AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
Accredited by NAAC with "A+" Grade
Department of Production Engineering (Sandwich)

AN

PROJECT REPORT

AT

Lok Nayak Jayprakash Narayan

Sahakari Soot Girni Ltd.

SUBMITTED BY

URVESH PATIL (SEAT NO. B150217553)

UNDER THE GUIDANCE OF

Prof. Y R CHANDWADE

(YEAR 2020-2021)

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CERTIFICATE

This is to certify that the Project Report
entitled

Project Name

Maintenance of Spinning or Ring Frame
Machine

Submitted by

MR. URVESH PATIL SEAT NO. B150217553

Is a Bonafide work carried out under the supervision and guidance of Prof. Y R Chandwade and it is approved for the partial fulfillment of the requirements of Savitribai Phule Pune University, for the award of the Degree of Bachelor of Engineering (Production Sandwich). Project report has not been earlier submitted to any other Institute or University for the award of any Degree or Diploma.

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(Prof. S H Wankhade)
Head,
Production Engineering Department

(External Examiner)

Place: Pune

Date:

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Abstract:

Machines play a major role in determining the productivity of an industry, the quality of its products, power consumption and working atmosphere. All these factors are dependent on the mechanical condition of the machine in spinning units it is also very important that the condition of the major machines is maintained by systematic and well-planned maintenance practice.

Chapter deals with such important aspects of maintenance management as maintenance scheduling. Proper maintenance management helps companies to improve profitability, product quality and customer relationships.

Project

Maintenance of spinning machine

Introduction:

Maintenance defined as the process of systematic activities done for keeping the mc or equipment's at the level for well run or its proper services. Machines play a principal role in determining the productivity of an industry, the quality of its products, power consumption and working atmosphere. In spinning maintenance of spinning machines are very important for gettingproper efficiency. Because the performance of the spinning mill depends on the proper maintenance of spinning machines. maintenance function of a company run on modern principles gives major weightage to production availability, to machine performance rates, to cost of operations and of maintenance. Maintenance of machines includes all efforts directed to keep all the machines in good health at minimum cost. This leads to smooth and efficient working of an industrial plant, thus helping to improve the productivity and hence the profitability of company. Effective maintenance is defined as that which gives the maximum level of availability as well asperformance of plant. This is achieved through maintenance management, involving planning, organizing, control and execution directed at specified objective that ensure so that the company achieves its business objectives.

The machine which converts the roving into desired yarn count is called ring Fram. It is the most commonly used method in yarn manufacturing The roving obtained from simplex machine gets used as input materialin the ring frame process.

In case of modern textile machinery, with their rising cost, complications, and automation, the necessity of maintenance has become very severe. The machine plays a very important role in determining the productivity of the mill, quality of products, power consumption & so on. Hence, in spinning units, it is important that condition of major machines is maintained by systematic andwell-scheduled maintenance practices.

Types of Maintenance of Machine in Yarn Spinning Mills:

The following types of maintenance are carried out in spinning machines:

- Breakdown Maintenance
- Planned Maintenance

Breakdown Maintenance

The breakdown may occur at any time unexpectedly and handling such breakdowns is known as breakdown maintenance. In this type, attention is given to machine for maintenance only when thebreakdown of parts occurs.

Planned Maintenance:

In this type, maintenance is carried out as per predetermined plan. It has following

1. **Routine Maintenance**

This maintenance type is performed to ensure efficiency of the machine. It is carried on the basisof a predetermined schedule. General lubrication, cleaning, cot replacement, cots buffing, clothing, grinding etc. fall under the category.

2. **Preventive Maintenance**

As the title indicates, it is performed to prevent damage to parts and machines. In this case, faultsare discovered and remedial action is taken before it affects production and quality. Predictive Maintenance

From this method, we will come to know, what is happening with machine parts, during actualoperation of the machine. It assesses the effectiveness of routine & preventive maintenance.

3. Remedial Maintenance

In this, the parts of the machine are studied and change in design, material, a method is done as per requirement, for improving operation.

4. Restorative Maintenance

It is also known as 'semi-overhauling'. In this method, drastic change in the machine by replacement of a major part is done. This type is expensive and time-consuming. The advantage of this can be taken for automation of particular machine.

Objective of Maintenance:

To maintain machines at maximum operating speed and

efficiency.To minimize the maintenance cost.

To ensure best possible quality of output product.

To reduce lead time and waste occurs due to the breakdown of parts.

The maintenance function of a company run on modern principles gives major weightage to production availability, to machine performance rates, to cost of operations and of maintenance. Maintenance of machines includes all efforts directed to keep all the machines in good health at minimum cost. This leads to smooth and efficient working of an industrial plant, thus helping to improve the productivity and hence the profitability of company.

