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THE BENIFIST'S AND DEFECTS OF SPECIAL TOOLS ON A COMPACT RING SPINNING MACHINE

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Abstract
The article studies and compares the physical and mechanical properties of carded and combed yarn produced at the factory of the joint venture "Indorama Kokand Tekstil " of the Fergana region and "Pop FEN" of the Namangan region, and at the same time the advantages and disadvantages of a compact installation of a ring spinning machine are studied

Keywords: Circular spinning machine, compact spinning equipment, classic, re carding system, physical- and mechanical characteristics of thread, stretching pare, width of retting, front cylinder, appearing fibers on the thread.

Introduction

One of the most promising sectors today, that is, one that makes a significant contribution to the development of the economy of Uzbekistan, is the production of light industrial products. The volume of investments attracted to projects for the modernization of existing enterprises and the construction of new capacities is increasing year by year.

Currently, spinning enterprises are equipped with the most modern equipment and technology manufactured by world-famous companies such as Rieter (Switzerland) and Trutzschler (Germany), and yarn is spun mainly using both carded and cardless methods.

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The structure and operation of ring spinning machines are almost identical, differing from each other in the number of needles, the distance between the rings, the stretching device, the structure of the winding-wrapping mechanism, and the presence or absence of compact spinning equipment [1, 2].

The purpose of our research work is to study the advantages and disadvantages of compact yarn spinning devices on a ring spinning machine.

Compact yarn spinning The function of the devices is to compress the fibers by mechanically or air-actuating the thin fiber bundle in the front pair of stretching devices.

Research work was carried out at the joint ventures "Pop FEN" in Pop, Namangan region, and "Indorama Kokand Textile" in Kokand, Fergana region, in which yarn was spun in a simple and re-combing system. At the joint venture "Indorama Kokand Textile", yarn was spun on a spinning machine using a pneumatic compact device (Figure 1).

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Figure 1. G 37 ring spinning machine

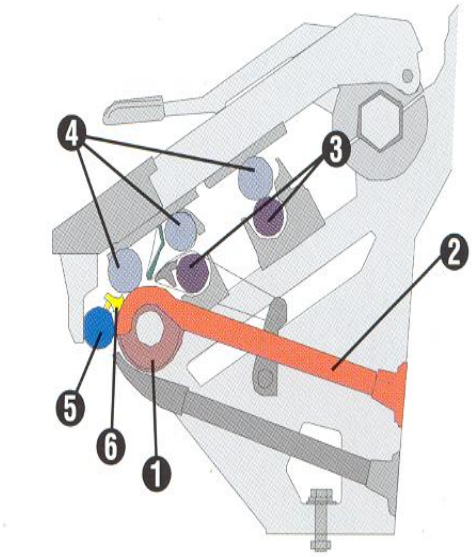


Figure 2. Technological scheme of a pneumatic compact spinning device:
1-perforation roller; 2-pneumatic pipe; 3-stretching cylinders; 4-upper rollers; 5-guide roller; 6-fiber compactor.

Figure 3. General view of the pneumatic compact spinning device

Figure 4. Short fiber suction device

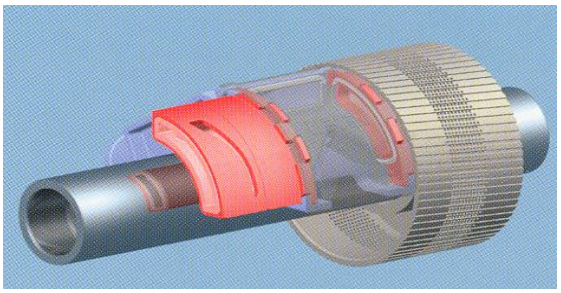


Figure 5. Pneumatic compact spinning unit compactor

Figure 6. Short fiber suction device

Figure 7. Compact thread device performance

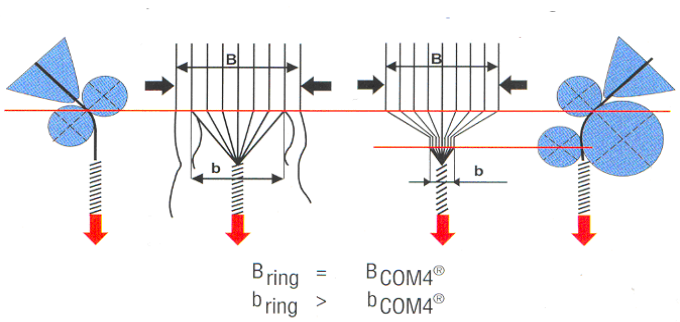


Figure 8. Shapes of the spinning triangle on a ring spinning machine in simple spinning (a) and compact spinning (b)

The lint width B at the exit of the front roller nip of the drawing pair is the same in both methods (Fig. 8). In the normal method, the fibers cover a certain part of the front cylinder surface in an uncontrolled manner (a). This causes the edge fibers to protrude from the yarn length and causes the formation of fluff on the yarn surface.

