
iv. More air inlet at one side.

Remedies : i. To ensure proper air flow.
ii. Calender roller pressure must be controlled.
iii. After a certain time, cage must be cleaned.

5. Barrel shaped lap : If the thickness of lap in middle is more than that of at the border sides it is called Barrel shaped lap.

Causes : i. More air suction in the middle position of the cage due to excessive fan speed & so more fibre is drawn in the middle position of cage.
ii) Due to accumulation of dirt at both sides of the cage.

Remedies : i) Fan speed should be controlled.
ii) After certain time, cage must be cleaned.

6. Licking lap : Not uniform all over the lap area.

Causes : i) Low pressure of calender roller.
ii) Excessive fan speed.
iii) Improper roller motion setting.
iv) Low opening of cotton.

Remedies : i) Proper fan speed
ii) Proper pressure of calender roller.
ii) Proper opening of cotton.

7. Defective selvedge : Both sides of lap are uneven.

Causes : i) Waste accumulation at m/c sides
ii) Waste accumulation at grid bars & cage sides
iii) Broken gear teeth or m/c parts.
iv) Faulty cage & faulty surface of lattice.

Remedies : Proper maintenance of cage & lattice.

8. Split lap ; The cotton splits into sheet like a sandwich when unrolling at the card

Causes ; i) Low pressure of calender roller.
ii) Low temp in B/R section.
iii) Variation of surface speed of top & bottom cage.

Remedies : i) Proper pressure of Calender roller.
ii) Proper temp in B/R.

9. Dirty lap :

Causes : i) Insufficient dirt removal.
ii) Dirty m/c due to improper maintenance.

Q. Mention the std. lap specification.(Approximately)

Ans :
Lap length → 60 yds.
Lap weight → 40-50 lbs.

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

Lap wt/yd → 12 to 16 oz -1lb
Lap wt. variation → 3%(acceptable.)
Lap hank/count → 0.0012-0.0018
Lap width → 40-42 inch.
Mechanical draft → 2.5-4
Relative humidity → 55%
Efficiency →70-80%

Q. Distinguish bet^{n} Crighton opener & Porcupine opener.

Ans :

Sl. no	**Crighton opener**	**Porcupine opener**
1.	It is used in the middle of B/R line.	It is used in the beginning or end of B/R line.
2.	Beater speed 600-750 rpm.	Beater speed 750-800 rpm.
3.	Generally it is used fro lower graded & short staple cotton, but sometimes it is used for long staple cotton with high trash content.	It is used for all graded cotton.
4.	Easily removable trashes are removed here.	Hardly removable trashes are removed here.
5.	Efficiency is 80%	Efficiency is 20-25%
6.	Only beating action is applied.	Beating & opening action used.

Q. Describe By-pass system with near sketch. Noakhali Textile-`08,`09.

Ans :

The process by which the fibres are passed through a pipe to the next m/c or beating point by air flow without using a m/c or beating point is called By-pass system.

Working Principle : This system is used for medium or high grade of cotton. When the fibre is or medium grade, we can restrict a m/c or beating point. There is a pipe between the previous m/c & the next m/c. We should off the door of the m/c which we want to restrict. If the fibre is of fine grade, we can restrict another m/c or beating point by the same way.

Advantage :

1. Cotton can be process in the same B/R according to their grade.
2. Cotton processing cost is lower.
3. Wastage reduce.
4. Higher graded products are produced.

Q. Short note on – Air Flow system.

Ans:

Object:

1. To transfer the cotton fibres.
2. To remove foreign mtl from cotton fibres.

Q. Mention the std. lap specification.(Approximately)

Ans:

1. **Slotted sheets & perforated sheets:** Both are formerly placed under cards & used to a steady decreasing extent.
2. **Triangular section bars:** These are robust east to maintain & give a good cleaning effect.
3. **Angled bars:** These are somewhat less robust & can tend to create blockages.
4. **Blades:** Blades have been used as grid elements for a long time, almost always in combination with triangular.

Mathematical Problem

* 1 lb = 16 ounce = 7000 grain = 453.6 gm.
* 1 Metric ton = 2204 lb.
* 1 kg = 2.2046 lb.

Q. A lap contains 2% trash after processed in B/R having the cleaning efficiency of 80%. Find the trash % in raw cotton. Noakhali Textile-`08.

