Basic Textile Operations

Level -I

Learning Guide -40

Unit of Competence: -perform spinning operations

Module Title: - : **Performing Spinning Operations**

LG Code: IND BTO1 M09 LO1-LG-40

TTLM Code: IND BTO1 TTLM 0919v1

LO 2: Operate and monitor spinning machines

Instruction Sheet	Learning Guide 31

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Ring frame machine
- Open end (Rotor) machine
- Advantages and disadvantages of rotor versus with ring frame
- Starting and stopping machines
- Monitoring machine operations
- Sorting Waste according to standard procedure
- Cleaning machines
- Identifying and correcting spinning machines faults and product process
- Reporting major machine faults

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- Operate Ring frame machine
- Operate Open end (Rotor) machine
- Know Advantages and disadvantages of rotor versus with ring frame
- Start and stop machines
- Monitor machine operations
- Sort Waste according to standard procedure
- Clean machines
- Identify and correct spinning machines faults and product process
- Report major machine faults

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” **in page -.**
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.

7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Ring frame machine

1. Ring frame machine

Ring spinning machine or ring frame is used to produce required **count of yarn** from the supplied roving by the drafting. To insert sufficient amount of twist to the yarn. To wind the yarn onto the bobbin. To build the yarn package properly.

Fig.2.1. Ring Frame Machine

1.1. Objective of ring frame

Main objectives of ring frame machine are:

- to draft the roving until the required fineness is achieved,
- to impart strength to the fiber, by inserting twist
- To wind up the twisted strand (yarn) in a form suitable for storage, transportation and further processing.

1.2. Main parts of ring frame

Different portion of ring spinning machine:

1. Roving bobbin

2. Roving
3. Bobbin holder
4. Guide roller
5. Drafting arrangement
6. Guide
7. Lappet
8. Bobbin tube
9. Ring
10. Ring rail

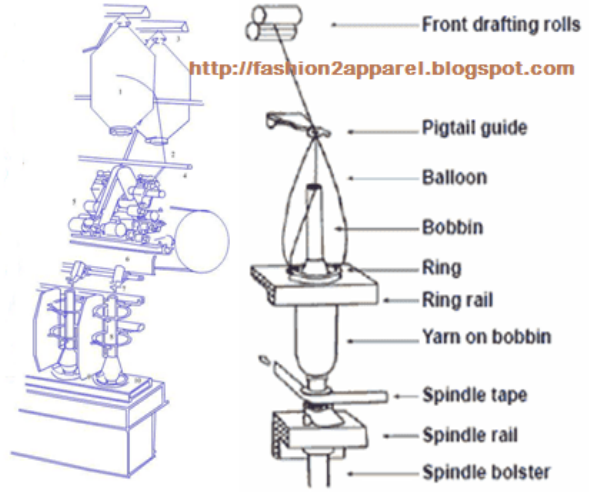

Fig.2.2. Different parts of ring spinning frame

A brief description of important parts of ring spinning machine:

Spindle:

Spindle is a hollow cylindrical tube, consists of mainly two parts (upper parts bolster) and capable to run high speed. Normally upper part of spindle is taper, which holds ring cop and bolster is fixed to the ring rail by nut. Spindle is driven by tape at the position of whorl. The diameter of whorl is important for high speed.

Lappet:

Lappet consists of thread guide and an arm. This thread guide lead the yarn centrally over the spindle axis and arm fix at lappet rail.

Balloon control ring:

Balloon control ring is a ring, which control or reduces the diameter of yarn ballon at middle position. Actually it divided the balloon into two sub-balloons. Normally yarn ballon is formed during twisting and winding of yarn at ring spinning machine.

Separator:

Separator is an aluminum or plastic plate, which is placed between the individual spindle to prevent the hurled of broken thread to neighboring yarn making balloon.

Ring:

This is the renowned ring, so for the frame is named as ring spinning frame. Most commonly carbon steel is used; but different hardened steel is also used. The ring is tough and hard. The range of its surface hardness is between 800-850 Vickers. Ring diameter varies 38-54 mm.

Feature of a good ring:

- Exact roundness.
- Best quality raw material.
- Good, but not too high, surface smoothness.
- An even surface.
- Good, even surface hardness, higher than that of the traveller.
- Long operating life.
- Correct relationship between ring and bobbin tube diameters.
- Perfectly horizontal position.
- It should be placed exactly centered relative to the spindle.

