
بسم الله الرحمن الرحيم
Bismillah hir rehman nir raheem | Translation: Shuru karta hun Allah ke naam se jo bada meherbaan aur nehayat rehem karne wala hai.

# Study of different types of ring travellers for their effects on yarn quality


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## School of Textile and Design

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# Study of different types of ring travellers for their effects on yarn quality

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## Bachelor of Science (Honors) in Textile Engineering

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# DEDICATION

First of all I dedicate my project to the greatest personality in the universe Hazrat Muhammad (S.A.W). Secondly, I dedicate my project to my greatest blessing: my parents, for every effort they made to make us happy, for every prayer they offered for me, for every second of their lives they dedicated to me!!! What I am today is because of them!!!

I also want to acknowledge my respected teachers especially **Mr. Naveed Akhtar**, due to their desire, care, affection and our keen interest, I achieved this level of excellence where I am looking for most bright future ahead.

May Allah bless all of them with everything He has ever created and may give me an opportunity to serve them the best way possible……. (Ameen)

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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

In the experiment we kept all parameters constant. Here we also performed experiment under these terms for each type of company traveller. Using these traveller one by one take results. We used three companies traveller respectively same no but different type of traveller. CISEL – VXL, ELI – RNF, and UIML –LRT. Due to different trails results we can easily identify which travellers best on the basis of IPI, hairiness & U %. On the basis of result the best traveller is VXL - CISEL 9/0 because of IPI value (89.5) is less than RNF and LRT. Unevenness Value (9.35%) is Lower than both others. Hairiness value (3.26) is also lower than others.

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## 1.1 **Introduction:**

In ring spinning traveller rotate on ring at high relative speed are used. Under industrial conditions, the travellers currently attain a relative speed up to 40 m/s without active lubrication. Worldwide, there are about 150 million ring spindles, all of which are equipped with metal rings. In the ring spinning work of highly industrialized countries, machine-relative performances of more than 90% are currently being achieved. However, the annual performance is considerably lower due to necessary maintenance and repair work. A substantial portion of the down time of a ring spinning frame is attributable to replacing the traveller which must be replaced at regularly recurring intervals. Depending on the spinning condition, the abrasion stresses acting on the traveller are so high that the traveller must be changed frequently, i.e. daily, weekly, or at most every second week. As the traveller becomes increasingly worn, the yarns collect more burls and fiber accumulation and become more hairy. The last condition in particular causes problems in subsequent processing.

The changing of the traveller and the subsequent re-starting of the ring spinning frame are manual operation. Since all of the about 600 to 1100 spinning points of the ring spinning frame have to be replaced with new travellers, such operations require a considerable number of personnel. Inevitably, all the filaments are broken. Occasionally, the used travellers fall into machine cavity. The fallen travellers are difficult to remove.

The ring, as a complementary part, has a load-dependent service life ranging from one to four years. A decline in the efficiency of the rings is inevitably accompanied by an increase in the thread breakage rates, increased traveller wear and deteriorating yarn properties. Replacement of the rings necessitates extensive machine down time because of the ring change-over and the complicated, but necessary, centering of the new rings. Subsequently, ring breaking-in periods lasting several days are required resulting in additional production losses due to frequent traveller change and lower spindle speed.

If the ring breaking-in periods is not performed according to the manufactures specifications, the ring may suffer damage. With the high quality standards demanded of ring-spun yarn, this running-in phase results in the production of wasted yarn.

Extensive development work has revealed that the central problem lies in the abrasion of the material in the form of hard micro-welds of the traveller material onto the ring surface.

As a result, an originally ideally polished ring surface is worn into a microscopic mountain range. The traveller, which slides over such a surface, exhibits an increasing tendency to scuff. The travellers running conditions on the ring become continuously worse and the efficiency of the machine deteriorates. In condition, the pairing of a steel ring and steel traveller as a galvanic element has the propensity to corrode during machine stoppages or in a hostile environment. Re-starting of the machine is then associated with serious breakdowns in the form of high thread breakage rates. The end result is considerable economic loss attributable to machine down time.

## 1.2 Problem statement

"Effect of different travellers on physical properties of 100% cotton carded yarn and spinning productivity"

## 1.3 Aims and objectives

Effect of traveller on yarn physical properties (strength, hairiness).
Effect of traveller shapes on 100% cotton yarn breakages.
To find out the best combination of ring and traveller.
To check the twist level by changing the travellers.
Effect of traveller on productivity of ring spinning.
Effect of traveller on quality of 100% cotton yarn.
Effect of traveller on hairiness of 100% cotton yarn.

## 1.4 Methodology

Ring traveler widely used in spinning mills. Ring travellers are main part of Ring Machines.Travellers impart twist in yarn. In yarn twist are imparted with the help of Ring Travellers. Traveller and spindle together help to wound the yarn on the bobbin. Traveller shape depend a lot because if the shape of ring according to requirement then we can attain better result so with this the twist imparted on the yarn should be well maintained. Traveler imparts twist to the yarn. Traveler and spindle together help to wound the yarn on the bobbin. Length wound up on the bobbin corresponds to the difference in peripheral speeds of the spindle and traveler. The difference in speed should correspond to length

delivered at the front rollers. Since traveler does not have a drive on its own, it is dragged along behind by the spindle.

High contact pressure (up to 35 N/square mm) is generated between the ring and the traveler during winding, mainly due to centrifugal force. This pressure leads to generation of heat. Low mass of the traveler does not permit dissipation of the generated heat in the short time available. As a result the operating speed of the traveler is limited.

When the spindle speed is increased, the friction work between ring and traveler (hence the build-up) increases as the 3rd power of the spindle rpm. Consequently if the spindle speed is too high, the traveler sustains thermal damage and fails. This speed restriction is felt particularly when spinning cotton yarns of relatively high strength.

If the traveler speed is raised beyond normal levels, the thermal stress limit of the traveler is exceeded; a drastic change in the wear behavior of the ring and traveler ensues. Owing to the strongly increased adhesion forces between ring and traveler, winding takes place between the two. These seizures inflict massive damage not only to the traveler but to the ring as well. Due to this unstable behavior of the ring and traveler system the wear is at least an order of magnitude higher than during the stable phase. The traveler temperature reaches 400 to 500 degree Celsius and the danger of the traveler annealing and failing is very great.

We use different types of travellers and different no of tevellers which are useable at same count to check the improvement in yarn properties and spinning productivity. We will check the yarn hairiness, yarn imperfections yarn physical appearance and some other yarn properties. We will do these experiments on different count like 30/1 combed yarn, 40/1 combed yarn and 21/1 Carded yarn. All these count will be made of 100% cotton fibers.We will do all these experiment at ELLCOT SPINNING Mills Ltd. Raiwind road Mangamandi and DEWAN SPINNING Mills Ltd. Phoolnagar Lahore Multan road.