ADVANTAGES AND DISADVANTAGES OF COMPACT YARN DEVICES ON SPINNING MACHINES

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Abstract. As a result of the experiments, it was found that the yarn of the JV "Indorama Kokand Textile" is 36.2% less dense than the yarn of the JV "Pop FEN", 13.5% in relative hardness and several times higher in other indicators.

Key words: compact spinning equipment, classic, re carding system, physical- and mechanical characteristics of thread, stretching pare, width of retting, front cylinder, appearing fibres on the thread

Аннотация. Ўтказилган тажрибалар натижасида «Indorama Kokand Tekstil» қўшма корхонасида йигириб олинган ип «Pop FEN» қўшма корхонасида йигириб олинган ипдан чизиқий зичлиги бўйича нотекслиги 36,2% га, нисбий пишиқлиги бўйича 13,5% га ва қолган кўрсаткичлар бўйича бир неча маротаба юқорилиги аниқланди.

Калит сўзлар: компакт ип йигириш қурилмаси, оддий ҳамда қайта тараш ип йигириш тизими, ипларнинг физик-меаник хоссалари, чўзувчи жуфтлик, **момиқ** эни, олдинги цилиндр, ип юзасида туклар хосил бўлиши.

Аннотация. В результате проведенных опытов установлено, что пряжа СП «Индорама Коканд Текстиль» на 36,2 % менее плотная, чем пряжа СП «Поп ФЕН», на 13,5 % по относительной твердости и в несколько раз выше по другим показателям.

Ключевые слова: компактная установка, кардная и гребенная система прядения, физико-механические свойства пряжи, вытяжная пара, ширина мычки, ворсистость пряжи.

Currently, yarn spinning enterprises are equipped with the most modern equipment and *technology* prepared by the world-famous "Rieter" (Switzerland) and "Trutzschler" (Germany) companies, and yarn is spun mainly by spinning and unspinning methods.

The structure and operation of the ring spinning machines are almost the same, they differ from each other in the number of spokes, the distance between the rings, the

stretching device, the structure of the cooking-winding mechanism, the presence or absence of compact spinning equipment.[1, 2, 3, 4, 5]

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

The function of compact spinning devices is to densify the fibers by mechanically or air acting on the tuft of thin fibers in the front pair of the drawing device.

The current main manufacturers of compact spinning machines are mechanical engineering firms such as Zinser, Rieter and Suessen.

Research work was carried out at the joint enterprises "Pop FEN" in Pop, Namangan region and "Indorama Kokand Tekstil" in Kokan, Fergana region. In the joint enterprise "Indorama Kokand Tekstil", yarn was spun using a pneumatic compact device on a K45 ring spinning machine.[6, 7, 8, 9, 10]

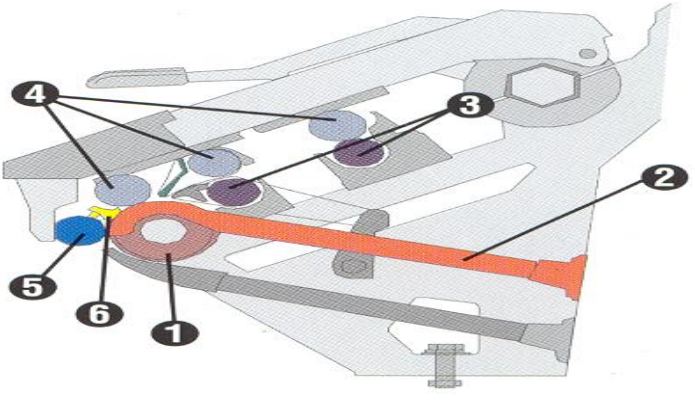

Figure 2.Technological scheme of the pneumatic compact yarn spinning device:

1- perforation; 2- pneumatic pipe; 3-extension cylinders; 4-upper rollers; 5-guide roller; 6- fiber compactor.[11, 12]