In compact spinning, the fibers are controlled by a special device on the surface of the cylinder, that is, the guide roller 5 (Figure 2) holds the fibers together, so the air vortex does not affect it and the base of the cooking triangle becomes smaller [3, 4, 5, 6].

In this way, the tuft fibers are compacted and arranged in a uniform tension on the yarn core. The individual views of the pneumatic compact device are illustrated in Figures 3-7.

The pneumatic compact spinning device is placed on the front cylinder of the drawing device. Its feature is that it has two loading rollers on the front cylinder and a compactor (Figure 3) that compresses the width of the outgoing fluff. The compactor is pulled into contact with the cylinder under the influence of constant air. Since the two loading rollers cover the front cylinder, the height of the cooking triangle also decreases, and changes occur in the yarn formation.

In the production of knitting yarn with a linear density of 20 tex ( ), medium-fiber cotton of the "good" class of the Namangan-77 selection variety, 4-5 type I varieties and 4 type II varieties, was used. $N_e = 30$

The properties of cotton fiber and fibers in semi-finished products were studied using the USTER HVI 1000 M1000 instrument and AFIS PRO 2 testing laboratory equipment from the Swiss company "USTER" [7, 8, 9, 10, 11].

Weft, warp and weft unevenness USTER TESTER 5-S800, breaking strength, elongation at break and breaking time of yarn USTER TENSORAPID 4, number of twists in yarn USTER ZWEIGLE TWIST TESTER 5 and organoleptic yarn quality test The results were compared with the Uster Statistics-2013 standard indicators and are presented in Table 1 [3] .

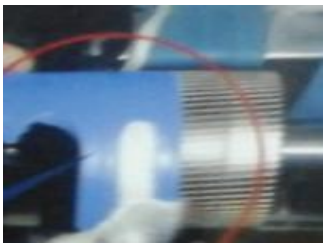
As can be seen from the physical and mechanical properties of the yarn spun at the Indorama Kokand Textile Joint Venture (Table 1), the indicators for linear density unevenness, linear density variation coefficient, breaking strength variation coefficient, and relative toughness

variation coefficient were determined to be 5%, and for breaking strength, number of knots (Neps), and relative toughness, the quality category was determined to be 25%.

As can be seen from the physical and mechanical properties of the yarn spun at the Pop FEN joint venture (Table 1), it was found that the linear density is not woven, the coefficient of variation in linear density is 25%, and the breaking strength and relative toughness indicators are 75%. As can be seen from Table 1, the remaining indicators do not correspond to any quality category .

When analyzing the table indicators, it was found that the yarn spun at the Indorama Kokand Textile Joint Venture was 36.2% higher in linear density than the yarn spun at the Pop FEN Joint Venture, 13.5% higher in relative density, and several times higher in other indicators.

The high quality of yarn spun at the Indorama Kokand Textile Joint Venture can be explained by the fact that the yarn is spun in a re-combing system at the enterprise and a compact device is used [12, 13, 14, 15, 16, 17].



It should be noted that despite the achievements, experts and our research have identified the following disadvantages of the pneumatic compact device:

1. The width of the fluff V (Fig. 8) at the exit of the front roller clamp of the stretching pair is maintained as in the normal method.

Figure 9

2. The pneumatic device does not perform its function as a result of the fibers getting stuck in the slot in the short fiber suction device (Figure 9).
3. It is not possible to tell if short fibers are stuck in the slot (Figure 9) in the suction device.

Conclusions:

1. It was determined that the physical and mechanical properties of the yarn spun at the Indorama Kokand Textile Joint Venture correspond to the Uster Statistics-2013 normative indicators.
2. It was determined that the yarn spun at the Indorama Kokand Textile Joint Venture was superior to the yarn spun at the Pop FEN Joint Venture in all indicators.
3. As a result of the study, the shortcomings of the pneumatic compact device were identified.

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