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## TECHNICAL NOTE

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# STUDIES INTO THE OMISSION OF TAKE-DOWN TENSION SYSTEM IN CIRCULAR KNITTING MACHINES

A. A. A. Jeddi

*Department of Textile Engineering  
Amirkabir University of Technology  
Tehran, Iran*

**Abstract** This paper reports on an attempt to modify a circular knitting machine such that it would operate without the need for a customary tension system where a knitting machine can operate without an asymmetric take-down system preliminary results appear promising and warrant further development.

**Key Words** Circular knitting Machine, Take-down Tension System, Double Jersey Fabric, Dial Needle, Cylinder Needle, Yarn Breakage

**چکیده** در این تحقیق کوشش گردید ماشین بافندگی گردباف اصلاح گردد، به طوری که بتواند بدون مکانیزم معمول کشش پارچه، تولید نماید. نتایج اولیه بر روی ماشین نشان داد که می توان بدون کشش نامتقارن اعمال شده از سیستم کشش پارچه تولید انجام گیرد و این کار در آینده توسعه بیشتری خواهد یافت.

## INTRODUCTION

In a recent paper, it was demonstrated that the asymmetry of the fabric take-down mechanism in circular double jersey knitting machines results in double jersey fabrics whose face and back are not identical. To allow the creation of fabrics that possess face and back symmetry, an attempt was made to modify the take-down tension mechanism. The customary tension rollers were not used. Instead, a ring plate was placed between the dial and cylinder needles to assist in maintaining the tension. This modified tensioning system applies a symmetrical tension and produces fabrics whose face and back are identical. The new tensioning mechanism did not interfere with the normal

operation of the machine. A brief description of the workings of the machine is given below.

## THE OPERATION OF THE MACHINE

In this experiment, an 8 1/2 gauge double jersey Jacquard weft knitting machine was used. The tensioning device was in the form of a ring fitted around the cylinder between the cylinder and dial needles (see Figure 1). Several points must be mentioned explained in designing a tensioning device of this type.

1. In order to hold the loop in its position, the ring must be placed where there is needle movement. Such points are marked "A" in Figure 1.

2. The ring must have a slot large enough

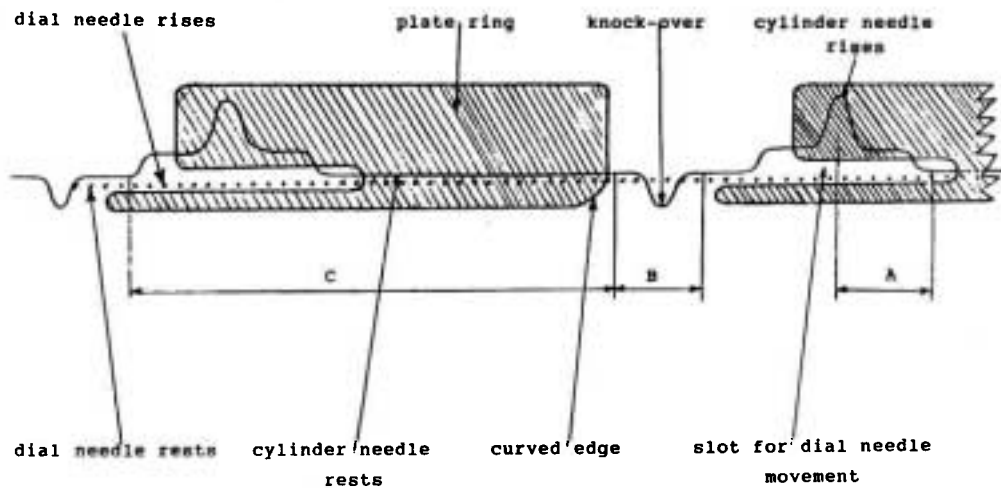


Figure 1. The tensioning device fitted around the cylinder between the cylinder and dial needles.

to allow for the movement of the dial needles.

3. The ring must allow old loops to pass down between the beds. For example, at the knock-over area (area marked "B" in Figure 1), an opening in the ring is necessary.