1.3. Operations of ring frame

Basic Principle of Ring Spinning

The roving bobbins are inserted in holders on the creel (Fig.). Guide bars guide the roving's into the drafting system, where they are drawn to their final count. The drafting system is at an angle of 45-60° and is one of the most important units on the machine, since it exerts a very considerable influence on the uniformity of the yarn in particular. After the resulting thin ribbon of fibers leaves the delivery roller, the twist necessary for imparting strength is provided by spindle rotating at high speed. In the process each rotation of the traveler on the spinning ring produces a twist in the yarn. Ring traveler is also necessary for taking up this yarn onto a tube mounted on the spindle. This traveler - a Remnant of the flyer on the roving frame moves on a guide rail around the spindle, the so-called ring. The ring traveler has no drive of its own; it is dragged with spindle via the yarn attached to it. The rotation of the ring traveler lags somewhat behind that of the spindle due to the relatively high friction of the ring traveler on the ring and the atmospheric resistance of the traveler and the thread balloon between yarn guide eyelet and traveler. This difference in speed between the spindle and the traveler

results in the thread being wound onto the tube. In contrast to the roving frame, the Ring spinning machine spindle operates with at higher speed than the traveler. The yarn is wound up into a cylindrical cop form by rising and lowering of the rings, which are mounted on a continuous ring rail. The layer traverse of the ring rail is also less than the full winding height of the tube. The ring rail therefore has to be raised slightly (shift traverse) after each layer has been wound. For a time, machines were also built featuring shift traverse produced by lowering the spindle bearing plate rather than raising the ring rail.

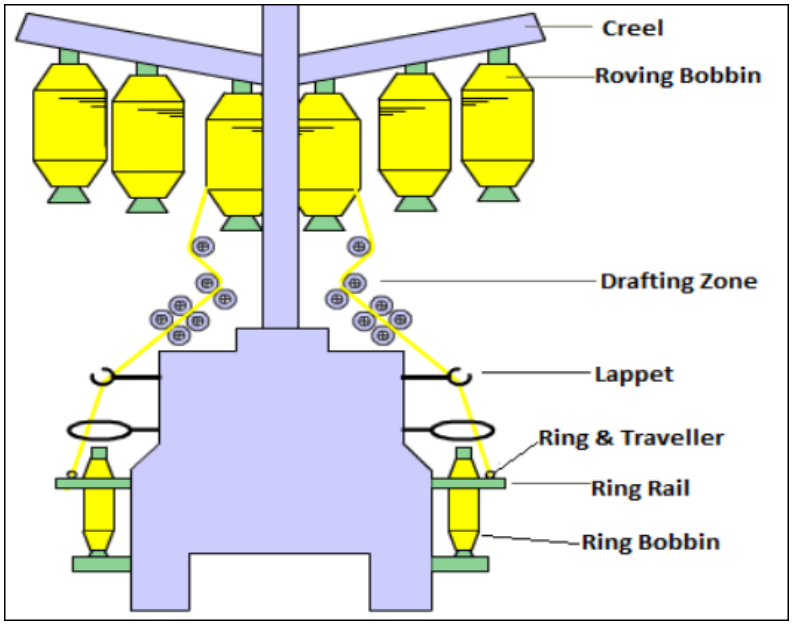

Fig.2.3. Operation of ring frame

1.4. Production calculation

Formula of Ring Frame Production:

$$\text{1. Ring Frame (100\% Production)} = \frac{\text{Spindle Speed x 60 x 24 x Total no of Spindles}}{\qquad\qquad}$$

Count x TPI x 840 x 36 x 2.2046

2. Ring Frame (Actual Production) = 100% Production x Required Efficiency

$$\text{3. Ring Frame (Required Input)} = \frac{\text{Actual Production}}{(100 - \text{std waste})/100}$$

4. Required TCP X Required TPI = Existing TCP X Existing TPI

5. TPI Calculation: TPI = TM √ (Count) (TM= Twist Multiflyer)

6. Traveler speed = spindle speed – winding speed

7. Winding speed = front roll delivery(inches per min)/bobbin circumference

8. Traveler angle = bare bobbin dia/full **bobbin** dia

Self-Check -1	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the ext page:

1. What are the objectives of ring frame spinning machine? (3 pts.)
2. What are the main parts of ring frame machine? (4 pts.)

Note: **Satisfactory rating – above 5 points Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1. _____
   _____
   _____
   _____
2. _____
   _____
   _____
   _____
   _____
   _____
   _____

Information Sheet-2	**Open end (Rotor) machine**

2. Open End (Rotor) Machine

Fig.2.4. open end (rotor) machine

2.1. Objective of rotor

Rotor spinning was initially developed with two main objectives:

- To provide a more economical spinning system than conventional ring spinning through higher productivity
- To produce yarn of a quality that matches or surpasses that of conventional ring spinning.

