B.TECH. (TT) III SEMESTER

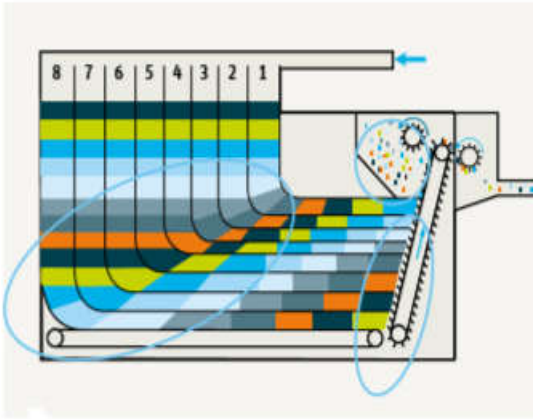
SUBJECT – YM I

MODEL QUESTION PAPER WITH ANSWER KEY

MID TERM I

1. Write a note on Unimix with a neat diagram.

The Rieter B 70 UNImix

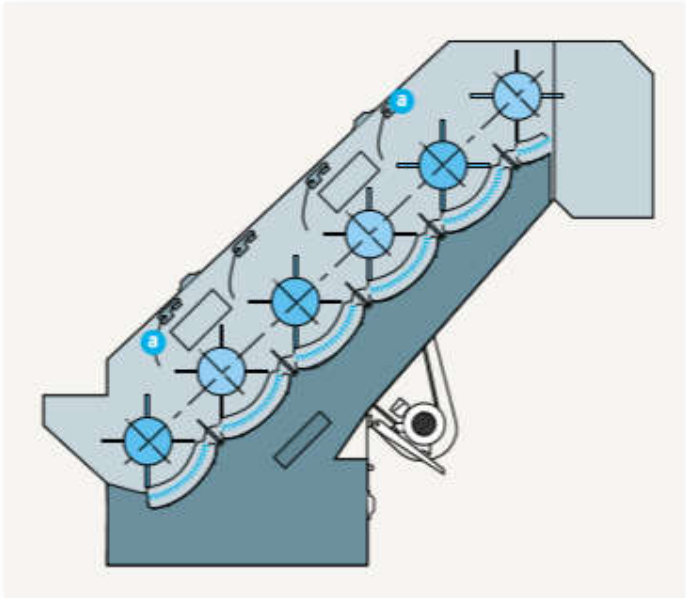


The machine (Fig. 52, Fig. 53) is made up of three parts: a storage section, an intermediate chamber and a delivery section. Tufts are fed pneumatically and simultaneously into eight chutes (Fig. 52, 2) arranged one behind the other in the storage section. A conveyor belt feeds the stock through the intermediate chamber to the spiked lattice (3). The material columns are thus diverted from the vertical into the horizontal. In addition to a condensing effect, this 90° deflection in the material flow also produces a shift in the timing and spatial distribution of the fiber packages from the first to the last chute. This special construction with a deflection of 90°, and thereby different distances from the individual chutes to the lattice (at chute 1: short distance; at chute 8: long distance) in turn results in good long-term blending. Thereafter, as in a blending opener, material is extracted from the intermediate chamber and subjected to a further opening step between an inclined spiked lattice (3) and an evener roller (4) (short-term blending). An optical sensor ensures that only a small quantity of fiber stock is held in the mixing chamber in front of the lattice (3). Behind the spiked lattice there is a take-off roller and a simple pneumatic suction feed to the next machine.

2. Discuss the working principle of Step cleaner.

The step cleaner

The material falls into the feed hopper and passes to the first beater. From there it is transported upward by the six (sometimes three or four) beater rollers, each carrying profiled bars; the beaters are arranged on a line inclined upward at 45°. Elimination of impurities takes place during the continual passage of the material over the grids arranged under the rollers (Fig. 46).
Some step cleaners have a high flow chamber with special baffle plates (a) to improve cleaning intensity. The grids are always adjustable and usually also the beater speed.



3. Which factors affect the degree of opening and cleaning

General factors which affect the degree of opening , cleaning and fibre loss are,

