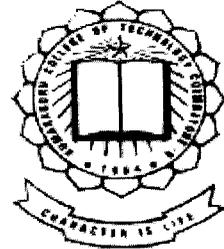# STUDY OF CARDING PERFORMANCE OF A REVOLVING FLAT CARD WITH IMPROVED TRANSFER FACTOR OF ONE

By

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A PROJECT REPORT
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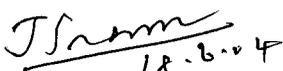Of

MASTER OF TECHNOLOGY

IN

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BONAFIDE CERTIFICATE

Certified that this project report titled "STUDY OF CARDING PERFORMANCE OF A REVOLVING FLAT CARD WITH IMPROVED TRANSFER FACTOR OF ONE" is the bonafide work of Mr.S.Mohan raj who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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ABSTRACT

The project work is confined to investigate the effect of the carding performance of a revolving flat card with an improved transfer factor of one.

The Pneumatic doffing arrangement is developed and attached in the existing carding machine at the right side of the front plate. Thereby a portion of the material form the cylinder is doffed pneumatically and remaining portion by the existing mechanical doffer.

Cotton lap with a hank of 0.0016 is used and the setting is kept same throughout the experiment, six-centimeter water column suction pressure is used for doffing in the pneumatic doffing arrangement.

In the first stage the fiber doffed is collected in the suction device itself, but in the second stage the material is doffed and it is delivered as web. Dyed cotton tuft is used to find the fiber individualization. It is observed that the opening of fiber tuft is optimal and the parameters such as neps and trash content are influenced when the transfer factor is increased to one.

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CHAPTER 1

INTRODUCTION

In spinning mill there are number of factors on which its profitability is dependent. The very efficiency and performance are also a function of yarn quality and final count of yarn.

Carding is the most important operation in spinning of stable fiber yarns. Over the last thirty years, numerous developments have been taken place in the card to improve the quality. The doffer, cylinder and flats which plays important role in the revolving flat card, whereas the doffer action expressed in terms of its collecting power has been explained by studies on the recycling of the fiber on the cylinder.

Under steady state condition, the card builds up a store of fiber on the cylinder called the operational layer, from which a fraction is being transferred to the doffer and the same amount of fiber replenished from the taker-in.

Present transfer factor of the carding machine range 0.1 to 0.5 between the cylinders to doffer. This makes the fiber gets carded repeatedly between the cylinder and the flats that might deteriorate the quality of the fiber.

Development considered in this project is to achieve a transfer factor of one between cylinder and doffer with low speed and high rate of production.

In the context of for reaching changes tacking place in the Indian textile industry today and in the work of labialisation policies and globalization, the direction

and management of spinning mills should also acquire a fresh dynamism. For, otherwise it will be difficult for a spinning mill to successfully respond to the fast changing scenario and this system of pneumatic doffing can also be acquired as a fresh dynamism, for quality requirement of yarn.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Origin of carding:

In older days cotton was carded by means of hand card, which Consists of two flat surfaces covered with upright teeth, which was practiced for many centuries and was the only method known till the 18th century.

Daniel Bown discovered the first carding machine in the year 1748. The machine consisted of four roller of the same diameter with wire teeth. The first basic change from the movable card with its swing motion was the substitution of a cylinder turned with a crank.

Lewis Paul, Birimingham, England, brought out the invention of revolving cylinder at about 1788. James Hargreaves the "father of Spinning Jenny" invented a card consisting of two cylinders with different surface speed and hence the card of his make is called as the "Parent of modern card".

Ridhard Arkwright, the inventor of water wheel has a source of power, build a stripper, which was a continuous method of removing cotton from the card, which is firmly called as the doffer comb.

During 1800 – 1830, the carding machine was hardly needed because of the growth of cotton and the need of yarn, more. How ever, essential changes excepting the revolving flats have now been completed and the card of 1830 resembles the

modern card. This card of a century ago had the characteristics cylinder and flats for the carding duty, the continuous feeding of a lap, continuous doffing, and the formation of characteristic sliver. The coiler to receive sliver was devised by David Cheetam.

The Breaker card (input lap) was nothing but the package was in the lap form. While, in the finisher card (input – breaker sliver), the package was in the form of cans i.e. the sliver is beard in the can. Hence both are used.

The roller-carding machine was used for coarser counts. The machine of extensive use, both for single carding and as a breaker in double carding was the unioncard. Then Auchibald Buchanan introduced the self-stripping flat in 1823. George Wellman, of Lowell, USA, devised the self-stripping mechanism. In 1834 James Smith, of Deasston, Scotland, introduced a self-stripping carding machine with revolving flats.

After some years, the traditional revolving flat card was introduced with different dimensions.

Then, the top flat card replaced these cards. The cards made of different companies are much alike in principle, although they differ slightly in adjustments, in the ways in which the settings are made.

Then came the introduction of High speed carding machine in which the cylinder speed in increased, and finer sliver and more production were achieved. Hence these high production cards were used in many of the mills and hence the research continues.