2.2. Main parts of rotor

Parts of Rotor:-

1. The feed roller and feed plate
2. A saw-tooth or pin-covered roller called an **opening roller**
3. A tapered tube termed the **transport channel**
4. A shallow cup called a **rotor** (a groove is cut into the internal peripheral surface, termed the **rotor groove)**

5. A flanged tube (called the **doffing tube**) which faces the rotor base, coaxial to the rotor spindle
6. A pair of delivery rollers that feed the spun yarn to the winding unit.

Fig.2.5. Parts of rotor

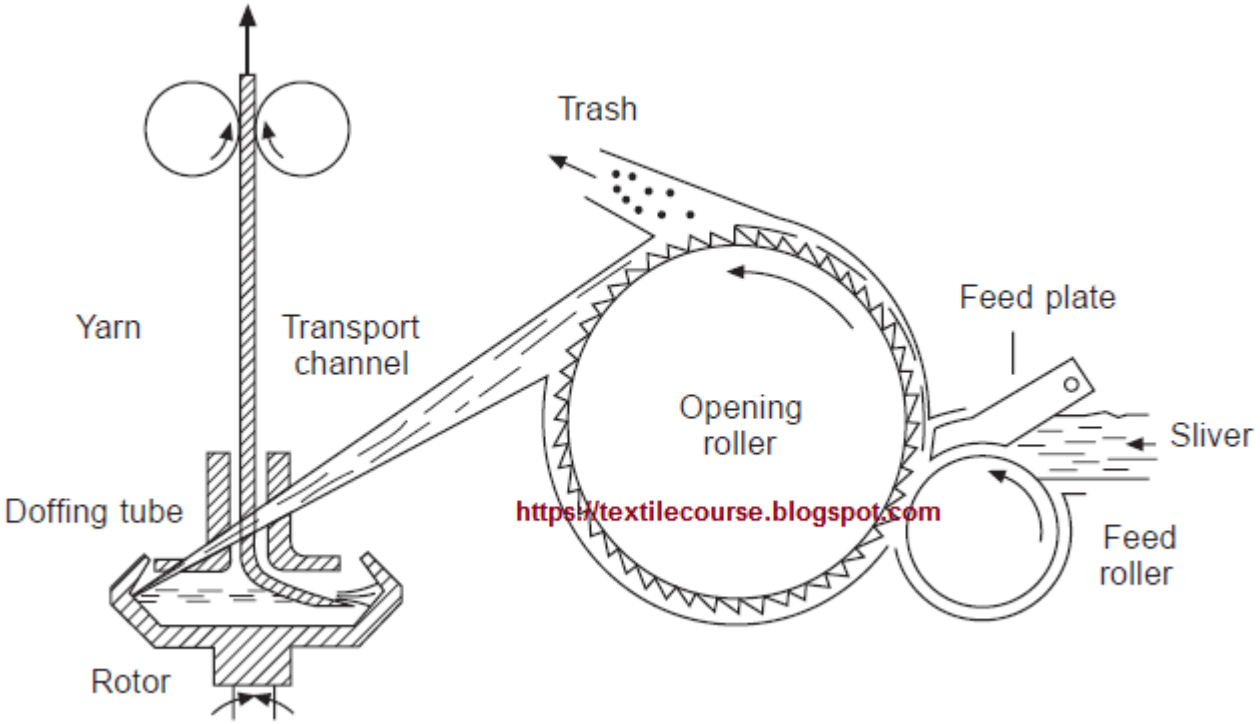

Fig.2.6 position of machine parts

2.3. Operations of rotor

Operations Of Rotor Spinning:

The **rotor spinning** machine is unlike any other machine in the short staple spinning mill in the range of tasks it has to perform, namely all the basic operations:

