http://www.pjbs.org

PJBS

ISSN 1028-8880

Pakistan Journal of Biological Sciences

ANSInet
Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Pakistan Journal of Biological Sciences 6 (1): 76-77, 2003
ISSN 1028-8880

Study on the Quality of Gardella Fine Yarn in Comparison to Modified Ring Spinning Frame Fine Yarn

A.K.M. Mahabubuzzaman, Latifa Binte Lutfar, Md. Asaduzzaman,
Md. Osman Gani Miazi, F.A. Dilruba and Zakaria Ahmed
Bangladesh Jute Research Institute, Manik Mia Avenue, Dhaka-1207, Bangladesh

Abstract: The spin Guard Gardella is a centrifugal type dry spinning machine. In this machine yarn can be spun from 72 (2.08 lbs./spy) to 241 tex (7 lbs./spy). But in this system of this machine, it is preferable to produce fine yarn. Here fine yarn 103 tex (3 lbs./spy) was produced in existing speed. Apron Draft Spinning frame was modified into ring spinning system. In this system rings and travelers were used and fine yarn upto 103 tex (3 lbs./spy) was produced. Bangla white B (BWB) grade jute fibres were used for producing fine yarn. The spinning performance and physical properties of produced yarn were found and compared. It was found that the yarn produced from Gardella spinning frame was better than modified ring spinning frame.

Key words: Gardella, spinning, ring, yarn, fibre

Introduction

Jute is a coarse, rough, bast fiber having no staple length at all. In raw state its stays in the form of long mesh of interconnecting fibres termed as reed. Now a days jute fiber has been facing a tough competition with other synthetic fiber such as polyester, rayon, acrylic etc. Main reason of this tough competition is fineness of yarn, which is an important criteria for woven canvas, twill, sheeting fabrics. Gardella spinning machine is used to produce such fine yarn. But initial investment of this machinery is extra-ordinary high which causes to the higher production cost of fine yarn.

Apron draft flyer spinning machine is the latest addition by James Machine and Sons. Ltd. to their range of jute manufacturing machinery. This machine is definitely an improved version spinning frame with higher rate of production, but this machine can not produce finer yarn like 103 tex. So, from this point of view apron draft flyer spinning machine is converted into ring spinning system and this system is suitable for producing fine jute yarn at economic cost of production. In this system rings and travelers are used instead of flyers (Ranjon, 1973; Atkinson, 1964).

Materials and Methods

This work has been completed by three years. Two batches each of 100lbs of jute fibres Bangla white B (BWB) were taken for experiment. The batches of those were softened in the softener machine with an application of 25% of emulsion by the weight of fiber. Then the soften jute batches were kept in piling condition for 48 h and were processed through conventional jute processing sequences i.e. breaker card, finisher card, 1st, 2nd and 3rd draw frame machine. Third drawing slivers were divided into two groups. One was for Gardella spinning frame and another group was for modified ring spinning frame. And yarn of 103 tex (3 lbs./spy) was spun in each frame respectively. Physical properties of produced yarns were tested by a computerized Instron Machine of Testing and Standardization Department of Bangladesh Jute Research Institute under standard atmospheric condition, 65%, RH and 20°C temperature (Atkinson, 1966, 1965; Ahmed, 1966).

Results and Discussion

Test results of jute yarn varied from one to another due to presence of thick and thin places in the produced yarn. To achieve an acceptable result various samples were taken for each test and their mean uses tabulated.

In this study, the experiments were carried out with Bangla white B (BWB) jute fibres on both Gardella and Modified Ring Spinning machine. In both cases their spinning performance like load at break, strain at break, tenacity and textile modules were satisfactory. But in this study quality ratio was 54.16 (Table 1) for modified ring spinning frame and 61.96 (Table 2) for Gardella spinning frame (Mather, 1963; Ahmed, 1979). The yarn produced from Gardella spinning frame is better than Modified Ring spinning frame. But it is shown that yarn produced by modified machines comparable and this

Table 1: Physical properties of jute yarn (103 tex) by the Modified Ring spinning frame from BWB jute fiber

Sample No.	Load at break (kgf)	Strain at break (%)	Tenacity at break (N/tex)	Textile modules (N/tex)	Quality ratio (%)
1	0.998	1.556	0.094	6.02	72.6
2.	0.501	1.287	0.048	3.97	37.6
3.	0.743	1.144	0.070	6.15	54.6
4.	0.647	1.163	0.061	5.27	47.5
5.	0.796	1.343	0.075	5.72	58.5
Mean	0.737	1.298	0.069	5.42	54.16
SD	0.182	0.166	0.017	0.88	13.01
CV	24.79	12.81	24.73	16.26	24.03

Table 2: Physical properties of jute yarn (103 tex) by the Gardella Spinning frame from BWB Jute fiber

Sample No.	Load at break (kgf)	Strain at break (%)	Tenacity at break (N/tex)	Textile modules (N/tex)	Quality ratio (%)
1	0.998	1.512	0.090	5.12	63.50
2.	1.201	1.431	0.081	6.01	70.72
3.	0.625	1.211	0.091	5.71	58.21
4.	1.321	1.151	0.085	5.91	62.25
5.	0.871	1.172	0.078	5.22	55.12
Mean	1.001	1.295	0.085	5.59	61.96
SD	0.274	0.164	0.006	0.403	5.91
CV	27.39	12.71	8.03	7.21	9.54

machine can be able to produce fine yarn like 103 tex (3 lbs./spy). At this moment the yarn produced from Modified Ring spinning frame will not be same with quality as like the yarn of Gardella spinning frame. So, modified spinning frame can be introduced in private sector jute mills for more quality yarn. The private mills will be able to produce fine yarn at an economic way by using this developed technology (Miazi, 1997; Sheikh, 1982).

References

Ahmed, H., 1979. Jute Spinning. 2nd Edition, Begum Fatima Ahmed (Ed.), Tejgaon, Dacca Pub., pp: 60-70.

Ahmed, H., 1966. Speed and production calculation of jute spinning machinery. Shahjahan printing works, Dacca, pp: 20-100.

Atkinson, R.R., 1966. Jute Spinning. 2nd Edition, ATI, Heywood books London, pp: 56-134.

Atkinson, R.R., 1965. Jute Fibre to Yarn. Chemical Publishing Co. New York, NY, USA, pp: 120-125.

Atkinson, R.R., 1964. Jute Fiber to Yarn. Heywood Books, London, pp: 190-198.

Miazi, M.O.G., 1997. Adaptation of Ring Spinning in the Flyer Spinning Machine for making fine Jute yarn. M.Sc. Thesis, Buet, Dhaka, Bangladesh, pp: 17-18.

Mather, J.N., 1963. Observation on the combing and splitting of jute fibres in a breaker card. Publication of the British jute Trade Research Association, Published at the Offices of the Association KINNOULL road, Kingsway west, Dundee, UK, pp: 71-77.

Ranjon, T.C., 1973. Hand Book on jute. Oxford and IBH Pub. Co. New Delhi, 1: 212-220.

Sheikh, M.A.S., 1982. Fine yarn spinning for jute fiber. Bangladesh J. J. Fib. Res., pp: 79.