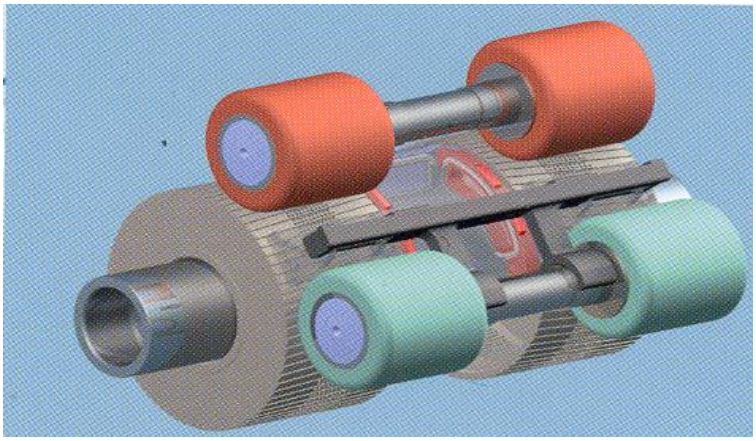

Figure 3. Overview of pneumatic compact yarn spinning device

Figure 4. A device that absorbs short fibers

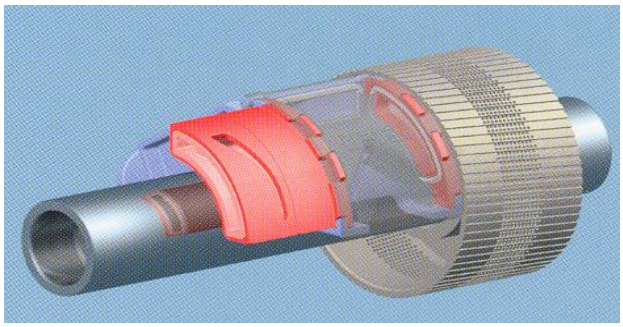

Figure 5. Pnevmatic compact yarn spinning device compactor

Figure 6. A device that absorbs short fibers

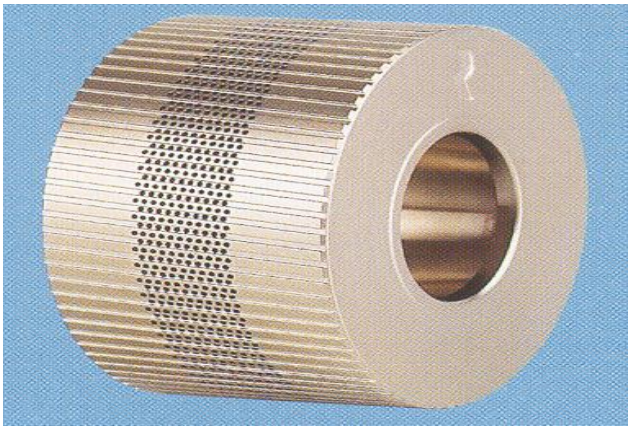

Figure 7. Perforation of a compact thread device

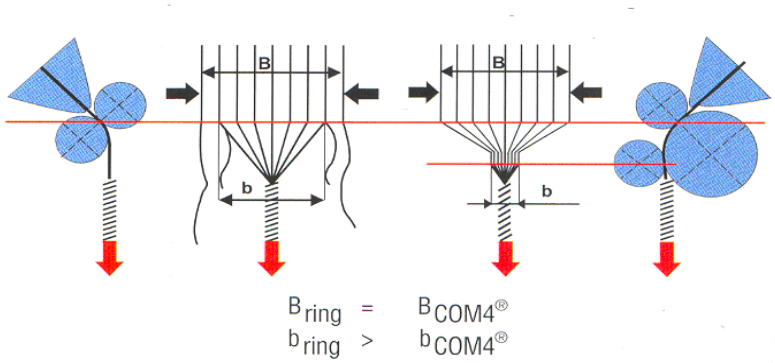

Figure 8. Shapes of the cooking triangle on a ring spinning machine in normal spinning (a) and in compact spinning (b)

At the exit of the extension pair from the front roller clamp, the fluff width V is equal in both ways (Fig. 8). In a simple method, fibers cover a certain part of the surface of the front cylinder without control (a). This causes the fringe fibers to protrude from the core of the yarn and causes hair to form on the surface of the yarn [13, 14, 15, 16].