- **Sliver feed:** A card or draw frame sliver is fed through a sliver guide via a feed roller and feed table to a rapidly rotating opening roller.
- **Sliver opening:** The rotating teeth of the opening roller comb out the individual fibers from the sliver clamped between feed table and feed roller. After leaving the rotating opening roller, the fibers are fed to the fiber channel.
- **Fiber transport to the rotor:** Centrifugal forces and a vacuum in the rotor housing cause the fibers to disengage at a certain point from the opening roller and to move via the fiber channel to the inside wall of the rotor.
- **Fiber collection in the rotor groove:** The centrifugal forces in the rapidly rotating rotor cause the fibers to move from the conical rotor wall toward the rotor groove and be collected there to form a fiber ring.
- **Yarn formation:** When a spun yarn end emerges from the draw-off nozzle into the rotor groove, it receives twist from the rotation of the rotor outside the nozzle, which then continues in the yarn into the interior of the rotor. The yarn end rotates around its axis and continuously twists-in the fibers deposited in the rotor groove, assisted by the nozzle, which acts as a twist retaining element.
- **Yarn take-off, winding:** The yarn formed in the rotor is continuously taken off by the delivery shaft and the pressure roller through the nozzle and the draw-off tube and wound onto a cross-wound package. Between takeoff and package, several sensors control yarn movement as well as the quality of the yarn and initiate yarn clearing if any pre-selected values are exceeded.

PRINCIPLE OF ROTOR SPINNING:

- The general principle of open end rotor spinning is shown in Fig.

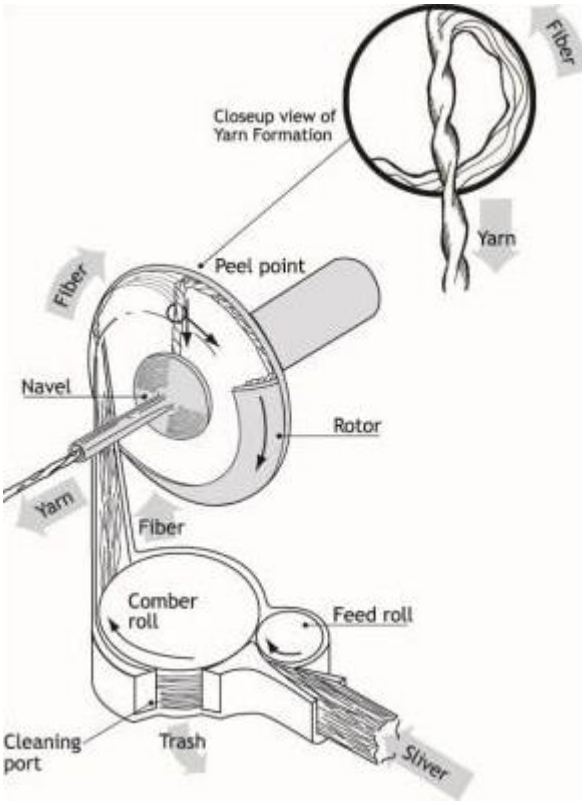

Fig. 2.7. Principle of open end rotor spinning

- The input sliver is first opened and drafted by the opening roller. The fibers are transported via a tube to the rotor where the fiber strand is subjected to twist insertion.
- After twisting, the output yarn is then wound into ‘cheese ‘or ‘cone’ packages of the required size. The input sliver can be a carded or drawn sliver. Generally a drawn sliver is used. The sliver is pulled through a condenser by a feed roller, operating in conjunction with a spring-loaded feed pedal. The nip point between feed roller and feed pedal determines the position of fiber bundles moving into the opening roller.
- A sliver may have more than 20,000 fibers in its cross-section. This means that a yarn of 100 fibers in a cross-section will require a total draft of 200.
- This amount of draft is substantially higher than that in ring spinning. Drafting in rotor spinning is accomplished first using an opening roller (mechanical draft) which opens the input sliver, followed by an air stream (air draft).
-
- The rapidly rotating opening roller combs out the leading ends of fibers. The separated trash is collected in a central chamber from where it can be removed. The fiber from the opening roller is sucked through a transport tube and deposited into the inner grooved surface of the rotor.
- The transport tube is tapered so as to create an accelerating air stream, which straightens the fibers. These two operations produce an amount of draft that is high enough to reduce the 20,000 fibers entering the opening roll down to few fibers (2–10 fibers) at the exit of the transport tube.
- Consolidation in rotor spinning is achieved by mechanical twisting. The torque generating the twist in the yarn is applied by the rotation of the rotor.
- The amount of twist (turns per meter) is determined by the ratio between the rotor speed (rpm) and the take-up speed (meters/min). Every turn of the rotor produces a turn of

twist. The winding operation in the rotor spinning is completely separate from the drafting and the twisting operations.

