Study of blow room and card cleaning efficiencies for modern processing lines

BS Honors (Textile Engineering)

Session 2009-2013

Project Advisor

Mr. Naveed Akkhtar

Submitted By

Ahmad Nasir	091420288
Ghulam Yaseen	091420263
Mudasir Mehdi	091420183
M. Irfan	091420178
Usman Sheikh	091420118

School of Textile and Design

University of Management and Technology
Lahore, Pakistan

Study of blow room and card cleaning efficiencies for modern processing lines

A Final Year Project report submitted to

School of Textile and Design

In partial fulfillment of the requirements for the degree

Bachelor of Science (Honors) In Textile Engineering

By

Ahmad Nasir

Ghulam Yaseen

Mudasir Mehdi

M. Irfan

Usman Sheikh

University of Management and Technology

September, 2013

ACKNOWLEDGEMENT

All the praises are for the almighty, Allah who bestowed me with the ability and potential to complete this project.

Words are very few to express enormous humble obligations to my affectionate Parents for their prayers and strong determination to enabling me to achieve this job.

I take this opportunity to record my deep sense of gratitude and appreciation to my project Advisor**Mr. Naveed Akhtar, School of Textile&Design, U.M.T Lahore** for his constant encouragement and inspiring guidance with his Wisdom. at all times to enable us to work on this project His support, encouragement, and guidance have been invaluable in the successful completion of this project report. He has been most patient and helpful all through in all our endeavors to learn more during our project work. I also want to thank

Dr. NABEEL AMEEN Director School of Textile and Design.

We are also thankful to our families for being beside us and encouraging us in all that we have been doing. We thank UMT for educating us in various ways, and for providing me with the good education there is. We would like to take the opportunity to thank the faculty and staff for helping us prepare for a life after graduation. Not everyone is so fortunate. We know we still have much to learn, but with continued support and encouragement from people like you we know we can accomplish a great deal. We have learnt new things all along the process and we thank everyone for their support and advice.

Abstract

The Blow room plays an important role in the opening, cleaning, homogeneous mixing and blending, optimum process parameters are required to minimize/control the fiber rupture and lower the neps generation. Material transportation to chute for sub sequent process is also carried out while blow room is in action. The main object of this study is to achieve better sliver and yarn quality by implementing different settings at different machines. The blow room contributes only about 5 to 10% to production costs in the ring spinning mill.

Cotton cleaning is an important spinning preparation process, and the degree of cleaning is therefore an interesting characteristic for the machine employed in this field. On the basis of the authors' research, they state that the determination of the clean ability based on the measures of trash by means of the device of control “Uster" permits to predict the future behavior of cotton in cleaning and gives a preview on the cleaning efficiency of cleaner and even a cleaning line. This means that it is possible to test cotton fibers at all stages of the cleaning process.

The clean ability of cotton is clearly influenced by several fiber properties. We can notice that the clean ability strongly depends on the seed coat fragments and the micronaire value but does not depend on the trash content. So the determination of C allows to compare the effect of cleaning lines on the decrease and the fragmentation of trash and to evaluate the cleaning efficiency.

Table of Contents

Chapter 1

Introduction

In this project study we are going to compare the cleaning efficiencies of old and modern blow room and card machine. It is possible to analyze the cleaning efficiency of machines during the blow room and the carding at reasonable times and with little staff in order to compare their function status for a better summarize. Because of Raw cotton contains various kinds of trash such as leaf, bark and seed coat particles. The content of each of those trash categories is highly depending on the origin of the cotton and its harvesting method. Trash content from bale to silver should decrease through the opening. The requirements of sliver quality impose that the cotton must be intensively cleaned during ginning, spinning mill and carding. On the other hand the amount of those contaminations provides useful information for finding more efficient cleaning processes and predicts the quality of the finished products.