2.2 Carding:

Carding is the operation of treating fibres, between large metallic brushes, which thoroughly opens the cotton, frees it from most of the remaining dirt, and neps, removes some of the short fiber, straightens the fibre and condenses the fibers to a sliver.

It may also be defined as the process of an entangled mass of fibres to a filmy web by working between two closely spaced, relatively moving surfaces clothed with short wire points.

The importance of good carding has been well justified by the comment, "Well card is half spun".

2.3 Object of carding:

Like all the preceding operations of cleaning, carding opens and cleans simultaneously, as the cotton is opened. Opening in the card consists in separating the tufts of the lap into small tufts or even in to individual fibres. The completeness of the opening done in the card may be judged by the uniformity of the web at the front of the card. So, the main objects are,

- The fiber to fiber separation
- To effect a thorough mixing of fibres.
- Removal of trash in the lap or opened cotton in the blow room process in to sliver form suitable for further processing.
- Conversion of lap or opened cotton in the blow room process in to sliver form suitable for the processing.

The principle object of the carding process is to reduce the raw material to a state of greatest possible sub-divisions by working between two wired surfaces.

2.4 Carding action:

Carding action is that used to continue the opening of the cotton that is separating one fiber from another. This action is obtained by having one surface of card clothing above the other. The integrity of carding action depends upon the following points,

- o The arrangement of density of wire points.
- o The setting between wire points.
- o The relative surface speed of the wire clothed surfaces.

2.4.1 Tuft Size Reduction/Individualization:

The main work of the carding, separation to individual fiber is done between the main cylinder and the flats. Only by means of fiber separation, it is possible to eliminate the fine dust particles and dust. Attempts have made to propose a quantitative analysis of the relation between the productivity and the degree of opening, which is closely related to the arrangement of carding points and the operating conditions of a card. The following two assumptions were made to solve the problem easily (C.A.Lawrence, A.Dehghani, M.Mahmoudi, B.Green Wood &C.Lype November 2000).

1. A fiber tuft reaching a carding point is simply divided in to two small tufts so that the proportion in the weight of these tufts is equal to the value of the transfer coefficient.

2.   The degree of opening of web can be estimated by the main value of logarithm of reciprocals of the weight of delivery tuft.

The tuft opening on a card is performed by the repeated action of carding point on tufts. Thus, for better opening to separate a tuft into each fiber, it is necessary to increase first the number of action a tuft receives at carding point before it is transferred to the doffer. On the other hand, this is liable to deteriorate the quality of a web.

The taker-in has effectively a combing action, which results in the breakdown of the tufts, constituting the fed fiber mass, into single fibers and smaller tufts. To effectively breakdown the fiber mass into tuff lets with minimal fiber breakage, the taker in wire points should be coarse. It is reasonable to assume that the smaller the tuftlet size and the greater the mass ratio of individual fiber to tuftlets, the better the cleaning action of the taker-in.

It was found that the total number of tuftlets decreases for closer feed plate setting, lower feed rate, smaller steeper rate of the saw tooth clothing and higher licker-in speed. Since the licker in opens the batt into both tuftlets and individual fibers, a decrease in the total number of tuftlets suggests an increase in the mass of individual fibers; a decrease in the total number of tuftlets suggests an increase in the individual fibers.

The flats and the cylinder play a major role in the fiber individualization. It may be reasoned that the number of flats involved in separating a tuftlet depends on the tuftlet size, the mass flow rate and the flat setting. Large tuftlets will be pressed into the cylinder wire during the carding action, whereas small tuftlets will be more easily carded and will remain at the top of the cylinder wire teeth. The larger the tuftlet, the higher the production rate and the closer the flat settings, the greater the number

flats involved in the separation of a given tuftlet (Hiraku takeda and hiroyuki ogawa Aug/oct- 1973).

2.4.2 Process Of Individualization In Carding:

1.   Fiber transferred from cylinder to flat and retransferred from flat to cylinder – Gradual reduction in tuft size.

2.   Higher cylinder speed compared to flats.

2.4.3 Mechanism Of Fiber Individualization:

In the carding zone, it is the interaction of the fiber mass and the wire-teeth clothing of cylinder and flats that fully individualizes the fibres and gives parallelism to the fiber mass flow. In considering how fibres enter and are individualized in the carding zone. Oxley suggests that tuftlets are not strongly held on the cylinder clothing because the tooth angle faces the direction of cylinder rotation.

Debar and Watson's experiments of the movement of radioactive tracer fibers through a miniature card showed that some fibres caught by the flats were often only removed by the cylinder-wire clothing after many revolution of the cylinder. This action causes the top to hang from the flats and to contact subsequent parts of the cylinder wire surface resulting in the second action which is combing, where the wire clothing of the cylinder hooks single or a small group of fibres and combs them from the top layer. A second flat catches the bottom layer on the cylinder and the actions are repeated. In this way tuftlets or groups of fibres are separated into individual fibres (C.A.Lawrence, A.Dehghani, M.Mahmoudi, B.Green Wood &C.Lype November 2000).

