

First Mid Term Test Session 2017-18

B TECH VII SEM TEXTILE TECHNOLOGY AND TEXTILE ENGINEERING

MODERN METHOD OF FABRIC PRODUCTION/ MODERN WEAVING MACHINE

QUESTION 1. Explain the following with neat sketch.

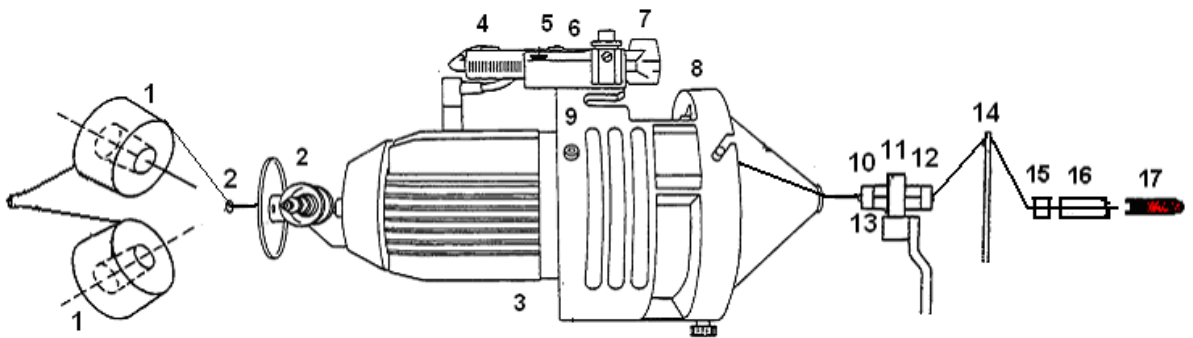
Weft supply system of Projectile weaving machine.

ANSWER-

Weft supply System of Projectile weaving machine: The weft insertion system of projectile weaving machine carries following system and mechanism:

- a. Weft supply system
- b. Colour selection mechanism
- c. Weft transfer mechanism
- d. Picking mechanism
- e. Weft insertion system
- f. Selvedge formation mechanism

a. Weft supply system



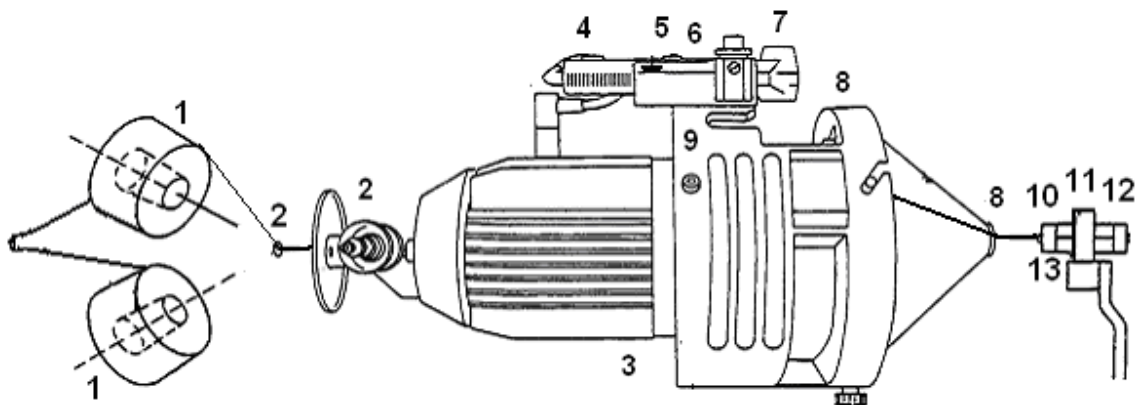
Conventional weft supply system of projectile weaving machine

1. Weft supply package
2. Preliminary weft brake (weft tensioner) and the shield
3. Accumulator
4. Potentiometer for winding rotor
5. ON/OFF switch
6. Potentiometer for photoelectric cell
7. Photoelectric cell light spot
8. Ring tensioner with eyelet arm
9. Winding disc and Silver plate/ web
10. Weft yarn eyelet
11. Brake shoe double
12. Electronic Weft Stop Motion
13. Brake band
14. Weft tensioner lever
15. Filling Tube
16. Projectile Feeder
17. Projectile

Weft supply package :- Bring accumulator stand for single, two or four-colour weaving machines to weaving machine and position in such a way that there is a clearance of 30-50 mm between the eyelet arm and the weft yarn eyes of the preliminary weft brake and the shield respectively. Adjust height of accumulator stand so that the weft yarn eyes of the eyelet arm line up with the weft yarn eyes of the preliminary weft brake and the shield respectively. Line up accumulator heads so that their axes point to the weft yarn eyes of the preliminary weft brake and the shield respectively. The accumulator heads are to be without content. Adjust package spindle so that they point exactly to the weft yarn eyes of the preliminary weft brake and the winding rotors respectively. Fix the weft supply packages on their respective package spindle and knot weft yarn last end of first package to starting end of weft yarn of second package, to make the weft package in magazine for continuous supply of weft yarn because of high production weaving machine.