Condition Monitoring

Condition monitoring is another method used for planned replacement. This can be used wherever the failure development process can be accessed; where the failure mechanism gives some form of early warning signal through detectable changes in the condition of the machine part. This detection can be visual etc or with the help of condition monitoring tool.

1. The rate of deterioration must be slow enough to permit detection of failure development, andthen to make use of the result to plan and to rectify the fault before failure occurs.

2. The deterioration process must exhibit sufficient and detectable change in condition parametersthat are relevant.

3. Proper measuring equipment / tool or adequate competence must be available to detect and to interpret the condition.

Machinery Audit

It means a thorough examination of the mechanical condition of the machine in order to rectify the defect or improve the quality of the product. Machinery audit helps in improving the existing maintenance procedure. It also helps in early detection and prevention of mechanical fault, which may go unidentified, undetected for too long if there is a total reliance on instrumental examinationof the machine.

Machinery audit should generally cover the following aspects.

A critical review of current maintenance program such as method of operations, maintenance schedule, inspection procedure, staff employed and organization.

A detailed investigation of the machine condition in different departments like machine alignment,wear and tear of components, damage etc.

Records

Proper maintenance schedule is always following by a suitable record keeping which is essential for preventive routine/normal and forecast maintenance. For these reasons following records should be maintained.

- Machinery history register
- Schedule register
- Corrective action register
- Indent register
- Maintenance cost record
- Budget
- These records help in deciding
- Frequency of inspections/checkups.
- Extent of reduction in fault reoccurrence.

Safety of maintenance:

Industrial production is a process depending on men and machine. In textile mill, men and machine are to sides of a coin: smooth functioning of the mill depends on science, technology and engineering on one hand. Studies have shown that accidents occurs mainly due to unsafe actions,unsafe conditions and carelessness negligence. The textile industry is today equipped with complicated and fast-moving production machines. So, it necessary that everyone follows safety precautions in order to prevent accidents.

Check Points Before Starting Machine:

1. Check the motor pulley for its mounting and rpm set
2. Check the tension in the spindle belt
3. Check the A, B, C, D gears for the twist set
4. Check the crossing angle
5. Check the electrical connections
6. Check the oil-levels in the cambox and in the bolsters.

Mechanical Trials:

Check the direction of the belt and rotation of the spindles.

Check the rpm of the motor-shaft and the rpm of the spindles with

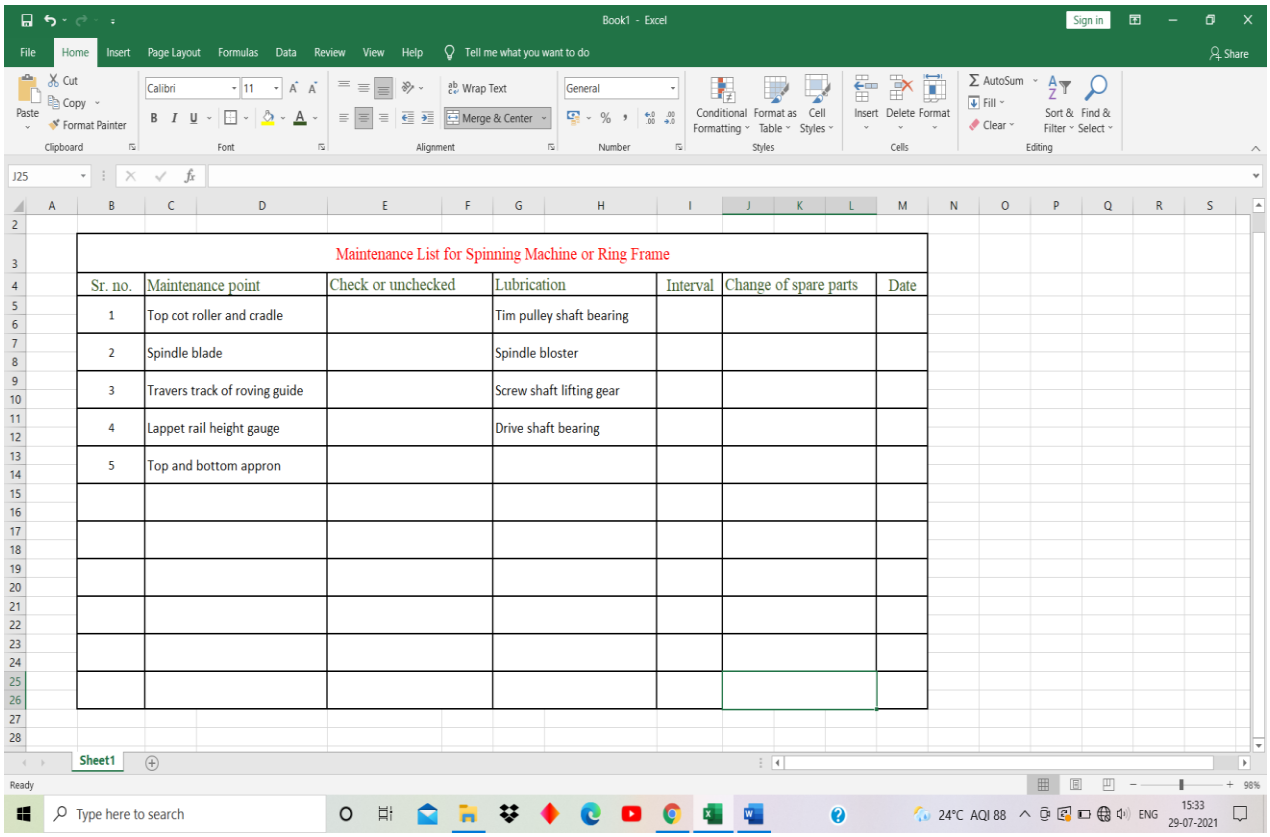
stroboscope.Check the circulation of oil in the cam-box.