By making abrupt changes in the colour of the fiber mass fed to the card, oxley demonstrated that tuftlets from the load on a given flat are carried forward by the cylinder clothing and separated into individual fibres over a small number of preceding flats, typically 4. It was concluded that the interchange of fibres between cylinder and flats does not occur over the full carding zone. Sengupta made measurements of the carding/combing forces and showed that essentially these actions were on average confined to the first ten working flats.

Here it encounters the fiber layer being transported on the cylinder surface from the taker-in. the flat receives a sudden addition of fiber mass to become fully loaded, and, in agreement with other results, the load weighs more than for the forward direction of motion.

2.4.4 Operational Layer/Transfer Coefficient:

The sequence of events as fibres on the cylinder approach the doffer can be described as follows:

The fiber layer carried to the doffer will be split up into two parts. If the doffer splits away and retains say ½ of the layer this will pass out from the card. The remaining half remains on the cylinder and after about half a revolution will be joined by a new unit feed "quantity" of fiber transferred to it by the feed roll/licker- in assembly. These fibres are more or less individualized by the time they reach the doffer.

Let us call the splitting and retaining power of the doffer the transfer 'coefficient"(TC). Thus, if the total volume of fibres were to be retained by a doffer, its TC would be 1; if only half of the fibres were retained, the TC would be 0.5; if only one quarter of the fibres were retained, the TC would be 0.25 and so on.

Let it be assumed that for one revolution of the doffer the quantity of fibres fed into the card is equal to "a". If the TC of the doffer is 'k', in one revolution it has retained fibres of quantity 'a.k', leaving a quantity a×(1-k) on the cylinder. During the following revolution of the doffer the cylinder receivers again a quantity of fibres equal to 'a'. At its second revolution therefore the fibres on the cylinder represent a quantity a+a (1-k) from which the doffer splits away (a+a (1-k)) k leaving (a+a (1-k)(1-k) on the cylinder. Then the quantity of retained fibres on the cylinder goes on increasing until a limit is reached, the cylinder is saturate and the fiber distribution on the card is in equilibrium.

The total load 'S' on the cylinder after 'n' revolutions of the doffer is:

$$S_n = a (1+(1-k)+(1-k^2)+(1-k))$$

If the transfer coefficient is 0.5, the original tuft is divided into equal small parts weighing to proportional to 0.5^n by n division and the opening effect can be estimated by n, providing that a unit value is assigned to the effect by one division. In addition the further transfer coefficient deviates from 0.5, the more irregular the weight of divided tuft, resulting in the low opening effect.

The percent n fiber transferred from the cylinder to the doffer decreases with the increase in the loading of the cylinder card clothing and vice-versa. This dependence of the transfer coefficient on the magnitude of the cylinder-loading act as an additional factor in the equalization of the sliver on the card.

2.4.5 Estimation Of Operational Layer:

The amount of Q (operational layer) can be determined as follows. When the card has attained a steady state condition the doffer is stopped and the feed and the drive to the flats are also put off. The doffer is started again. At first the fiber between

the doffer comb and the junction of the cylinder and doffer come out and then the fiber from the cylinder are transferred to the doffer. There is a clear dividing line between the two. If the doffer is kept running for three to four minutes, it will cease to deliver any more fiber. The weight of fiber from the dividing line to the cessation of fiber delivered can be taken to be an approximate estimate of Q. It may be noted that unless the flats are disconnected and taken off q as determined by this method may be affected to some extent by the interchange of fiber between the cylinder and flats. Q may also contain some fiber transferred from the layer of fiber on the doffer, if any (G.C.Ghosh And S.N.Bhaduria, 1965).

2.4.6 Stripping action:

Stripping action (point to point action) tack place between the faster moving surfaces to slower moving surface. The surface, which moves faster, will strip the fibers from the slower moving surface.

2.5 Carding Forces:

The carding force between the cylinder and the flats has been studied with the help of a force transducer. It is observed that the carding force reduces progressively along its position on the flexible bend till the 15th flat position after which it reminds constant. The reduction in carding forces is linear up to the 7th flat position. The effect of sliver hank, doffer speed, cylinder speed, cylinder flat setting and the type of flat clothing on the mean clothing has been studied,(A.K.Sengupta, N.Vijay Araghavan And A.Singla sep.1983).