2.2.4 Production calculation

To calculate spinning production the following parameters are needed:

- ✓ Number of machine (rotor)
- ✓ Numbers of rotors per machine
- ✓ Rotor revolution per minute rpm
- ✓ Yarn count to be produced
- ✓ Twist per inch
- ✓ Efficiency
- ✓ Waste (%)
- ✓ Front roller (delivery speed) =rotor RPM/TPI

- **Example:**
- No of m/c-10
- No of rotor/machine-50
- rotor RPM-100000
- Avg count-16
- TPI-20
- Efficiency-0.9
- Waste-0.5%

FRD (front roller Del):

= Rotor RPM/TPI 100000/20

=5000

Production/Day/Machine:

= (FRD*60*8*3*EFFI*No of rotor)**/**(840*36*2.202*count)

= (5000*60*8*3*0.9*50)**/**(840*36*2.202*16)

=304.1067 kg/day/machine

Total production/day:

=304.1067*No of m/c

=304.1067*10

=3041.0666 kg/day

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the ext page:

1. The output of rotor machine is_____.(2 pts.)
   A) Grey fabric

B) Lint fiber

C) Sliver

D) None

2. Which of the following not a part of rotor? (2 pts.)

A) Rotor

B) Sliver

C) Sliver feed roller

D) Opening roller

3. The main purposes of rotor are _____and _____(2 pts.)

A) Opening, cleaning.

B) Opening, dust removal

C) Knitting, weaving.

D) A & B

Note: **Satisfactory rating – above 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
2. _____
3. _____

Information Sheet-3	**Advantages and disadvantages of rotor versus with ring frame**

2.3 Advantages and disadvantages of rotor versus with ring frame

Advantages and disadvantages of ring spinning

The most expensive process in yarn production is the insertion of twist into a strand of fibers. This is due to the fact that at each spindle position both the strand mass per unit length and

the strand velocity are very small. As a result, the production at each spindle is severely limited. The capital cost, power cost and labor cost per spindle have been reduced as far as possible by the spinning machinery manufacturers, but they still remain very high in relation to the production rate. This follows directly from the method used both to insert twist and to wind the yarn onto a package.

Generally, ring and traveler systems have the following technical advantages and disadvantages:

Advantages

1. Offer a wide spinning count range (5 – 300 tex)
2. Can process most natural and man-made fibers, and blends
3. Reduce yarns with tensile strength and handling aesthetics suitable for the majority of fabric end uses.

Disadvantages

1. Even with the ideal situation of no end breaks, spinning is still discontinuous because it has to be stopped for doffing
2. To attain high twisting rates (and hence high production speed) the yarn package must be reduced in size, resulting in more frequent stoppages for doffing
3. The maximum speed is restricted by the frictional contact of ring and traveler, and the yarn tension
4. Bobbin size is restricted by ring diameter
5. Yarn has to be re-wound to larger size packages.

Advantages and disadvantages of rotor spinning machine

Advantages:

1. Lower power consumption per unit quantity of yarn produced
2. Higher speed of twist insertion resulting in very high yarn delivery speed
3. A significant resulting increase in productivity
4. Larger delivered package size
5. Elimination of some processes such as roving and winding more uniform yarns

Disadvantages

1. Restricted only coarse counts.
2. High capital cost.
3. Usage restricted in case yarn is weak.
4. Yarn realization in the case of waste mixing will be poor, resulting in increased mixing cost.
5. Wear and tear of rotors, combing rollers, and navels are very high when highly trash content mixing is used resulting in heavy replacement cost.
6. In case reeling is done additional reeling cost is involved resulting in higher manufacturing cost.

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Write down advantages of rotor spinning machine. (4 pts.)
2. Mention disadvantages of ring frame spinning machine. (4 pts.)
3. One of the following is different from others
   E) Rotor
   F) Feed roller
   G) Rotor groove
   H) Drafting zone

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
   _____
   _____
   _____
   _____
   _____
   _____
2. _____
   _____
   _____
   _____
   _____
3. _____

Information Sheet-4	Starting and stopping machines

4. Starting and stopping machine

4.1. Starting

Before starting ring frame machine we should:

- Visually check machine components
- Clean moving parts

- Remove remains of yarns breakages
- Read machine manual (if for first time)
- Understand planed production

  Etc.

4.2. Stop Chart

This visualization shows all the state change of many machines in a determinate interval of time.

For each machine is visualized a bar that adopts different colors according to the state (working, generic stopped, doffing, etc…).

The associated colors to each state are assigned in the menu Settings-Stop Codes.
For every change of state, a brief description of the stop code and the time of state change are written.
Placing the mouse on every colored zone you can visualize deeper information (complete description of the stop/working cause, starting hour, stopping hour, duration).