Preliminary weft brake i.e. weft tensioner: A preliminary weft yarn brake is absolutely necessary for weft yarn accumulator without wobble cylinder. The intensity of the preliminary weft yarn brake should be set in such a way that the yarn winding on the accumulator drum are pushed slightly forward by those that follow. The individual yarn winding are not to be wound over by the subsequent winding or lie loose on the accumulator drum.

There are two types of weft yarn brake used. Firstly, preliminary weft yarn brake type IRO for 150 tex (Coarser than Nm 7.) is used by clamp vanes tight with screw so that they can not shift, but can still be set by hand. Secondly, preliminary weft yarn brake type Bettini for up to 150 tex (finer than Nm 7) is used by adjust the height of the plate axle so that the yarn weft yarn does not run out of the plates and that the latter only rotate slowly and not at great speed. The fitting of a weak brake spring is recommended for the processing of irregular yarns.



1. Weft supply package. 2. Preliminary weft brake (weft tensioner) and the shield
3. Accumulator 4. Potentiometer for winding rotor 5. ON/OFF switch
6. Potentiometer for photoelectric cell 7. Photoelectric cell light spot
8. Ring tensioner with eyelet arm 9. Winding disc and Silver plate/ web 10. Weft yarn eyelet 11. Brake shoe double 12. Electronic Weft Stop Motion 13. Brake band

Function of weft yarn accumulator The weft yarn accumulator, which is located between weft package and weft break of the weaving machine, draws the weft yarn at constant speed from the package and winds same in parallel windings onto a stationary, smooth accumulator winding drum. As a result of this, high draw-off resistance is excluded during intermittent draw-off of the weft yarn. With the aid of a potentiometer located on the photo electric cell, the winding speed can be sleeplessly adjusted to the weft insertion rate.

Potentiometer for winding rotor: Set potentiometer of winding rotor in such a way that the winding rotor does not stand still and the weft yarn reserve on the accumulator drum does not run out when the machine is initially starting position. The winding speed can be increased by turning the potentiometers in the clockwise direction.

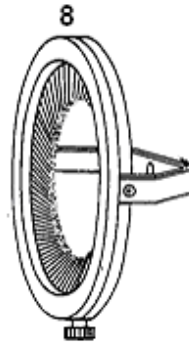
On/off switch of accumulator: The function of on/off switch is to operate the accumulator motor.

Potentiometer for Photoelectric cell switching point : Bring switch **on** position and turn potentiometer in an anti-clockwise direction until the red light diode extinguishes. Turn potentiometer slowly in a clockwise direction until the red light diode light up. The beam of light from photoelectric cell must fall on to the yarn winding drum. Turn potentiometer in clockwise direction until the red light diode lights up. Turn potentiometer slowly in anti-clockwise direction until the red light diode extinguishes.

Definition of the light diodes : The light diodes of the photoelectric cell operate in two colors as the Green light diode- only lights up if the switch is **on** position. Winding rotor rotates if beam of photoelectric cell is reflected. Red light diode- Light up independently of the position of switch, as long as the beam of the photoelectric cell is reflected.

Weft yarn reserve:-The supply of weft yarn on the accumulator drum with wobble cylinder should be equivalent to about 38 cm. long. In the case of accumulator drum without wobble cylinder the weft yarn reserve must be somewhat larger, so that the last wound on layer of weft yarn offer sufficient resistance and slide uniformly to the front. Bring switch of photoelectric cell to position "o", undo nut and displace photoelectric cell accordingly by means of adjustment screw. The light spot is not to fall onto the web at the end of the slot in the balloon break funnel. Remove all weft yarn windings from accumulator drum and bring switch to "I" Position. Check stored length of weft yarn. Switch on weaving machine and observe accumulator drum. The accumulator must start to wind, as soon as about $\frac{1}{3}$ to $\frac{1}{2}$ of the weft yarn reserve has been drawn off. The weft yarn reserve is to be adjusted when the weft yarn and weaving width are changed.

