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The Issues Of Beaming Yarn Bobbins And The Policies Of Eliminating Them

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ABSTRACT

In the article the problems occurring during the process of warping yarns in textile fabrics and the basic factors of them are reviewed carefully. The length of the spun yarn, diameter and relative reel tension, the size of the package are analyzed in this research. The formation of cone and roller bobbin yarn packages has been studied and analyzed.

KEYWORDS

Single yarn, ply yarn, compact twister, warping machines, sectional warping, warping drum, beam spool.

INTRODUCTION

If we take a look at the period which contains the history and today of the human, he surely pays attention to the quality of each thing which is necessary for satisfying his needs. He doesn't pay attention not only to the food but also to the clothing. These two products have been paid a serious attention as a valuable necessity of the humanity for centuries.

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Weaving is one of the oldest and most widely used methods of making a fabric [1, 2]. Simply put, weaving is the interlacement of two sets of threads; the warp threads run vertically through the length of the fabric and weft threads run horizontally across the width of the cloth [3]. The standard documentation of weaving processes, which permits fabrics to be recreated, will be defined [1, 4].

Today, due to the requirements of the market, various researches are being done over a few issues such as: improving the quality of the products derived from cotton and yarn, increasing economic efficiency, and growing the size of manufacturing because of the great demand for naturally manufactured products.

DISCUSSION AND METHOD

So far, have the various searches been made into the production of woven fabric and these are still going on. The production of weaving, what is a woven fabric, consists of a two systematic yarn. While the first one is a warp, the second is weft threads. Warp threads go through a few technological processes until the stage of weaving. These technological actions are chosen according to that what kind of woven fabric is manufactured. For instance a warp yarn is classified into the ground warp and pile warp. Ground warp is mainly twisted and spun on the warp spool with the help of sectional warp machines.

The point of the warp process is winding particular numbers of warp yarns on the warp or weaving spool in a proper size. While warping, the formation of warp starts and these following requirements are requested from it.

- Not damaging physical and mechanical features of the yarn:
- Having the same yarn tension for all yarns and being smooth of the yarn tension during the process;
- The precise size of the yarn length in a skein;
- Having high efficient process and less rubbish;

While warping is a highly responsible and significant process, the errors made during this process cannot be eliminated in the next stages. The yarn tension skein tension, supporting the same size of skeins and avoiding the variety of the skein sizes is extremely significant during the process [5,6].

These methods of warping are available based on the type of yarn and the supported technologies:

- Direct warping;
- Sectional warping;
- Sectional warping;

Yarns are provided continuously or intermittently in the warping machines according to the policy of supporting warp yarn. Moreover in most of the fabrics, warping machines provide warp yarn continuously. Because of this reason, enlarging the size amount of reeling skein not the machine is considered as the best option to increase the work efficiency. A lot of scientists made researches into measuring the count of skeins.

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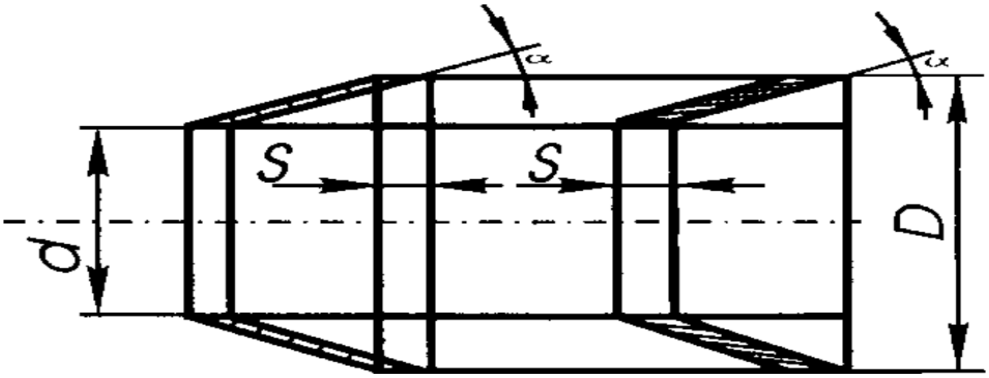
The linear velocity of the yarn which has electronic control system in modern warp machines supports the same speed of reeling yarn on a weaving spool and on the drum also the regular speed of reeling is kept [7]. The size of the yarn realed on the drum is based on the maximum diameter of beam flange. The picture of the warp reeled on the drum is given below.



1-picture.the drawing of the sliver reeled on the drum

The measurement of the sliver size reeled on the drum:

$$V = \frac{1}{2}\pi ns(D+d)lsin\alpha = \frac{1}{2}\pi nslsin\alpha(d+d+2lsin\alpha) = \frac{1}{2}\pi nslsin\alpha(2d+2lsin\alpha) = \pi nslsin\alpha(d+lsin\alpha); \quad sm^3$$

Here: D- the diameter of the on the drum; sm.
n- number of strands.
S- headstock moving distance; sm.

d- the diameter of warping drum; sm.

l- the length of cone; sm.