Objectives of Project

It is most important process for spinning mill to enhance the quality of end product (yarn). In Pakistan normally we are using old machinery which is not using full to remove the waste from the raw material. So, the purpose of our project is to remove the lot of waste from the raw material by old and modern blow room and card machine. There are following objectives of our project

- Improve Quality and Production
- Reduce waste percentage during processing material in the yarn manufacturing
- Reduce cost of end product
- Achieve better Quality of yarn
- Achieve customer Satisfaction

Degree of cleaning (DC)

The numerical evaluation of the cleaning effect of a machine in spinning preparation is generally effected by detailing the degree of cleaning which indicates in percentage terms the quantity of trash removal relative to the trash content present in the feed material. The result of the cleaning defined by degree of cleaning (DC). The degree of cleaning can be classified as follows

Degree of cleaning efficiency for the blow room

Class	Interpretation
> 40%	Very good
30% - 40%	Good
20% - 30%	Average
10% - 20%	Bad
< 10%	Very bad

Degree of cleaning efficiency for the card

Class	Interpretation
> 90%	Very good
80% - 90%	Good
70% - 80%	Average
60% - 70%	Bad
< 60%	Very bad

The degree of cleaning is influenced not only by the lint characteristics in intermediate products but also by the mechanical handling of the fiber because cotton has a lower degree of cleaning DC (%) if it is difficult to clean (bad clean ability) or if the machine has a lower cleaning efficiency. However the degree of cleaning DC (%) is improved when the cotton is easy to clean (good clean ability) or when the cleaning efficiency of the machine is improved. Another important factor is the trash content (Total %) of the cotton at the input of machine the degree of cleaning for dirty cotton is more important than clean cotton on the same machine and in the same conditions.

Clean ability (C)

It is quite possible that cotton which has high trash content possesses a good or a bad clean ability. It is the same for cotton of low trash content. Different trash categories may have

different influences on textile processing of cotton and on the quality of the finished products. The seed coat fragments SCF are virtually impossible to extract from the bulk of raw cotton because of the tuft of fibers attached generally incorporated into the yarn as a neps. These tests confirm that the C factor depends largely on the content of small seed coat fragments. Therefore an increase of seed coat fragments (SCF) in raw material is also associated to the cotton cleaning difficulty. So, the smooth leaf needs only gentle cleaning at the mill but the hairy leaf cotton needs much more aggressive cleaning to remove the hairy leaf particles which tend to attach to the cotton fibers. It indicated that seed coat fragments were the main reason for end breaks deposits in rotors increased neps and other problems. The effect of seed coat fragments (SCF) particles has increased significantly in the cotton industry because the demand for improving fabric quality has increased. In general the lint cleaning considerably decreases the weight of fragments in lint but only slightly affects their number. This indicates that lint cleaners in addition to removing fragments may create new seed coat fragments by breaking up some of those present. It is important to understand that the presence of a large number of seed coat fragments in a cotton for instance due to excessive cleaning will exert a negative effect on the clean ability of the cotton because these small fragments are more difficult to remove. This implies that the majority of small imperfections found in yarn are actually due to the presence of seed coat fragments. Cleaning lines in spinning mills should be compared to make sure that each piece of equipment is operating efficiently. It is possible that two cleaning lines coming from the same lay down have different cleaning efficiencies. Certain pieces of equipment may not be adjusted correctly so that the cleaning is not optimized.