Ring tensioner :- The function of ring tensioner to control balloon formation and maintain the tension of the weft yarn during the weft insertion. The braking effect on the weft yarn can be adjusted through displacement of the ring tensioner in the tubular housing. Slacken off screw and displace ring tensioner in such a way that between two weft insertion phases then weft yarn is positioned loosely (but not sagging) between the accumulator drum and the weft brake of the weaving machine.

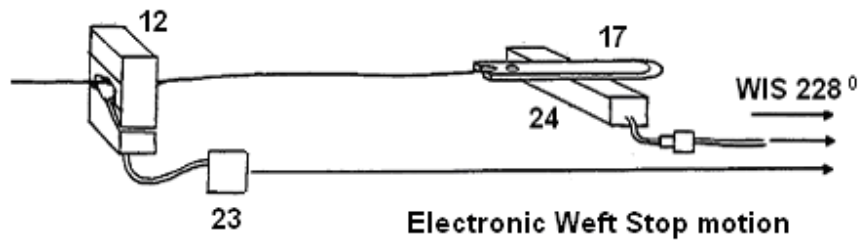


8. Ring Tensioner

Electronic weft stop motion: - The movement of the weft yarn generates a signal in the sensing head. This signal is transmitted by way of the amplifier box to the module in the control cabinet, where it is made visible by the lighting up by the diode (Sensing head). The monitoring period commences at 228° its final phase begins when the projectile passes over the flight trigger. At the beginning of the monitoring period, the diode (Control interval) light up for a short time. The diode of flight trigger light up for a short time when the projectile passes over the flight triggers.

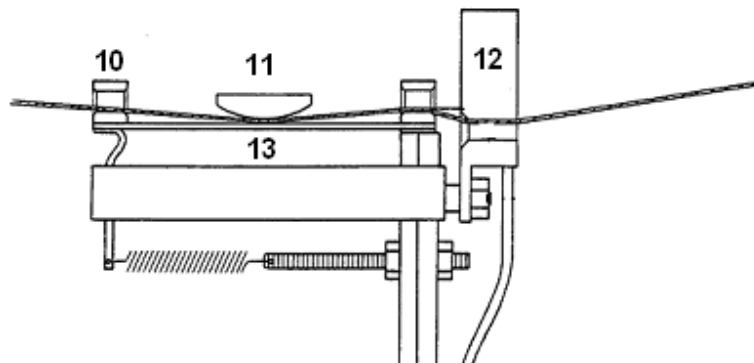
The switch of weft yarn sensitivity is used to adjust the weft stop motion to the yarn count of the weft yarn. In the switch position for the fine yarns, the weft yarn signal is amplified additionally. With the aid of the step switch, it is possible to extend the monitoring phase by 8-30 ms, so that extremely late weft yarn brakages can also be detected.

The shape of the sensing head in combination with the module facilitates an extension of weft yarn signal into the weft yarn return phase. The transverse movement of the weft yarn during the upward movement of the weft tensioner lever reaches its topmost position, the weft yarn leaves the friction part and is thus unable to generate a fault signal. If the weft yarn is broken, there is no weft yarn signal. As a result of this, the machine switches **off** and the yellow signal lamp begins to flash. The diode light up on the module control cabinet.



12. Sensing head 17. Projectile 23. Amplifier box 24. Flight trigger

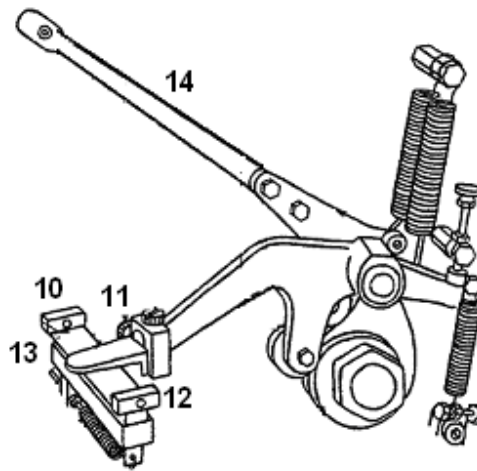
Brake band and brake shoe : The weft yarn passes over brake band and under brake shoe, brake shoe apply on weft yarn after complete weft insertion i.e. reaching of projectile in receiving unit, to stop weft supply.