α- the corner of cone; sm.

The size of the package is related to the size of package on the weaving spool and the diameter of the weaving spool flange.

The package's size on the weaving spool:

$$V=\frac{\pi H}{4}(D_g^2 - d_{O'Z}^2); \quad m^3$$

With the aid of this formula, the measurements of the weaving spool flange by the size of sliver packages reeled on the sectional warping drum[8].

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DISCUSSIONS

In these days, basing on the cloth type either the Pluto yarn or single yarn is used. In most textile fabrics, studying the problems coming from warping machines in towel producing fabrics and eliminating them are searched in this article.

The problems occurring during the warping yarn process:

- The various lengths of the yarn skeins on the bobbins in warp creels.
- Not choosing the diameter of yarn skeins on bobbin holders properly.
- Not reeling the warp off yarns in a proper size.
- The great proportion of yarn skeins which are being left on the yarn holders in warp creel.
- Not having Psixrometr equipment used to measure the temperature of the room, and the degree of humidity in the warping section.

1. Keeping the same length of the yarns on the bobbins which are being installed to warp creel is the basic issue. The solutions of this are preparing the yarns to be twisted controlling the same length of the yarn skeins in Pluto machines regularly and picking up the relative intensity of twisting yarns correctly during the preparation. Changing the warps tensions due to the warp yarn numbers, checking the springs continuously and exchanging the faulty ones are also significant.
2. Choosing the intensity of relative twisting and twisting yarns without affecting the physical and mechanical features of the yarn while doing this during the process of twisted yarns, the relative twisting in tension of reeling yarn off is allowed between 0.42÷0.52 gram/sm^3 [9].

   The distance between the bobbin holders on the warp creel is from 280 mm to 290 mm in the warping machine model "SERVOTRONIS" 1100 provided by an Indian firm "PRASHANT GAMATEX" totally [10], 720 bobbins are organized to transport the yarn on the left and right hands. Additionally, 720 bobbin holders are installed for the bobbins if there is a need for them. As a result of going on these researches, the length of the yarn on the skein is 51020.41 meters, when the diameter of the bobbin skein is D_1=234 mm and D_2=246mm, at the same time the tension of reeling is 0.46 gram/sm^3. Nowadays, because of the variety and the yarn diameter of the yarns prepared for twisting in the fabrics, the problem started here comes to the warping stage and it is causing extension of the percentage of yarn skein left on warp creel bobbins.
3. The difficulties in sliver enough warps on the drum in the warping place are coming out of the different sizes of yarns on the skeins during the preparation and twisting process. When the warps on the drum are moved to the warping spools, there is no enough possibility of getting enough skeins and as a result gappy spools is being transported to the weaving machine.
4. The length of unwinding yarn is different because of the varied sizes of yarn skeins installed on warp creel. The analysis of yarn skein taken from warping machines can be seen in the following first diagram.

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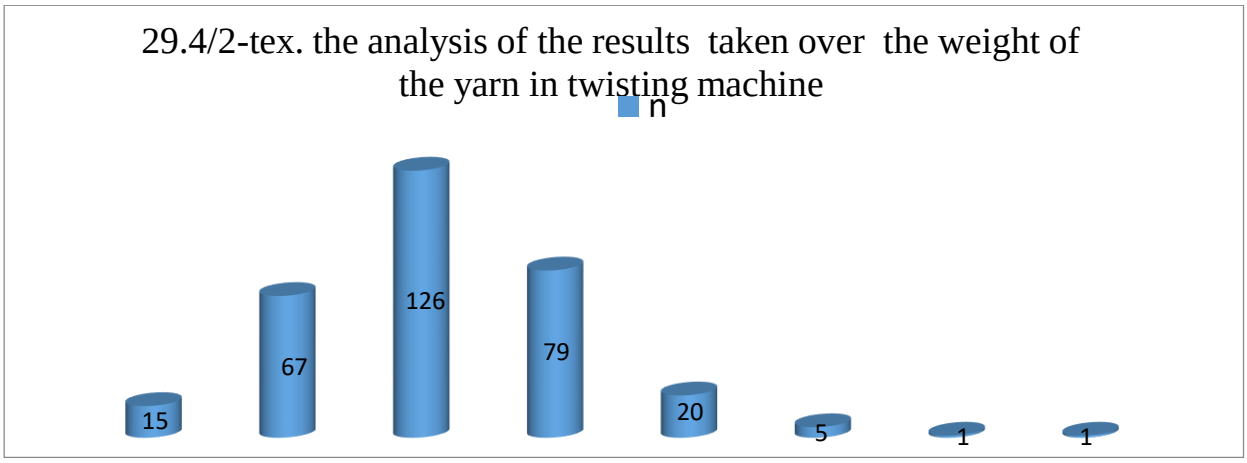
1-digaram