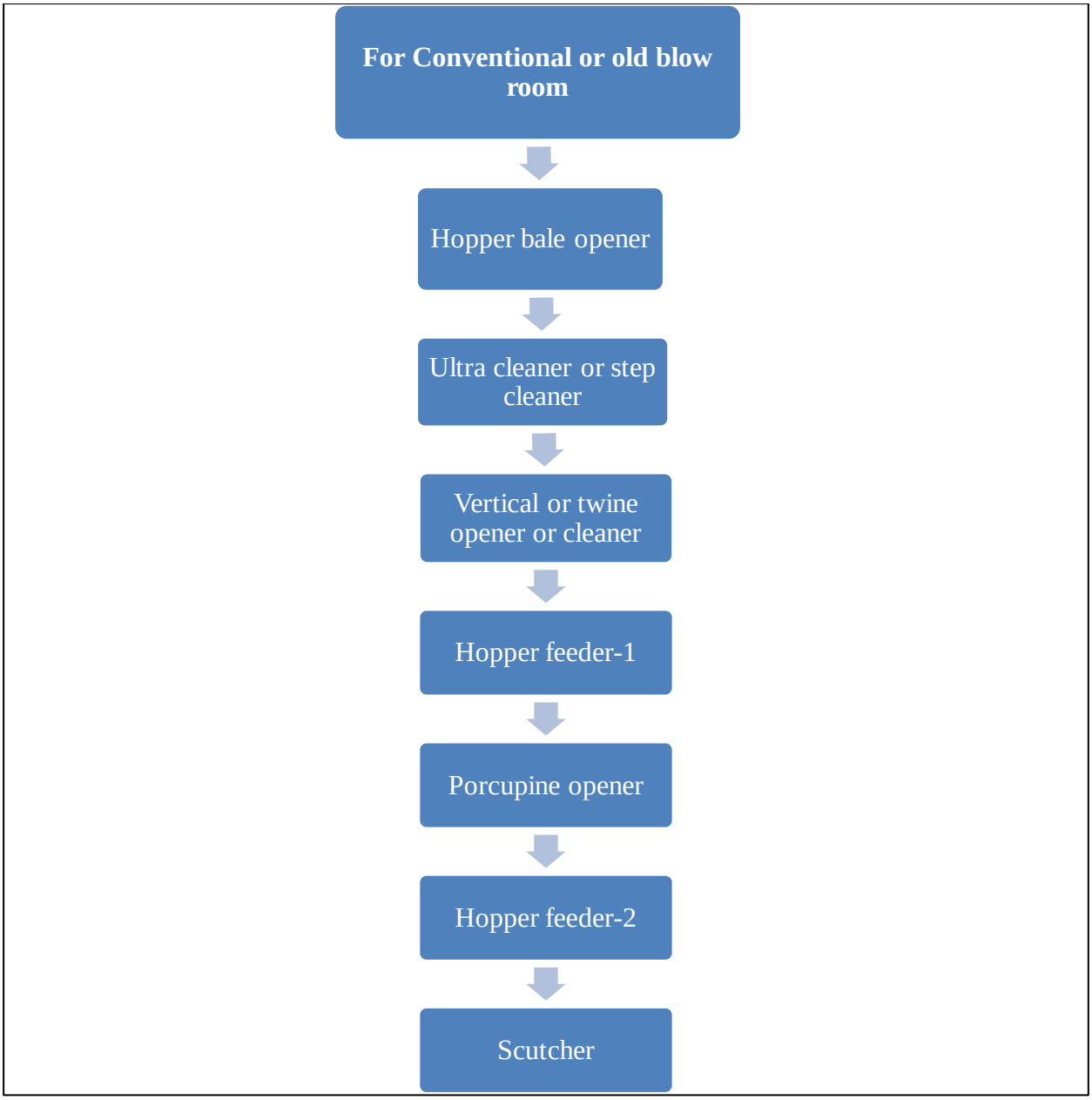
Influence of clean ability

Cotton cleaning is an important spinning preparation process and the degree of cleaning is therefore an interesting characteristic for the machine employed in this field. The clean ability of cotton is clearly influenced by several fiber properties. We can notice that the clean ability strongly depends on the seed coat fragments and the micronaire value but does not depend on the trash content. So the determination of C allows to compare the effect of cleaning lines on the decrease and the fragmentation of trash and to evaluate the cleaning efficiency. Besides it is possible to examine the cleaning efficiency of machines during the blow room and the carding at

reasonable times and with little employees in order to compare their function status for a better follow up.

Therefore information about cotton trash categories prior to textile processing is important. It helps to find efficient ways to remove trash particles at the early stages of processing to avoid large particles being broken into small trash (seed coat fragment) which are difficult to remove from cotton. Despite technology exact mechanical processing remains a necessity in order to successfully open and clean because the removal of impurities is usually accompanied by shortening of the length distribution fiber loss formation of neps, fiber breaking and other damages. Therefore all mechanical processing is a compromise between quality improvement (disentanglement and cleaning of fibers) and damage which is defined as degradations of fiber's quality. This is necessary in order to establish a spinning mill's standard data. At the same time it would be interesting to analyze the changes of trash size and the cleaning efficiency for the successive spinning process machines. To value a global efficiency it is necessary to take into account also other indicators of quality such as variation of the neps rate and the physical properties (tenacity, short fiber count and length).

Flow Chart of Blow Room




For modern blow room
Bale plucker
Metal detector
Uniclean
Unimix
Uni flex
Vision shield
Condenser
Chute feed
Carding