carding force vs flat lcation

(Y-axis: carding force, g — values 0 to 6; X-axis: flat location — values 1, 3, 5, 7, 9, 11, 13, 15, 17, 19)
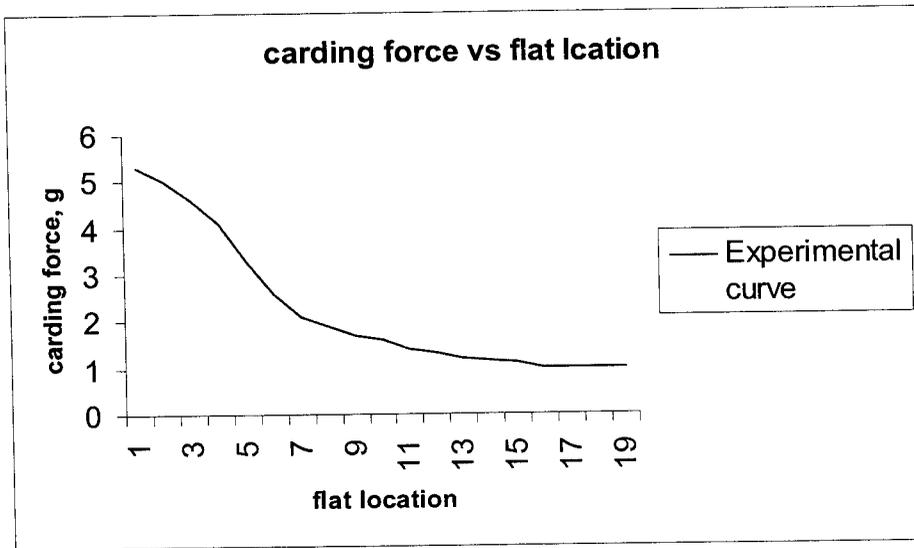
—— Experimental curve

Chart – Carding force vs Flat location

The dependence of the carding force on these parameters has been explained on the basic of the extent of pre opening prior to carding, loading of fibres on the operation layer of the cylinder and the interaction among the wire surface. The effect of doffer speed cylinder speed ion the carding force is shown in the table.

- A greater pre opening of the feedstock prior to carding reduces the carding force.
- Increase in the load on the operation layer of the cylinder at constant cylinder speed increases the carding force. The relation-ship is linear.
- Increase in the cylinder speed increases the carding force though the load on the operation layer is decreased.
- Increase in the cylinder flat setting decreases the carding force. The relation-ship is linear but inverse

The wire point density, wire point profile, wire point height and angle influence

2.6 Hook Formation

2.6.1 Mechanism of hook formation:

Generally, hooks are formed on the cylinder, and during transference to the doffer. It is observed that the majority of fibres change their configuration during transfer. Hooks are formed and previously formed hooks are removed. Transfer of fibers takes place with or without reversal of ends, so that the number of leading and trailing hooks on the cylinder wire are nearly equal or have the same order of trailing and the leading hooks, respectively, on the doffer. Those fibers that transfer without reversal will changes their configurations more. More than half the fibers reverse their direction during transfer from cylinder to doffer, (G.V.Dzhokharidze 1966).

A disadvantage of web formation at the card is the formation of hooks. According to an investigation it can be assumed that.

1. 50% of the fibres have trailing hooks

2. 15% have leading hooks

3. 15% have both ends hooked

4. 20% without hooks

Leading hooks must be presented to the comber and trailing hooks to the ring spinning frame. Therefore, there must be even number of passage between card and the comber and odd number of passage between the card and the ring frame.

Ends leading in the cylinder	Ends leading in the web		Ends trailing in the web	
	Hooked	Straight	Hooked	Straight
Hooked 30	8	8	10	4
Straight 14	3	3	5	3
Total 44	11	11	15	7
Ends trailing in the cylinder	Ends trailing in the web		Ends leading in the web	
	Hooked	Straight	Hooked	Straight
Hooked 4	—	2	2	—
Straight 40	15	6	6	13
Total 44	15	8	8	13

Table I. transfer of fiber from cylinder to doffer.

2.6.2 Trailing Hook In The Web:

From the table I, it may be observed that out of 30 trailing hooks in the web, 10 originated from leading hooks on the cylinder that reversed during transfer, 5 originated from leading straight ends on cylinder that reversed and also got hooked in the trailing direction, and 15 originated from trailing straight ends on the cylinder that got hooked during transfer, thus 20 out of 30 trailing hooks found in the web are formed during transfer.

2.6.3 Leading Hooks In The Web:

Out of 19 leading hooks found on the doffer, 2 originated from trailing hooks on the cylinder that reversed during transfer, 6 originated from trailing straight ends on the cylinder that reversed during transfer and got hooked in the leading direction, 8 were originally leading hooks on the cylinder that got transferred without reversal, and 3 were leading straight ends on the cylinder that got hooked in the leading end during transfer and transferred without reversal.

Thus 9 out of 19 leading hooks in the web were originally straight ends that got hooked in the leading direction during transfer from the cylinder to the doffer. A possible mechanism for the formation of leading hooks during transfer from cylinder to doffer is suggested below, (A.K.Sengupta &R.Chattopadhyay, September.1988).

2.6.4 Mechanism Of The Formation Of Leading Hooks:

It is postulated that buckling of the front end of a fiber causes the formation of a leading hook on the doffer during transference. When the front end of a fiber moving with the velocity of the cylinder comes in contact with the relatively slower moving doffer surface, it gets transferred without reversal. When the conditions for buckling of front ends are satisfied, the probability of a fiber transferring from the cylinder to the doffer without reversal of ends would depend largely on the nature and extent of positive control exercised by the cylinder on the rest of the fiber.