Self-Check –4	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Why start/stop procedure is important? (5 pts.)

Note: **Satisfactory rating – above 3 points Unsatisfactory - below 3 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
   _____
   _____
   _____
   _____

Information Sheet-5	**Monitoring machine operations**

5.1. Monitoring ring frame

Terminology

- **ARTICLE**: Name and specific characteristics of the product to be produced. The fundamental parameters are the **name** and the **count**.
- **LOT**: name and specific characteristics of the raw material with which to produce a determined job order.

- **JOB ORDER**: name and specific characteristics of the job order to be performed. The fundamental parameters are the article, the required quantity, and the assigned quantity.
- **QUALITY:** list of acceptable production parameters limits. When a real value goes out of the acceptable limits, an alarm is produced and the parameter is underlined in the screen “Alarm”.
- **PRODUCTION**: when a job order is assigned to a particular machine, a production is created. The fundamental parameters are the name and the assigned quantity.

Formula and Measuring Units

To calculate all the data visualized by Eureka Spinning, the program uses the data saved by spinning and are used various mathematical formula.

When spinning has to write some data associated to a unity of measure, it uses the following unities:

PRODUCTION: lengths in meters; weight in grams

CURRENT SPEED: meter/minute

CURRENT RPM: rpm (rotations for meter)

COUNT: entered by customer, variable.

TIME: seconds.

Spindles/rotors Information

Every change of the state of the spindle is recorded in the database with a code of 2 numbers. The first one (Dozen) indicate the previous state; the second one (Unit) indicate the new state.

The states are:

0=GOOD.

1=OUT OF RANGE (OR).

4=DISABLED.

5=BROKEN.

8=NON TESTED.

The state 8 will not be written in the database, so preceding state will be preserved.

Example of one recording of state:

05 = changed from good to broken.

51 = changed from broken to FT.

54 = changed from broken to disabled.

40 = changed from disabled to good.

Immediately after the shift starts, a function in the database records the actual state of the spindles not good.

Then, at the shift starting different code types will be recorded:

55 currently broken

44 currently disabled

11 currently OR

This allows reconstructing the state of all the spindle of the machine at the shift starting,

without having to go back to the database to search the last change of state.

The recording of the code 55, allow also improving the formula..

Working Breakages.

This variable counts how many yarns have been broken during the working state.

or, how many spindles went from Good state or OR to Broken.

Self-Check –5	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. You should consider all parameters when monitoring spinning process except: (2 pts)
   A) Rotor speed
   B) Total production of ring frame
   C) Data reporting of spinning

D) None

2. Total produced in spinning process is determined by_____(2 pts.)
   A) Kg
   B) Meter
   C) Bale
   D) A &B

Note: **Satisfactory rating – above 3 points Unsatisfactory - below 3 points**

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

Short Answer Questions

2. _____
3. _____

Information Sheet-6	**Sorting Waste according to standard procedure**

6. Sorting Waste according to standard procedure

Waste Management in Textile Mills

Textile collection for consumers is the most common way of recycling textile reuse through reselling or donating to charity (Goodwill Industries, Salvation Army, etc.). The textiles must be clean and dry in order to be accepted for recycling. Some companies accept their product back for recycling. Other companies are for-profit textile recycling companies using collection bins at a variety of sites. Textile recycling equipment plays an important part in the textile recycling industry Standard and high-efficiency textile recycling equipment is quite important for supporting the textile industry. So far, the most popular and widely accepted clothing recycling bin use a high safety chutes that are easily opened and closed. Resale after collection of the textiles, workers sort and separate collected textiles by color, size and quality, it is then packed, baled and sold as good reusable clothing.

Textile re-processors receive wet or soiled clothes, however, these may still end up being disposed of in landfill, as the washing and drying facilities are not present at sorting units. This then affects the environment. Process Clothing fabric generally consists of composites of cotton (biodegradable material) and synthetic plastics. The textile's composition will affect its durability and method of recycling. Fiber reclamation mills grade incoming material into type and color.

The color sorting means no re-dying has to take place, saving energy and pollutants.

The fibers can also be compressed for mattress production. Textiles sent to the flocking industry are shredded to make filling material for car insulation, roofing felts, loudspeaker cones, panel linings and furniture padding. For specialized polyester based materials the recycling process is significantly different. The first step is to remove the buttons and zippers then to cut the garments into small pieces. The shredded fabric is then granulated and formed into small pellets.