Check the tracking of belt and make sure that it does not touch the flanges of the tension pulleys.

Alter running the machine for 1hr. with mechanical trial, check all the pedestals and bolsters for normal heating.

Mechanical trial should be conducted for at least 6 hrs.

Created Excel Sheet:



Maintenance List for Spinning Machine or Ring Frame

Sr. no.	Maintenance point	Check or unchecked	Lubrication	Interval	Change of spare parts	Date
1	Top cot roller and cradle		Tim pulley shaft bearing			
2	Spindle blade		Spindle bloster			
3	Travers track of roving guide		Screw shaft lifting gear			
4	Lappet rail height gauge		Drive shaft bearing			
5	Top and bottom appron					

Maintenance point:

1. Created Excel Sheet for Routine or time to time Maintenance of Machine.
2. Changing the break or fault or failure of Spare parts.
3. Lubrication process. (Time to time or duration which asper sheet)

Maintenance points:

SL NO.	Maintenance Points	Work to be done
01.	Top cot roller and cradle	Cleaning
02.	Travers track of roving guide	Checking, Adjusting
03.	Spindle blade	Checking
04.	Top and bottom apron	Cleaning
05.	Ring rail position gauge	Checking, Adjusting
06.	Top roller arm pressure gauge	Checking, Adjusting
07.	Lappet rail height gauge	Checking, Adjusting
08.	Filter box	Checking
09.	Gauge of traveler	Checking, Adjusting
10.	Top & bottom apron	Washing

Lubrication Points:

SL NO.	Lubricating Point	Suggested Lubricans	Interval
01.	Tim pulley shaft bearing	Mobilux EP-2	(03-04) Months
02.	GE gearing	Mobil gear oil632	(03-04) Months
03.	Spindle bolster	Mobile velociteoil 6	(02-04) Months
04.	Drive shaft bearing	Mobilux EP-2	(04-05) Months
05.	Tape tension pulley bearing	Molilith SHC-100	(05-06) Months
06.	Screw shaft lifting gear	Mobilux EP-2	(04-05) Months
07.	Spar gear in the gear box	Mobilux EP-2	(05-06) Months
08.	Screw shaft in the powercylinder	Mobilux EP-2	(03-04) Months
09.	Taper roller bearing in thepower cylinder	Mobilux EP-2	(04-05) Months

Some problems in ring sections:

Ring frame is an important section in the whole plant and it has also the direct relation to theproduction of the plant. A lot of problems occur during process e.g.

(a) Most of the operators don't know how to handle the machine.

(b) Due to lack of training of employees, they can create problems when they work in thedepartment like problems of material handling, wrong traveler, and bobbin color.

(c) Ends breakage is the major problems in the ring machine and it causes an efficiency andproduction loss.

(d) Due to lack of training of maintenance staff, the mechanical fault is creating a problem andloss of mechanical parts, efficiency, and production of the plant.

(e) Improper maintenance is also creating problems related to maintenance and electric fault duringthe running of the machine.

(f) Electric problems also occur due to lack of electric staff and they are unable to take correctiveand preventive action against any fault.

(g) Some faults are occurred due to the manufacturer of a machine like a software problem,communication problem, and load capacity problems.