2.6.5 Influence Of Carding Variables On The Pattern Of Hook Formation:

The increase in the ratio of cylinder to doffer speed causes an increase in the trailing hook, while a decrease in this ratio brought about by increasing the doffer speed causes an increase in the leading hooks.

It needs to be appreciated that a considerable proportion of the fibers change their configuration during transfer from the cylinder to the doffer. Hooks are formed, and previously formed hooks are removed. Hooked fibers are also transferred from the cylinder with or without reversal and with or without change in configuration.

Therefore, the number or the percentage of leading or trailing hooks in the web would depend on the balance of the following three factors: a) number of fibers with hooks transferred from the cylinder to the doffer with or without reversal; b) number of straight ends hooked during transfer and transferred with or without reversal; and c) number of hooked ends straightened out due to carding action between the cylinder land the doffer. The magnitudes of a, b, and c and, hence, the number of hooks – are likely to be influenced by fiber, process, and machine factors. The extent of disproportionality between major and minor hooks would, thus, change with different carding conditions, but it is unlikely that the type of change in fiber configuration or the mechanism of hook formation will be influenced by the carding variables.

An increase in the fiber length increases the percentage of hooks, the increase being higher for leading hooks. An increase in fiber denier increase trailing hooks but decreases leading hooks. The frictional characteristics of fiber appear to influence the incidence of hook formation, (A.K.Sengupta &R.Chattopadhyay, September.1988).

2.6.6 Estimation Of Hooks:

1. Direct (or) visual
2. Indirect (or) Lindsey's method

2.6.6.1 Visual Method:

Fibres dyed with Trinopal KVM and Trinopal WSM was used as tracer fibres for viscose and polyester respectively. The tracers were mixed with untreated fibers prior to carding. Following carding, tracers were examined under ultraviolet light to study the pattern of hook formation.

2.6.6.2 Lindslay's Method:

In the modified Lindsley's method, the two parameters chosen to represent the pattern of hook formation were the proportion of curved fiber ends P and % E which are represented by the following relationships:

$$P \ = \ \frac{E}{E \times N} \ \times 100$$

$$\% \ P \ = \ \frac{E}{C \times E \times N} \ \times 100$$

When C is the weight of combed out fibers; E, the weight of fiber ends projecting over the line of cut after combing; and N the weight of the sliver portion clamped under the cutting plate after combing, (A.K.Sengupta &R.Chattopadhyay, September.1988).

2.7 Cylinder/Doffer Interaction:

Varga reports that the action of fiber mass transfer to the doffer is similar to the transfer at the input to the cylinder-flats zone. The regions above and below the line of closest approach of the cylinder to the doffer (i.e. the setting line) are

important to the mechanism of fiber mass transfer and the transfer coefficient. The two regions may be termed the top and bottom co-operation are top and bottom zones.

Ghosh and Bhaduri showed that the method of removing the web from the doffer does not influence the propensity of any class of configuration. It is the mechanism of transfer that is seen as principally responsible for the shape fibres have in the sliver.

Ghosh and Bhaduri report that tracer fibers were noted generally to go around with the cylinder for several revolutions before being transferred by the doffer. On occasions transfer only happened when the cylinder speed was increased.

Debar and Watson's work with radioactive viscose tracer fibres showed that a fiber on the cylinder wire passes the doffer up to a maximum 20 times before being removed by the doffer, sometimes interchanging several times between the cylinder and flats, during the 20 revolutions on the cylinder. Hodgson found that cotton fibres make between 10 and 25 revolutions cylinder revolutions before being removed by the doffer. With the continuity of fiber mass flow through the card, this means that the doffer web is built up over many cylinder revolutions and that the recycling layer, Q_2, is comprised of multiple fractional layers of the fiber mass transferred from taker-in to cylinder during these cylinder revolutions.

Much of the research on the cylinder/doffer interaction concerns the effect of machine variables on the size of Q_2 (of the operational layer, Q_o), on the web quality and changes to the relative proportions of the classified configurations, and on ultimately the yarn quality. Sing and Swani developed a Markovian model for the carding process in order to determine the probabilities of fiber transfer between cylinder and flats and cylinder and doffer, taking into account the recycling of fibres.

It was shown that the times spent by a fiber on the cylinder, Tr, and in the flats/cylinder region, Td, are given by:

Tr =1 / K and Td = Tr. Pf. ....(1)

Where K = Q1 /Qo and Pf =Qf /Qo

Reported values for K would seem to vary between 0.2% to 20%, depending on doffer and cylinder speeds, on the relative profiles of the saw-tooth wire clothing, and on the sliver count. Simpson suggests that fiber properties are also of importance, in that there is a tendency for low micronaire cottons to give higher cylinder loading and for fibres with low shear friction and good compression recovery to result in higher K values. No physical explanations are given for these findings and no other studies are reported on the effect of fiber properties.

Kaufman reports that the lighter the fiber load is on the flats, the better the carding quality. Thus, the use of Pf does not give adequate understanding of the importance of the recycling layer or of the size of the fiber mass load at the cylinder/flats interface, (C.A.Lawrence, A.Dehghani, M.Mahmoudi, B.Green Wood &C.Lype, November 2000).