Ans :

We know,

$$\text{Cleaning efficiency} = \frac{\text{Trash remains after processing}}{\text{Total trash}}$$

$$\Rightarrow 80 = \frac{2\%}{\text{Total Trash}}$$

$$\Rightarrow \text{Total Trash} = \frac{2}{80} \times 100$$

$$\Rightarrow \text{Total Trash} = 2.5\%. \text{ (Ans.)}$$

Q. Bottom calender roller dia = 7 inch, rpm = 10 & wt. of every yds lap is 12 oz and cleaning efficiency 75%. Find out the production of B/R per hour.

Ans :

$$\text{Production/hr of B/R} = \frac{3.14 \times 7 \times 10 \times 60 \times 75 \times 12}{36 \times 16 \times 100} \text{ lb}$$

$$= 206.06 \text{ lb (Ans.)}$$

Q. If lap length const is 720, then set the change pinion for 40 yds lap.

Ans :

$$\text{Change pinion} = \frac{\text{lap length constant}}{\text{lap length}}$$

$$= \frac{720}{40}$$

$$= 18 \text{ T (Ans)}$$

Q. If lap wt. is 15 oz per yds, find the hank.

Ans :

$$\text{Hank} = \frac{1 \text{ yds} \times 16 \text{ ounce}}{840 \text{ yds} \times 15 \text{ ounce}} = 0.0012 \text{ hank.}$$

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

Q. If lap wt. is 15 oz/m. Find the Hank.

Ans :

$$\text{Hank} = \frac{1\,\text{m} \times 16\,\text{oz}}{840\,\text{yds} \times 15\,\text{oz}} = \frac{1.1\,\text{yds} \times 16\,\text{oz}}{840\,\text{yds} \times 15\,\text{oz}} = 0.00139\,\text{hank.}$$

Q. If lap wt. – (i) 15 lb/yds, (ii) 15 lb/m, (iii) 15 grain/yds, (iv) 15gt/m, (v) 15gm/yd, (vi) 15gm/m. Find the hank.

Ans :

(i) $\text{Hank} = \frac{1\,\text{yds} \times 16\,\text{lb}}{840\,\text{yds} \times 15\,\text{lb}} = 0.0000793\,\text{hank. (Ans)}$

(ii) $\text{Hank} = \frac{1\,\text{m} \times 1\,\text{lb}}{840\,\text{yds} \times 15\,\text{lb}} = \frac{1.1\,\text{yds} \times 1\,\text{lb}}{840\,\text{yds} \times 15\,\text{lb}} = 0.0000873\,\text{(Ans)}$

(iii) $\text{Hank} \frac{1\,\text{yds} \times 7000\,\text{grain}}{840\,\text{yds} \times 15\,\text{grain}} = 0.55\ \text{(Ans)}$

(iv) $\text{Hank} = \frac{1\,\text{m} \times 7000\,\text{gr}}{840\,\text{yds} \times 15\,\text{gr}} = \frac{1.1 \times 7000}{840 \times 15} = 0.611\ \text{(Ans).}$

(v) $\text{Hank} = \frac{1\,\text{yds} \times 453.6\,\text{gm}}{840\,\text{yds} \times 15\,\text{gm}} = 0.036.\,\text{(Ans)}$

(vi) $\text{Hank} = \frac{1\,\text{m} \times 453.6\,\text{gm}}{840\,\text{yds} \times 15\,\text{gm}} = \frac{1.1 \times 453.6}{840 \times 15} = 0.0396.\,\text{(Ans)}$

Q. Find the no. of lap per hour in scutcher m/c of Bottom calender roller dia = 7 inch, rpm = 12, efficiency 80%. Lap length 40 yds.

Ans :

$$\text{Production of m/c} = \frac{\pi \times 7 \times 12 \times 80 \times 60}{36 \times 100}\,\text{yds}$$

$$= 351.85\,\text{yds.}$$

$$\text{No. of lap} = \frac{351.85}{40} = 8.79 \approx 9\,\text{(Ans.)}$$

Q. Find the no. of lap per hour in scutcher m/c of Bottom calender roller dia = 7 inch, rpm = 12, efficiency 80%, lap wt. 14 oz/yds.

Ans :

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch

$$\text{Production} = \frac{3.14 \times 7 \times 12 \times 0.80 \times 60 \times 8 \times 14}{36 \times 16} \text{ lbs}$$
$$= 2461.76 \text{ lbs}$$
$$= \frac{2461.76}{2204} \text{ metric ton}$$
$$= 1.117 \text{ metric ton. (Ans)}$$

Q. If in a xsutcher m/c, rpm of B.C.R. is 10, dia 7 inch, lap wt. 12 oz/yd. Find the production/hr at 90% efficiency. Dhaka Textile-`04.