(h) To prepare a policy statement for the maintenance department, which would explain the basic objectives based on the organizational objectives, and to write standard maintenance procedures, maintenance schedules, lubrication charts, etc.

(i) To coordinate with the production people to ensure that a regular maintenance will be implemented without affecting important production schedules.

Lubrication:

Clean the machine, parts and make it free from yarn, waste and dust. Use only recommended grease and oil for lubricating.

Never use paraffin, wax, kerosene or petrol for cleaning or lubricating any part of machine.

Before changing the oil in the Cambox, drain the existing oil completely and also before refilling,clean the gearbox completely from inside.

Spare Parts of Machine:

Bottom rollers:

With a diameter of 30mm instead of the regular 27, the bottom roller counteracts the build-up offiber lap, especially with long fibers.

Values:

- Reduced build-up of the fiber lapping
- Higher productivity
- High precision

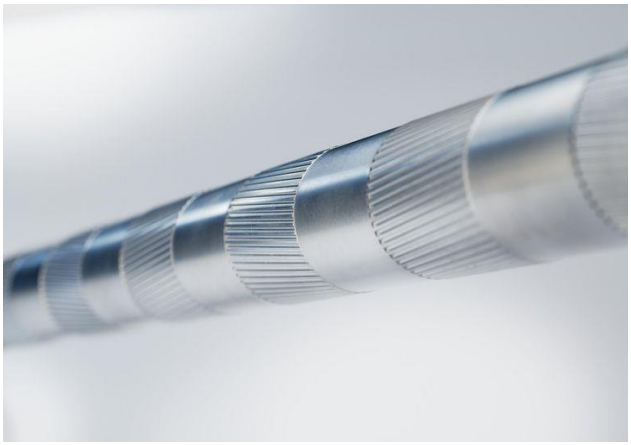


Figure 1.1 Rollers

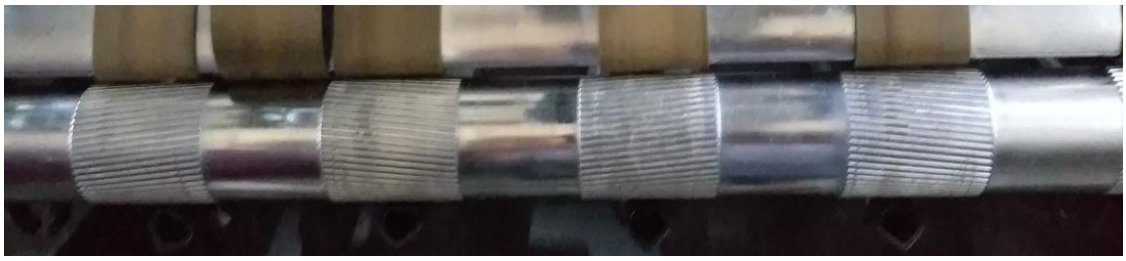


Figure 1.2 Bottom Roller

Spindles:

The most used spindle in premium spinning machines equipped with double damping for maximum vibration absorption at high speed. Features even lower vibration and noise level thanstandard HPS 68 model.

Applications:

- recommended for speeds up to 30 000 RPM
- for all material Ne 14

– 100Advantages:

- second damping system
- superior dynamic performance
- perceivable noise reduction
- minimum wharve diameter of 18.5 mm for highest spindle speeds at minimum speeds ofdriving elements
- can be supplied to each type of ring spinning machine

Figure 1.3 Spindle

Drafting:

Represents the drafting system used in ring frame.

(i) In the ring frame, roving comes from the bobbin is passed through the 3 over 3 rollers doubleapron drafting system.

(ii) In apron drafting system fibre controlling is better; so, it is widely used.

A 3-over-3 roller drafting system with double apron is used to draft the roving at the ring spinningmachine. For cotton spinning, the drafts from the back-to the front-zones usually vary from 1.1 to
1.5 (break draft) and from 6 to 30 (main draft) respectively.

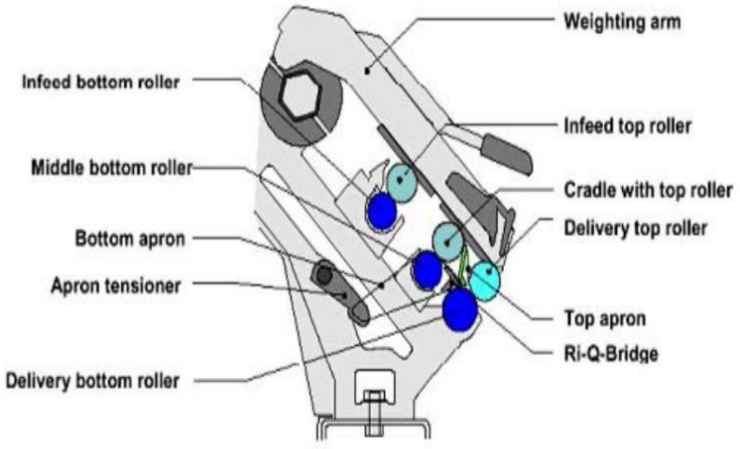


Figure 1.4 Drafting

Figure1.5 Drafting zone

Drafting unit:

The drafting unit of ring frame contains, 3 over 3 rollers double apron drafting system including pressure arm, cradle, nose bar, cot roller and fluted steel roller. represents a drafting- elements of the ring frame.

Components in drafting unit:

(i) Top rollers: cot roller (Rubber coated).

(ii) Bottom rollers: Fluted steel (Straight, spiral and knurled).

(iii) Apron: Top apron (short apron) and bottom apron (long apron). Aprons are used to guide the fibres and control the short fibres.

(iv) Cradle: Gives the shape of a top apron.

(v) Nose bar: Gives the shape of a bottom apron.

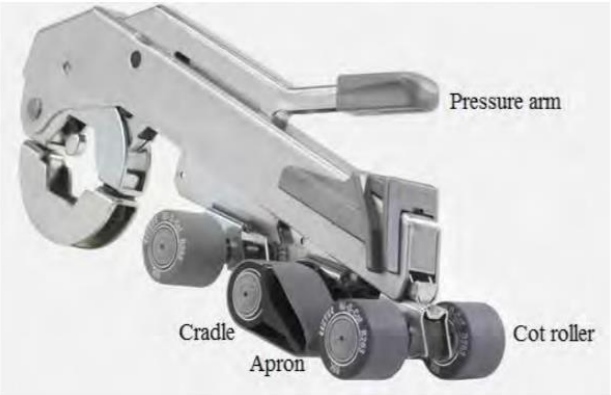


Figure 1.6 Drafting unit

Figure 1.7 Top Cot

Figure 1.8 Bottom Cot

Lappet:

It is a guide made by bending a wire named snail wire. Snail wires may be of different types, like p-shaped wire.

Functions of lappet:

(i) It's the main function is to maintain the security of yarn.

(ii) It prevents yarn's collision with adjacent yarns.

(iii) Its surface should be smooth to prevent rubbing of yarn. Due to rubbing yarn hairiness increases.

Figure 1.11 Types of Lappets

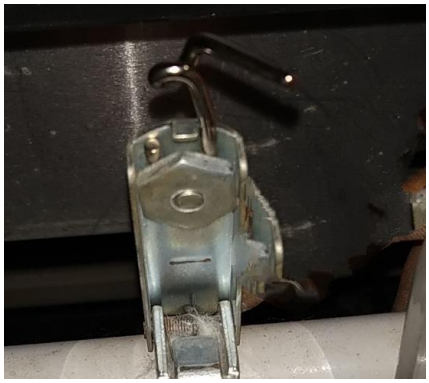


Figure 1.12 Lappet

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. Ring diameter varies 38-54 mm.

Traveler:

Traveler is the tiniest and simple mechanical element in a ring frame which carries the most important function like simultaneous twisting, winding, yarn guiding etc.

Figure 1.13 Ring traveler ring

Feature of a good ring:

- Exact roundness.
- Long operating life.
- It should be placed exactly centered relative to the spindle.

ABC ring:

It is made by bending a steel wire in circular form situated after the lappet. One end of the yarn ison lappet guide and the other end on the traveler.

Figure 1.14 ABC Ring

Aprons:

Aprons which are used on ring spinning machines and roving frames are made of three layers which consists of outer layer, reinforcement layer, and inner layer. The outer layer is finish ground to give it a defined roughness for optimum fiber guidance, while the reinforcement gives the apronits dimensional stability.

Figure 1.15 Bottom Apron

Figure 1.16 Top Apron

Figure 1.17 Rolling Guider

Features:

The outer layer of apron offers excellent resistance to abrasion. It offers high degree of ozone resistance and also resistance to damage due to dyes, chemicals and other spinning additives. Thesmooth surface finish enables proper fibre control.

Conclusion:

I have worked on the maintenance of the spinning or ring frame machine. In order to bring transparency in the maintenance process and to make it systematic a maintenance job for each production department or section is to be prepared.

We can conclude that by maintaining equipment and machineries well, industries can consistently deliver effective outputs.

The maintenance store is responsible for looking after the spare parts and maintains the records of the maintenance department. The store of maintenance department issues different spare parts, needle and keep the records.

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