2.8 Back ground of the problem:

- $T_c < 1 =$ differential treatment of fibers.

- The carding forces between the cylinder and the flats have been studied with the help of a force transducer. It is observed that the carding force reduces progressively along its position on the flexible bend till the 15th flat position after which it remains constant. The reduction in the carding forces is linear up to the 7th flat position.

- Operational layer reduces the efficiency of the carding.

CHAPTER 3

RESEARCH OBJECTIVE

- To design a pneumatic doffing arrangement for the carding machine.
- To replace the mechanical doffer by the pneumatic doffing.
- To achieve the transfer co-efficient of one.
- To eliminate the operational layer on the cylinder.
- To improve the overall efficiency of the carding machine
- To study the carding performance of a revolving flat card with an improved transfer factor of one.

CHAPTER 4

METHODOLOGY

4.1 Introduction:

In the normal carding, mechanical doffing is being used, in which the material transferred are not uniformly treated I.e. some material moves along for more than one revolutions of the cylinder. Therefore achieving TC=1 by this mechanical doffing is difficult. In this project doffer was eliminated and an arrangement (pneumatic doffing) to achieve TC=1 was made at the front plate of the cylinder.
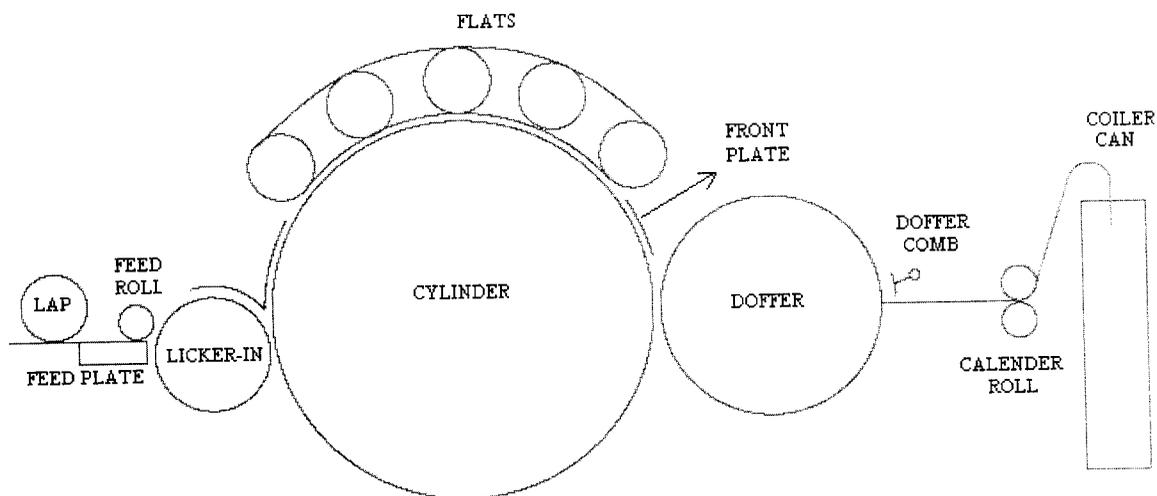
Figure-4.1. Material passage in a normal carding having mechanical doffer.
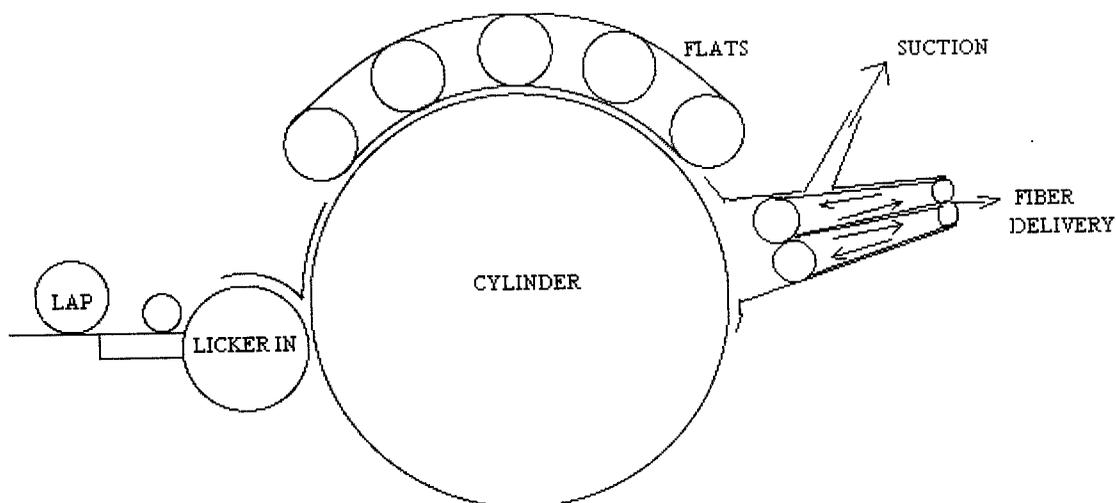
Figure-4.2. Material passage in card having pneumatic doffing

4.2 Experimental set up:

4.2.1 Step1:

Slit was made in the front plate of the cylinder of the carding machine. Having dimension of length of 4" and height of 1".