The pellets are broken down polymerized and turned into polyester chips. The chips are melted and spun into new filament fiber used to make new polyester fabrics

Dirty waste consists of a large amount of impurities and a smaller amount of fibers. The latter can be recycled in different recycling plants.

Wastes from all blow room machines and cards is sucked directly through the Uniclean cleaner of the recycling equipment to a mixing bale opener. The mixing bale opener continuously feeds the cleaned material back into the blow room line. If dirty waste is involved, an additional UNIflex B 60 cleaner should be inserted between the mixing bale opener and the point of feed into the blow room line. This installation can also be operated in off-line mode if the secondary raw material is not re-blended immediately but pressed into bales in a bale press. Installed equipment can be designed for continuous (on-line) or batch (off-line) operation. Continuous operation implies that secondary raw material is blended with the primary raw material again in the same quantity, and that this takes place permanently and immediately after recovery. For this purpose, the reclaiming installation can deliver to a bale opener (e.g. Waste opener), or the material can be blown directly into the ducting of the blow room line. Here, the reclaiming installation is an integral part of the blow room. On the

other hand, batch operation implies that the secondary raw material is first pressed into bales following recovery, and is then fed to the blow room in the same way as other bales. In this system, all waste chambers of the blow room machines, cards and combing machines are connected by suction ducts to central suction equipment that leads to pneumatic bale presses (or silos). In order to keep the various types of waste (comber waste, licker-in droppings, etc.) separate from each other, a bale press is required for each specific type. Such presses are available from Autefa, Bisinger, etc. If only one bale press is available, an individual silo must be provided for each type of waste. About three bale presses (or silos) should be sufficient for a normal cotton spinning mill. Waste chambers (one or more at a time) are selected intermittently and cyclically for suction, and the contents are blown into the presses, e.g. first from all blow room machines.

The Reiter plant is described here briefly by way of an example. Almost all manufacturers of conjunction with LUWA will be described here as representative of all the others. Primary waste is pneumatically fed via condensers into the B 34 mixing opener, pre-cleaned in the Unclean B 12, deducted in the A 21 condenser and cleaned further in the B 51R fine cleaner. The transport air is always separated from material and fed to the pre-filter. The yield of good fibers is fed into the bale press. Secondary waste from the recycling machines and pre-filter is fed into the bale press for black waste. Since the same types of machines are used in this recycling installation as in the spinning, handling is easy for the operators. Dirty waste materials are preferably collected, baled, packed and removed so that manual handling is excluded as far as possible. There are several possibilities for baling and packing:

Wastes in spinning process

- ❖ pnemaphil
- ❖ bonda
- ❖ roving waste
- ❖ thread waste
- ❖ fly dust
- ❖ sweeping waste

Waste reduction procedure/factors for wastage reduction

- ❖ raw materials selection
- ❖ spindle/rotor speed
- ❖ machine setting
- ❖ twist of yarn
- ❖ machinery condition
- ❖ RH% and temperature
- ❖ Proper material handling
- ❖ Adequate supervision

Waste materials in spinning section which cannot be reused

- coarse dirt remaining after recycled

- fly from the preliminary filters
- dust from the fine filters

Self-Check –6	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What are causes of waste to be generated? (5 pts.)
2. Write at least four of spinning wastes. (4 pts.)

Note: **Satisfactory rating – above 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1. _____

_____

_____

_____

_____

_____.

2. _____

_____

_____

_____

Information Sheet-7	**Cleaning machines**

7. Cleaning machines

Cleaning of spinning machines & Waste disposal:

- Carry out cleaning of machine at periodic intervals as instructed.
- Clean the creeling area at periodical intervals & keep the creeling zone free from fluff & dust accumulation.
- Use the cleaning equipment given to clean the drafting Zone/rotor. Periodically arrange to clean the top roll clearer roller (Scavenger Roller).Ensure that the clearer roller is always kept clean.

- If there is any over lapping noticed, remove the roller lapping manually or with tools provided, without damaging the cots.
- Clean pneumafil pipes and ensure that the suction orifices are free from fluff accumulation.
- Collect the roving wastes and yarn waste in the hip bag provided and deposit them
- Category wise in the designated bags at specified places.
- Clean around the Ring frame/rotor machine using proper cleaning equipments.
- Keep the Ring frame/rotor department clean.

Importance of Health & Safety

- Follow the work & safety instructions and adopt safe working practices like not opening the doors of the machine, not cleaning the interior parts & not taking any choked material when the machine is in running condition.
- Follow the safe working practices at the time of doffing.
- Always use head cap, face mask and ear plug in the work spot.
- Do not carry any metallic parts during machine running as there are chances of fire and damage to machine parts.
- Take action based on instructions in t he event of fire, emergencies or accidents, participate in mock drills/ evacuation procedures organized at the workplace as per organization procedures.