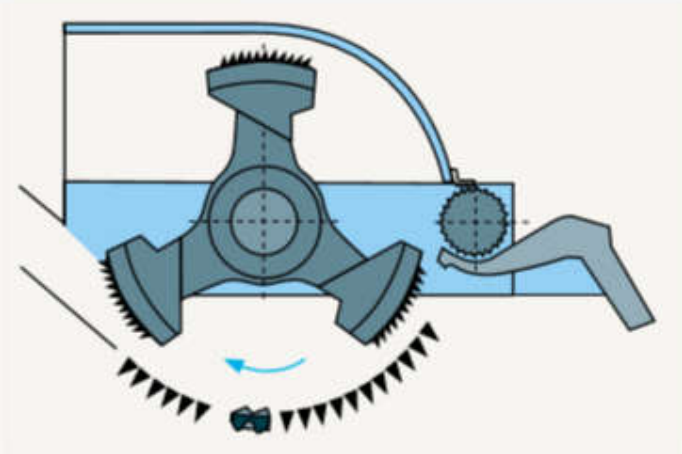
thickness of the feed web
density of the feed web
fibre coherence
fibre alignment
size of the flocks in the feed (flock size may be same but density is different)
the type of opening device
speed of the opening device
degree of penetration
type of feed (loose or clamped)
distance between feed and opening device
type of opening device
type of clothing
point density of clothing
arrangement of pins, needles, teeth
speeds of the opening devices
throughput speed of material
type of grid bars
area of the grid surface
grid settings
airflow through the grid
condition of pre-opening
quantity of material processed,
position of the machine in the machine sequence
feeding quantity variation to the beater
ambient R.H.%
ambient temperature

MID TERM II

1. Write a note on Kirschner beater.

Beaters and rollers with pinned bars

These machines are similar to the multiple bladed beaters, but instead of beater bars, pinned bars (pinned lags) are secured to the ends of the cast-iron arms. They were called Kirschner beaters and comb through the web at speeds of 800 - 900 rpm. The relatively high degree of penetration results in good opening. Kirschner beaters were therefore often used at the last opening position in the blowroom line, since good pre-opening of the fiber material permits gentle opening at the licker-in of the card. The cleaning efficiency of the Kirschner beater is high, but unfortunately, so too is fiber elimination. Some machinery manufacturers therefore replaced the grid under the Kirschner beater with a guide plate; the resulting machine was an opener, but no longer a cleaner.



2. Discuss various types of lap defects with their causes.

The types of lap defects commonly encountered and their likely causes are as follows:

Ragged Lap selvedges
Causes

- Waste accumulation at the sides of the grid bars, cages or calender rollers, obstructing smooth flow of material.
- Torn leather linings of cages.
- Rough spot at the sides of the feed plate delivering the material to the calender rollers.
- Improper setting of selvedge guides.

Lap licking

Causes

- Use of too much soft waste in the mixing.
- Too high fan speed.

- Excessive beating.
- Insufficiently weight calender rollers.
- Too much weight on lap racks.
- Either cotton is damp or departmental humidity is high.
- Sticky nature of the material and type of spin finish in the case of polyester.

Remedies

- Use of roving ends to act as layer separators.
- Incorporation of lap filters.
- Blanking off of one of the cages.
- Use of antistatic spray while processing synthetics.
- Reduction of full lap weight.

Conical laps

Causes

- Improper functioning of pedals on one side to pedals being choked with dirt.
- Air entering at one side from under the grid bars of the beater.
- Defective beater blades at one side.
- Uneven suction at the cages leading to deposition of more material on one side than on the other.
- Lap spindle racks not exerting even pressure across the lap width.

Dirty laps

Causes

- Blunt grid bars or grid bars not properly set i.e. set either too close or at incorrect angle.
- Grid bar interspaces choked up.
- Excessive fan speed leading to ineffective cleaning.
- Blunt and slow running beaters.
- Beater set too far from feed roller or pedals.
- Trash boxes overfull, or air current in trash box region causing retrieval of trash.

Thick and thin places in lap or patchy laps

Causes

- Insufficient suction at the cages.
- Damaged cages i.e. damages wire meshing or worn-out flannel or leather linings.
- Insufficient opening of cotton lumps at the preceding machines.
- Improper removal of air from the cotton stack at the overflow box or reserve hopper feed box leading to the formation of air pockets.

Holes in lap

Causes

- Damages cages.
- Too high tension draft between shell roller and calender roller.

Soft laps

Causes

- Inadequate pressure at calender roller and lap rack.
- Too low tension draft between shell roller and calender roller.
- Worn out brake linings on brake pulley.

Stringiness of cotton tufts in lap

Causes

- Feeding of damp cotton.
- Cotton being over-beaten either due to high beater speed, choking of beater chamber or use too many beating points in the line.
- Excessive rolling action of material in machines like the step cleaner.

Lap splitting

Causes

- Cotton being blown equally on both the cages.

Remedies

- Increase calender roller pressure.
- Partially blank off one of the cages.

Disturbed tufts in laps

Causes

- Excessive speed of fluted lap rollers.
- Lap may be so large and bulky that it touches the plain calender rollers when it is getting built-up.
- Disturbance to tufts of the outer layer also occurs during storage and transportation.