And a trumpet shaped funnel is fixed over the slit. Which is connected through the pipe to the suction devise. In this arrangement the fiber is collected and condensed in the suction devise itself.
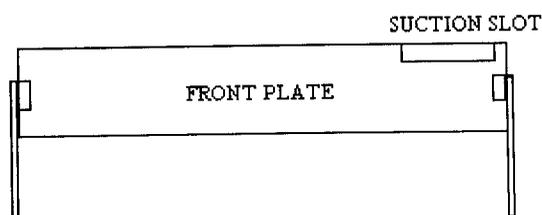

Figure-4.3. Position of suction arrangement in front plate

4.2.2 Step2:

We use the same slit as in the step1 in the front plate this mechanism consists of the following parts.

Ate arrangement consists of

1   perforated drum
1   Rubber roller
2   Apron
3   Condensing tube.

The drive is given to the perforated drum with the frictional contact of it the apron rotates, which doff the fiber in the front of the unit.
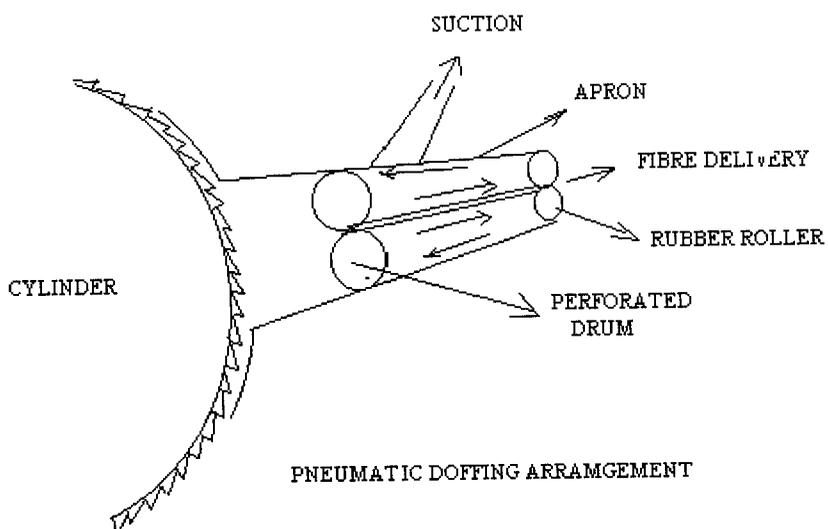
SUCTION

APRON

FIBRE DELIv£RY

RUBBER ROLLER

CYLINDER

PERFORATED
DRUM

PNEUMATIC DOFFING ARRAMGEMENT

Figure-4.4. Arrangement of pneumatic doffing

The drive is given to the perforated roller in opposite direction where the aprons come in frictional contact and also drive the rubber rollers.

- 6 cm water column suction pressure is used for pneumatic Doffing

4.3 Processing Details:

4.3.1 Feed material particulars:

Fiber   = cotton

Lap hank   = 0.0016

Lap weight   = 18kg

Mixing   =20's mix

Lap trash   = 1.8%
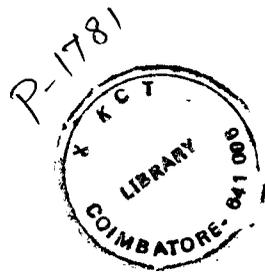
4.3.2 Carding machine particulars:

Make   =Platts brothers.

Model   =S.H.P.Card.

Year   =1919.

Width   =40"

Total draft =94

CHAPTER 5

CONCLUSION

When transfer coefficient is increased to one there is some improvement in carding quality as judged by the nepness of the web. It is also found the mcronaire value of nep is reduced.

As the transfer coefficient is increased to one, number of revolution that the fibre taking round the cylinder is less so the fiber rupture is reduced.

As the doffing is not mechanical (stripping action) the hook formation is influenced

By using the tracer fiber technique it is observed that the opening of the tuft is optimal