In compact yarn spinning, the fibers are controlled by a special device on the surface of the cylinder, that is, the guide roller 5 (Fig. 2) sticks the fibers together, so the air vortex is not affected and the base of the cooking triangle is reduced.

In this way, the fibers of the tuft are compacted, and they are placed in the core of the thread in the same tension. The individual views of the pneumatic compact device are described in Figures 3-7[17, 18, 19, 20].

The pneumatic compact yarn spinning device is placed on the front cylinder of the drawing tool. Its feature is that it has two loading rollers on the front cylinder and a compactor (Fig. 3) that compacts the width of the output fluff. The compressor is pulled against the cylinder by the influence of constant air. Due to the fact that two loading rollers cover the front cylinder, the height of the cooking triangle also decreases, and changes in thread formation occur [21, 22, 23, 24].

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

The properties of fibers in cotton fiber and semi-finished products were studied using the USTER HVI 1000 M1000 instrument and AFIS PRO 2 test laboratory equipment from the Swiss company "USTER"[26, 27, 28].

The unevenness of braid, pile and yarn was determined by USTER TESTER 5-S800, yarn breaking force, elongation at break and breaking time by USTER TENSORAPID 4, the number of twists in the yarn USTER ZWEIGLE TWIST TESTER 5, and the quality of yarn using the orgonoleptic method was determined by

the USTER ZWEIGLE YARN INSPECTION WINDER. The obtained results are compared with Uster Statistics-2013 normative indicators and presented in Table 1[29, 30, 31].

It can be seen from the physical and mechanical properties of yarn spun at Indorama Kokand Tekstil joint enterprise (Table 1) that the unevenness in linear density, coefficient of variation in linear density, coefficient of variation in tensile strength, coefficient of variation in relative hardness are 5%. , was found to be in the 25% quality category in terms of breaking strength, number of knots (Neps) and relative hardness.

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

Analyzing the table indicators, the yarn spun in Indorama Kokand Tekstil joint venture is 36.2% less dense than the yarn spun in Pop FEN joint venture, 13.5% in relative hardness, and several times higher in other parameters. was determined.

The high quality indicators of the yarn spun in the joint enterprise "Indorama Kokand Tekstil" can be explained by the fact that the yarn is spun in the re-combing system and a compact device is used in the enterprise[32, 33, 34, 35, 36, 37].

It should be noted that despite the achievements made by experts and our research, the pneumatic compact device has the following disadvantages:

1. At the exit of the extension pair from the front roller clamp, the width of fluff V (Fig. 8) is kept as it is in the normal method.

2. The pneumatic device does not perform its function due to the fact that the fibers get stuck in the slot in the suction device for short fibers (Fig. 9).

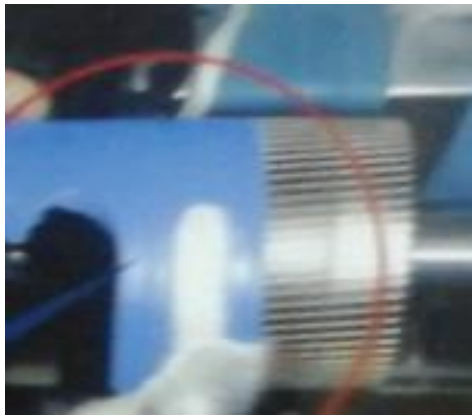

Figure 9. Short fiber suction device

3. It is impossible to tell if the short fibers are stuck in the slot in the suction device (Fig. 9).

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