4. The ring must include provisions for the adjoining yarn between the loops on each bed to pass below the ring before the needle operates at the next feed (e.g. area "C" in Figure 1).

During the initial experiments, the fabric would tend to rise back-up between the beds where the needles are at rest. To overcome this, it is necessary to impose tension on the fabric.

An ideal position for the ring is between the knock-over at one feed and the feeding point (after clearing) at the next feed (see area marked "C" in Figure 1). It was also found that the leading edge of the ring passing the knock-over position must be curved to avoid build-up and breakage at the old loops.

After several attempts, the machine was finally equipped with four stainless steel tapered segments whose inside diameter measured 47.75 cm. (see Figure 2). These were attached to the dial needle bed

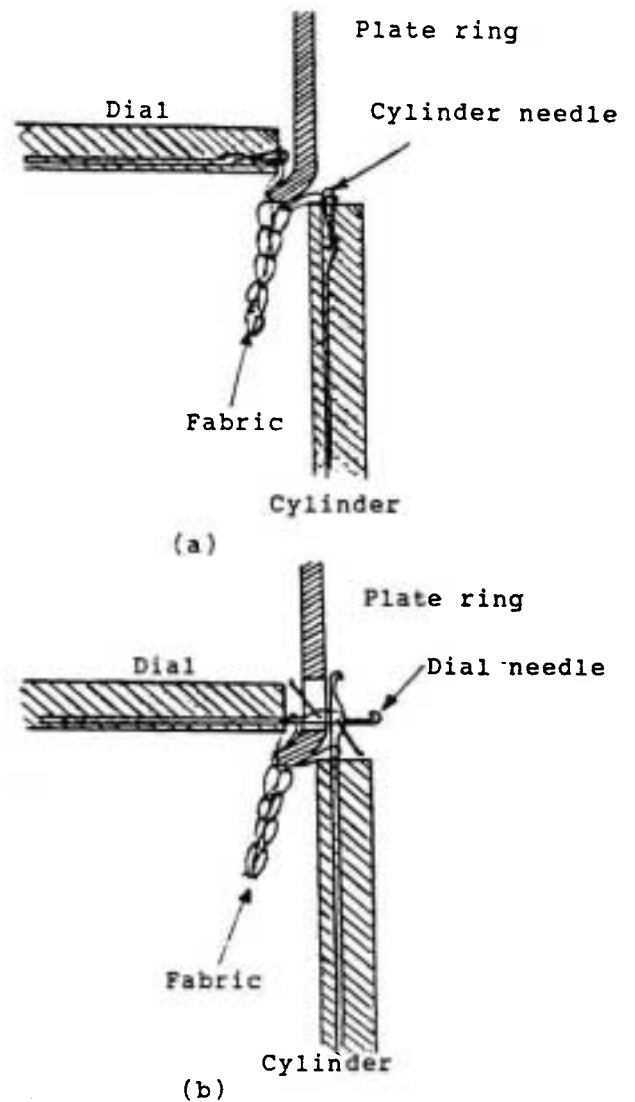


Figure 2. A symmetric tension system with a bended plate ring.

by screws.

Finally, when using this tensioning device, it is necessary to adjust the distance between the dial and the cylinder and the knock-over to avoid undue yarn breakage.

### CONCLUSIONS

Further refinement of this type of a tensioning device may be necessary before an industrially viable machine can be produced. It is important to note, however, that fabrics produced using this device are thicker and possess a superior handle than those produced on the cylinder and

the dial loops, the properties of the face and the back will be identical; the size and the formation of the loops will be identical and the normal curvature of the fabric will be almost zero as the loop distortion in both sides of the fabric will be equal. Consequently, the fabric would not curl.

### REFERENCE

1. A. A. A. Jeddi, "The Effect of Machine Settings on the Properties of Double Jersey Knitted Fabrics Constructed from Various Yarns", *Journal of Engineering, Islamic Republic of Iran*, Vol. 8, No. 1, (February 1995), 37-47.