Operational layer eliminated, hence the efficiency improves, further work is therefore still needed in this area.
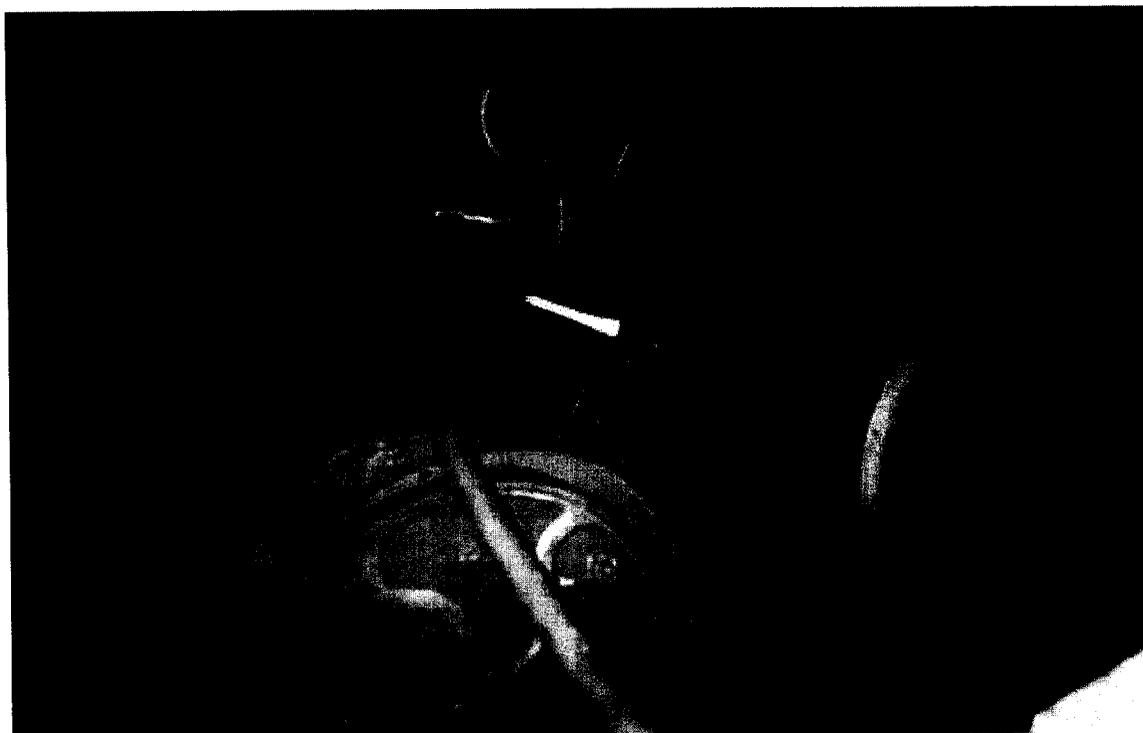
CHAPTER 6

APPENDIX
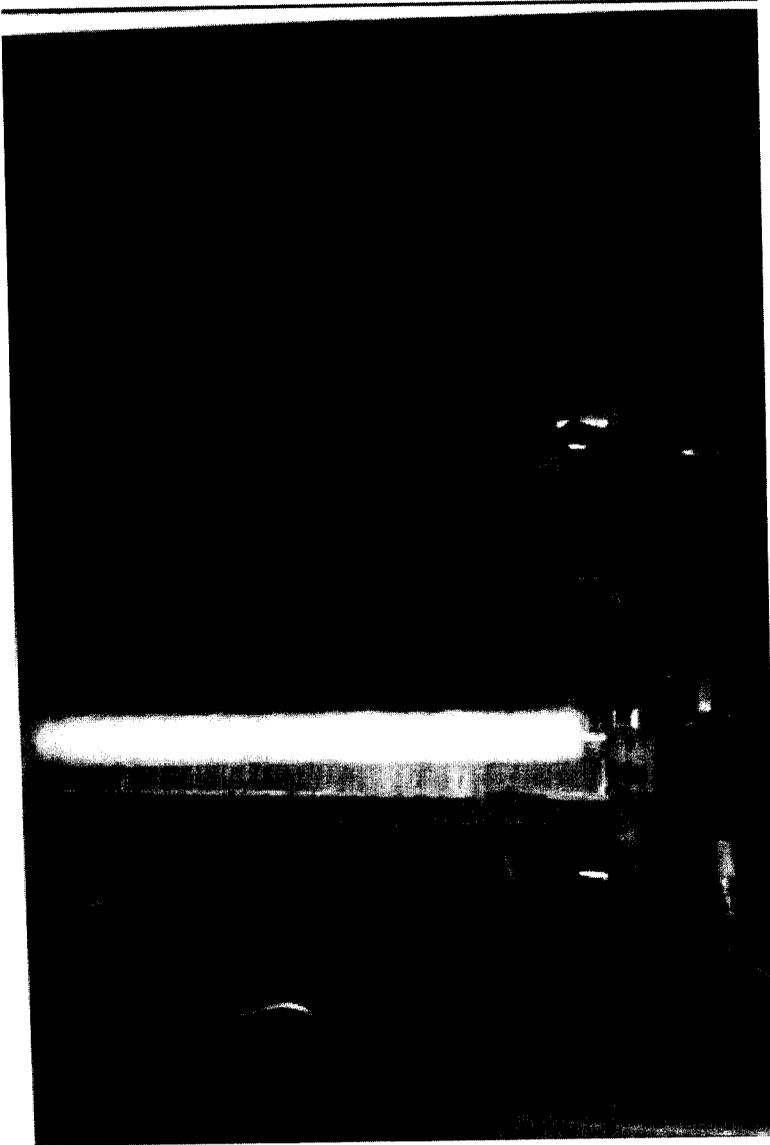

Figure-6.1. Side View Of The Carding With Pneumatic Doffing.

Figure-6.2. Front View Of The Carding Machine Having Pneumatic Doffing