Self-Check –7	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Operators in spinning should do all except :(2 pts.)
   A) Clean overhead
   B) Clean rotor
   C) Clean floor
   D) None
2. Write the uses of machine cleaning. (2 pts.)

Note: **Satisfactory rating – above 3 points Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1. _____
2. _____
   _____
   _____
   _____
   _____.

Information Sheet-8	Identifying and correcting spinning machines faults and product process

8. Identifying and correcting spinning machines faults and product process

Identifying ring frame Defects:

- Defects in roving like irregular roving, slubby roving, excessive roving breaks etc, are to be identified and informed to supervisor for necessary action.
- Defects in roving bobbins like soft bobbins, stained bobbins, unequal tapering,
- Uneven and fluff accumulated bobbins etc are to be identified and informed to supervisor for necessary action.
- Defects in spinning cops like, uneven cops, stained bunch of yarn wound etc., are to be identified and informed to supervisor for necessary action.

The Faults found in spinning Yarn and Their Causes are given below –

1. **Soft yarn** – Generally caused by slack spindle bundles, twist change wheel too large, empty bobbins not properly pushed down during doffing.

2. **Uneven yarn** – Either travellers are too heavy or for spinning fine counts from inferior cotton.
3. **Fuzzy yarn** – Rings too large, by ballooning or bad lubrication of ring frame rollers.
4. **Twisty and brittle yarn** – Worn rings and travellers are too heavy or lack of humidity in spinning room.
5. **Rough yarn** – Traveler too light, too much twist, and spindle speed too low, bobbins that are rough at the top.
6. **Badly wound yarn** – Caused by the defective traveller motion and also by bobbin being loose on the spindle.
7. **Tender yarns –** Imperfect traveller, waste on travellers, adjustment of ring rail not correct, thread guide not in the right position.
8. **Hard and inelastic yarn** – Too much twisting and drafting in the draw frame and also for insufficient doubling later.
9. **Slub** – This occur when the twist in the yarn is not uniform. It appears as thick place, which has received insufficient twist. This is caused by what is called thick roving. Two roving over lapping each other, which thus passing through the rollers without receiving the amount of twist required.
10. **Nepped yarns** – So called because it contains small piece of hard cotton called neps. These are two kinds: Commonly distinguish as natural neps and will neps. The former consists of short and undeveloped fibres that have become embedded in the yarn. The latter are impurities and also short fibres usually found adhering to the surface of the threads.

Note: faults and their causes are listed above, so it is easy to correct the faults if Causes are known.

Self-Check –8	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1._____is occur when the twist in the yarn is not uniform.(2pts.)

A) Nepped yarn

B) Slub

C) Tender yarn

D) None

2. What is the cause of **soft yarns** to be formed? (3 pts,)

3. Name at least four yarn faults with their cuases. (4 pts)

Answer Sheet

Note: **Satisfactory rating – above 3 points** **Unsatisfactory - below 3 points**

Score = _____

Rating: _____

Name: _____ Date: _____

1. _____
2. _____
3. _____

_____

_____

_____

_____

_____

Information Sheet-9	Reporting major machine faults

9. Reporting major machine faults

The spinning process produce the better yarn with optimal yarn properties than other spinning systems, but the ring spinning system have the speed limitation reach higher spindle speed then it causes to make the yarn with inferior quality. So now a days it is difficult task for all textile technologists to make better quality of ring spun yarn at very high spindle speed. The productivity of ring frame is a major factor contributing to the profitability of a spinning mill and higher spindle speed has become necessary for higher productivity. Problems encountered in spinning yarns at high spindle speeds include yarn breakage rate, hairiness, and strength loss and fly generation.

The main machine defects to reported are:

- End breakage
- Idle spindle
- Worst spindle

Causes of machine defects

- ❖ Machine speed
- ❖ Untrained operator
- ❖ Improper maintenance
- ❖ Carelessness of operator

Self-Check –9	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List the major machine defects in spinning machine. (2 pts.)
2. Write causes of defects of machine in spinning process. (3 pts.)

Answer Sheet

Note: **Satisfactory rating – above 3 points** **Unsatisfactory - below 3 points**

Score = _____

Rating: _____

Name: _____ Date: _____

1. _____

_____

_____

_____.

2. _____

_____

_____

_____

_____