10. Eyelet 11. Brake shoe double 12. Electronic Weft Stop Motion 13. Brake band

Function weft tensioner lever: - The weft tensioner arranged between the weft package and the shed comprises the weft grace and the weft tensioner lever. In the interaction of same, these parts perform the following tasks;

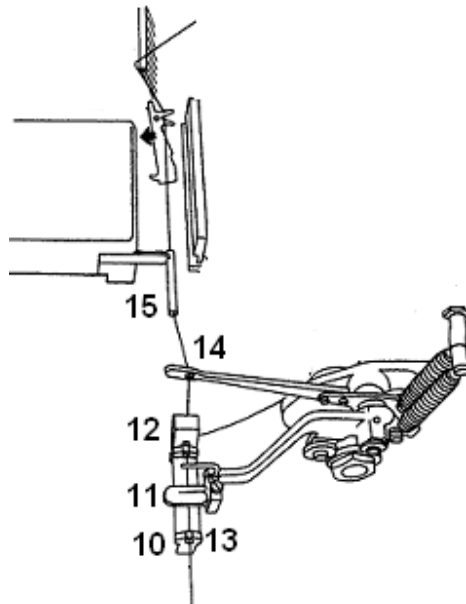
- (A) Braking of the weft yarn at the end of the weft insertion.
- (B) Taking up of the inserted weft yarn so that it can be gripped on both sides in the stretched condition by the selvedge grippers.
- (C) Taking up of the cut-off weft end during the recovery period so that it can be taken over in the stretched condition by the projectile following.
- (D) Delivery of the stored weft yarn in such a way that it acts as a buffer reserve between the weft package and the projectile during the acceleration stage.



10. Eyelet 11. Brake shoe double 12. Electronic weft stop Motion 13. Brake band
14. Weft tensioner lever

Function of projectile feeder: - The projectile feeder holds the end of the weft yarn coming from the weft package with its vertically positioned gripping elements. The projectile with opened grippers is raised to the level of the weft yarn so that it grips the weft yarn in a horizontal position behind the gripping surface of the projectile feeder, after this, the outer projectile feeder opener forces the gripping elements apart to enable the projectile to slide out with the weft yarn during the weft transfer mechanism and projectile accelerate by picking shoe. The projectile feeder then moves inwardly to the edge of the fabric where its gripping elements are force apart again by the inner projectile feeder opener. The centering blade presses the extended weft yarn between the opened gripping elements which grasp the weft yarn when they close. Once the scissors have cut the weft yarn, the projectile feeder brings the free end of the weft to the outer position for transfer to the projectile.

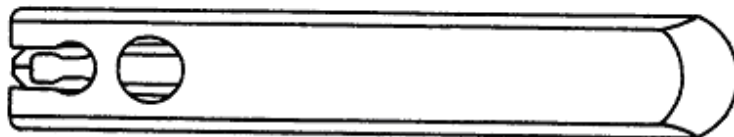
The gripping force of projectile feeder gripping jaws are 1400 to 1600 gm on lower jaw and 1000 to 1200 gm on upper jaw. The difference between the upper and lower jaw should not be more than 400 gm.



Passage of weft yarn

10. Eyelet **11.** Brake shoe double **12.** Electronic weft stop Motion **13.** Brake band
14. Weft tensioner lever **15.** Filling Tube

Function of projectile: - With their riveted grippers, the projectiles take the weft yarn from the projectile feeder. After this, they are accelerated by the picking mechanism and draw the weft yarn through the shed. In the receiving unit, the projectile are broken, relieved of the weft yarn and expelled into the conveyor chain transports the projectiles under the warp back to the picking unit, and deposits them in the projectile lifter. The latter brings the projectiles to the picking position.



17. Projectile

Second Mid Term Test Session 2017-18

B TECH VII SEM TEXTILE TECHNOLOGY AND TEXTILE ENGINEERING

MODERN METHOD OF FABRIC PRODUCTION/ MODERN WEAVING MACHINE

QUESTION1. What do you understand the cover factor of a fabric. Suggest the machine

Which is suitable for good cover factor. Explain the construction and

working of beat up mechanism of projectile weaving machine.

ANSWER

Cover factor - Cover factor is a number that indicates the extent to which the area of a fabric is covered by one set of threads. For any woven fabric, there are two cover factors: a warp cover factor and a weft cover factor. Under the cotton system, the cover factor is the ratio of the number of threads per inch to the square root of the cotton yarn count.

The weaving machine of crank beat up mechanism is suitable for good cover factor.

Construction and working of beat up mechanism of projectile weaving machine.

Sley Drive: - The sley drive comprises the sley bar with its drive and the guide teeth which guide the projectile in the weaving shed. During the insertion of the weft, the sley bar remains in the rear position. At the same time, the guide teeth line up with the fixed guidance parts in the picking and receiving unit. During the beat up of the sley bar, which is controlled by double cams, the guides teeth leave the shed in a downward direction.