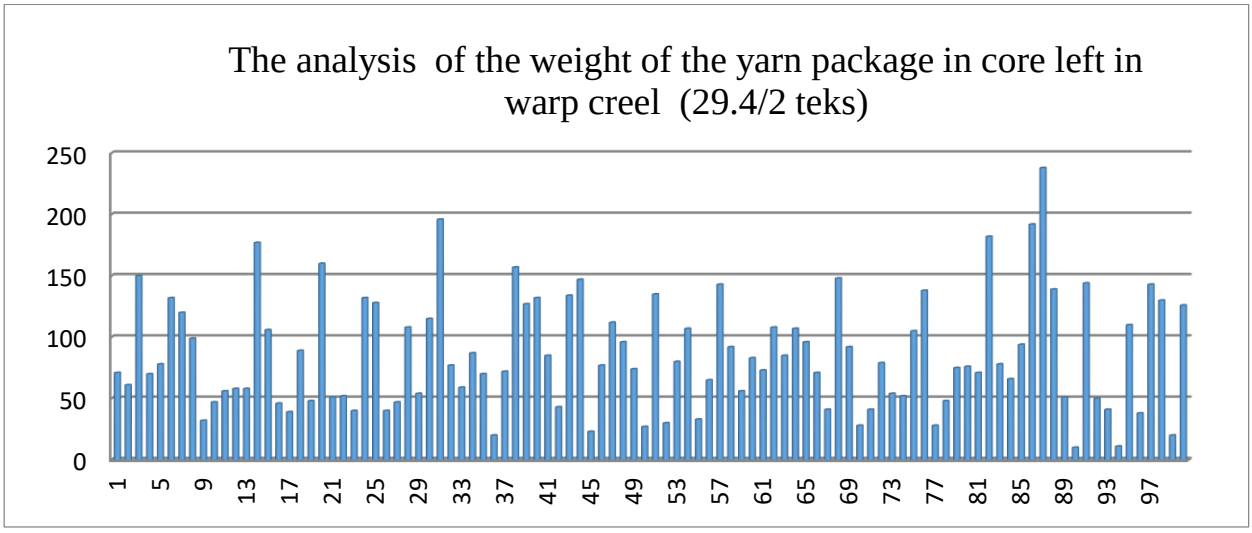


If we analyze the first diagram, the difference between a 2500 gram yarn and a 2850 gram yarn skeins is 350 gram.

In the machine there a 12 ,7 % difference while producing a skein.

The analysis over the weight of the bobbins left on the bobbin holders in warp creel is shown in the second diagram.

2-diagram



In this diagram the weight of the yarn skein is at least 11gram. The weight of the most greatly left yarn package is 238 gr. The variety between the weights is 227 gram, it means a 4710- meter yarn.

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The formula of measuring the length of yarn on the package:

L= $G_{og'}$*1000/(T_{ip}); meter

Explanation if it is a twisted yarn, it is multiplied to that how many single yarns there are in a yarn. For instance: 29.4/2 is written in this formula (29.4*2).

5. In most textile fabrics, the equipment measuring the relative humidity and the air temperature is not installed in classifying sections. As a result , the bobbins placed on the warp headstocks are haring yarn disconnections because of the room's not having a normal temperature. For example while reeling a warp on the drum for 41 minutes , the yarn broke off 14 times during this period. A worker spent a minute and 40 seconds to connect the broken yarn. This case was viewed while slivering 9 warps and that caused the decrease of the efficiency. In addition each time when the yarn breaks off, the yarn tension changes affecting the relative twisting intensity. Since every time when the yarn disconnection occurs, a particular length of the yarn is removed and linked to the rest part of the yarn. So, the yarn wastes increase. The knots in the yarns reeled on the warp spools affect the smooth movement of the yarn on weaving loom and the yarns disconnect regularly. The warp yarn disconnection makes it difficult for the worker responsible for weaving loom.

CONCLUSION

In the article, the various issues are coming out from the different lengths of the yarn on spools in most fabrics. Technological devices aren't able to work with enough power. In twisting yarn spools, there is no much difference between the sizes of the yarns taken from reeling machines. Moreover, during preparation for twisting and twisting, the relative degree of reeling yarn off spools and the spool sizes are not the same, that's why lots of warping problem are occurring.

Even though it is impossible to eliminate the differences between the spool sizes at all, we can decrease the differences and the yarn wastes being produced during technological operations.

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