KNITTING

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ABSTRACT

Timothy W. Ellis of ITT Technologies, Inc. reviewed the knitting exhibits at the ITMA exhibition held in October 2003 in Birmingham, England. The review includes details of weft and warp knit machines or technical modifications that were unique from previous exhibitions. The review also includes several related items in support of knitting.

Keywords: Knitting, ITMA 2003, Warp Knitting, Circular Knitting, Knitting Needles, Knitting Feeders

Introduction

The ITMA 2003 exhibition in Birmingham, England offered one hall of machinery presentation covering knit manufacturing. The entire show totaled 16 halls of exhibitions. As with the previous shows, there were few leaps in technology. Most of the exhibits covered technological changes that allowed increased speed, pattern flexibility, expanded styling, and more processor control. Additionally, there were trends that involved the use of servomotor control of machine functions and circular knitting machines with capabilities that once required flat knitting machines. Very few flat knitting machines were observed in the hall. The following sections detail offerings observed that were of note in the areas of circular and warp knitting. Also described is some support equipment of interest.

Circular Knitting

The circular knitting offered a range of machines in single and double knits with tremendous pattern capabilities. Machines of interest are separated by vendor and listed below:

Mayer & Cie

- Relaknit 4.0
  This machine was shown with a 1500 speed factor, four feeders per inch of diameter, and a high frame capable of 500 lb rolls. It had a moveable stand to allow knitter access to the large machine. The machine had a computer-controlled adjustment of the quality wheel called MCTMATIC and a processor controlled braking system for larger rolls.
• Relaknit 3.2
  This machine has had the knitting area lowered by seven inches thus accommodating the Chinese market without sacrificing roll size.

• OVJA 1.1 TTRB
  This machine knits with a separating thread and welt for individual part production and has the capability to transfer a stitch from cylinder to dial and dial to cylinder. Its production can equate to ten flat knitting machines.

• Relaknit 0.8
  This machine is designed to knit inelastic yarns such as copper, steel, glass, and carbon.

• FS 2.0
  This rib machine has the capability with the support of sinkers to “knit on automatically” like a jersey machine. This capability should reduce downtime at each stop. It also has a delayed timing capability of up to 5 mm.

• MDA
  The Meyer Data Acquisition system is available on the Mayer & Cie knitting machines and allows monitoring of other machines using Microsoft Excel via the plant local area network (LAN).

Monarch

• VAERGY
  This double jersey machine featured an auto-timing system that allowed automatic switching between synchronized and delayed timing. It also highlighted a redesigned striper box with smoother, easier, and faster operation.

• V-LEC3DGTY2
  This double jersey jacquard machine is capable of knitting garment lengths with welt separation via a draw thread. It also has the capability to perform stitch transfer from the cylinder to the dial and the dial to the cylinder at all feeds. The machine also allows for stitch length change on the fly from the microprocessor.

• OD-VXAC
  This single jersey machine was one of many machines shown with the OD device for open width roll up of fabric which has become an option for crease sensitive fabrics. The machine also demonstrated the automatic stitch control systems ATSS and ACSS. The ATSS is Auto Tape Speed and the ACSS is Auto Control Stitch control. These systems allow for quick adjustment of the feed and stitch length through the utilization of servomotors controlled by the microprocessor. These systems allow for a gradual adjustment within a 12-inch run. This type of change should set tension faster, reduce waste and allow more accurate setting.
VC-SDR  
This machine exhibited the Stitch Differential System (SDS) that allows two different stitch lengths at consecutive feeds. For each feed, there are two different adjustment points. The upper adjustment point controls the feed for all four tracks while the lower control adjust only the two lower tracks.

Terrot

- UCC124ST  
This double knit machine was one of many to demonstrate the capability of stitch transfer from dial to cylinder and cylinder to dial. It also sowed a five-finger striper box, electronic stitch length control and the ability to individually control the speed of each feed.

- 13PS72  
This interlock machine was shown with 84 feeds on a 34-inch cylinder at a speed of 30 RPM. The frame allowed individual control of each feed with individual motorized feeds.

- APL-2  
This plush machine demonstrated servomotors that replace the quality wheel for control of the feeders; this concept was displayed by many of the vendors.

Warp Knitting

The warp knitting exhibitors were primarily Karl Mayer and Liba. Some of the items of interest are listed below:

Karl Mayer

- Textronic (TL 66/1/36)  
This raschel machine was demonstrated with 66 guide bars for lace production. The higher number of guide bars was facilitated by the new EL drive and control system. This system utilizes string connections driven by servomotors that replace the traditional drive systems. This machine demonstrated a shog distance of 170 needles.

Vanguard

- Vanguard, which is owned by Monarch, exhibited two Jumbo machines for accommodating large roll sizes. The single knit machine was the 4SJ4/HAC12 and the double knit machine was the 2SRS/HI. Both of these machines were exhibited with capability of 1500 speed factor.
• Fascination (FL 20/16)
This raschel machine for elastic fabrics was shown at 700 RPM with 20 guide bars and the EL control system similar to the Textronic machine. The shog distance for this machine was 190 needles.

• High distance (HDR 6 EL)
This double bar raschel machine for spacer fabrics was shown with an electronically controlled spacer height adjustment with a range of 25 – 65 mm.

• RSE 4 / RSE 5
This raschel machine has the capability of five ground guide bars allowing an additional Lycra feed.

• Tricot (HKS 2-3 / HKS 3-M)
These tricot machines were shown utilizing a new drive concept that reduces heat generation and improves machine performance. The two-guide bar machine was shown at 3500 RPM and the three-guide bar machine at 2100 RPM. The optional pile device on the three-guide bar machine was infinitely adjustable from 1.5 to 3 mm.

Liba

• DK506DPLM
This double needle bar raschel machine was shown with the capability for linear trick plate adjustment. This allows for easier adjustment on difficult styles.
Memminger IRO

• Feeder
  This new feeder is both a storage and positive feeder in one unit. Either system may be used on each feed of the knitting machine. This should allow more style flexibility when using multiple yarn types within a product.

• MLT Wesco
  This measuring instrument combines the features of the Wesco yarn rate meter and a tension meter thus allowing the set up technician to carry just one device.

Groz-Beckert

• Litespeed needles
  This new needle reduces machine temperature and energy consumption and increases needle life. The Litespeed needles have had material removed from the needle shank by precision grinding. Test results have shown a 14% reduction in temperature and power.

Protechna

• Tensoscan
  This prototype is a tight end detector for warping. The sensor is a traversing thread probe that measures the tension of each individual thread.

Figure 8. Protechna Tensoscan

Appalachian

• Programmable Tension
  This system utilizes the processor to individually tension each element after the technician has measured the tension of the ends from the front and back of the creel. This system allows for more accurate leveling of the tension for each position. Tension can be added from 0 to 75 grams.