Ans :

$$\text{Production} = \frac{3.14 \times 7 \times 10 \times 12 \times 60 \times 90}{36 \times 16 \times 100} \text{ lbs}$$
$$= 2461.76 \text{ lbs. (Ans)}$$

Q. Production of B/R line with 2 scutchers if B.C.R. dia = 7 inch, rpm = 10, Efficiency 90%, wastes 4%, lap wt. 14oz/yd. Dhaka Textile-`03

Ans :

$$\text{Production} = \frac{3.14 \times 7 \times 10 \times 1 \times 60 \times 90 \times (100 - 4) \times 2 \times 14}{36 \times 16 \times 100 \times 100} \text{ lbs}$$
$$= 553.896 \text{ lbs. (Ans)}$$

Q. Calculate production/he of a B/R line if, r.p.m. of B.C.R. = 14, Dis = 18 cm,, lap hank = 0.0012, efficiency 80%, no. of scutcher = 2. Dhaka Textile-`05,`06.

Ans :

$$\text{Production} = \frac{3.14 \times 18 \times 14 \times 60 \times 0.80 \times 2}{36 \times 2.546 \times 840 \times 0.0012} \text{ lbs}$$
$$= 822.2 \text{ lbs. (Ans)}$$

Q. Find the B/R cleaning efficiency, if waste in Raw cotton = 6%, waste in sliver = 0.4%. Carding, cleaning efficiency 75%.

Ans :

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch
Get this by '**www.bdtextileinfo.blogspot.com**'

$$\text{Carding cleaning efficiency} = \frac{\text{waste in lap - waste in sliver}}{\text{waste in lap}} \times 100$$

$$\Rightarrow 75 = \frac{x - 0.4}{x} \times 100$$

$$\Rightarrow x = 1.6\%.$$

$$\therefore \text{B/R cleaning efficiency} = \frac{6 - 1.6}{6} \times 100 = 73\% \text{ (Ans.)}$$

Q. The trash control of feed cotton is 3%. After passing the beater 2% waste is extracted, of which 15% is good fibre, what is the cleaning efficiency of the beater? Dhaka Textile-`06.

Ans :

Of the 2% waste extraction, $\frac{100 - 15}{100} \times 2 = 1.7\%$ of the original trash has been taken out by beater.

$\therefore$ (3-1.7) = 1.3% trash remain in the mtls, which is delivered from the beater.

$$\therefore \text{C. efficiency} = \frac{\text{Original T.C - T.C. in delivered cotton}}{\text{Original T.C.}} \times 100$$

$$= \frac{3 - 1.3}{3} \times 100$$

$$= 56.66\% \text{ (Ans.)}$$

Q. Find out beats/inch from the following data-
Beater r.p.m. = 720, no. of striker = 16, Feed roller r.p.m. = 24, Dia of feed roller = 3 inch. Dhaka Textile-`02.

Ans :

$$\text{Beats/min} = \text{Beater r.p.m.} \times \text{no. of striker}$$

$$= 720 \times 16 \text{ no.s}$$

$$= 11520 \text{ no.s}$$

$$\text{Surface speed of feed roller} = \pi DN$$

$$= 3.14 \times 3 \times 24$$

$$= 226.08$$

$$= \frac{\text{Beats/min}}{\text{surface speed of feed roller}}$$

$$\therefore \text{Beats/inch} = \frac{11520}{226.80}$$

$$= 50.96 \text{ (Ans.)}$$

Q. The trash content of a cotton as fed to Beater 3.6%. The waste

extraction is 1.5% of which 80% is trash. What is the cleaning efficiency of the beater? Dhaka Textile-`04,`05,`07.

Ans :

Of the 1.5% waste extraction, $\frac{80}{100} \times 1.5 = 1.2\%$ of the original trash has been taken out by beater.

$\therefore$ (3.6--1.2) = 2.4% trash remains in the mtls, which is delivered from the beater.

$$\therefore \text{C. efficiency} = \frac{\text{Original T.C - T.C. in delivered cotton}}{\text{Original T.C.}} \times 100$$

$$= \frac{3.6 - 2.4}{3.6} \times 100$$

$$= 33.3\% \text{ (Ans.)}$$

PREPARED BY :
Abdullah Nur Uddin Rony & Khurshedul Alam
BTEC, 2ND Batch