

FIMAST showcases new sock and hosiery knitting machine developments

A variety of new sock and hosiery knitting machines, ranging from low cost models to machines producing high quality technical socks, were on display in Brescia.

The FIMAST exhibition, which took place in Brescia in September offered visitors a wide range of new developments for the sock and hosiery manufactures including new knitting machines, boarding and other finishing technology as well as a wide range of ancillary equipment and other devices.

In total, the four day event hosted more than 80 exhibitors and welcomed around 3,000 visitors from 67 different countries

Co-organisier Busi unveiled several new developments including Rimaglio 2.0, the re-designed and improved version of the well-known toe-closing device. This 'Classic Linking' system has been developed with several simplifications with respect to the original model, and various other modifications providing an enhanced and more reliable performance.

This involves the device mounted on-board a single cylinder sock knitting machine, on the left-hand side of the machine, so that the knitting technician still has full accessibility to the knitting head.

The sequential operation of the new device starts with the

yarn finger head being raised when sock knitting has been completed. The cylinder then stops in a pick-up position with the help of a mechanical clutch. The knitting head is then raised and the toe-closing device swings across and aligns itself exactly above the cylinder needles.

It is then lowered to a position where pick-up elements position themselves precisely onto these needles. Individual knitted loops are then transferred from the cylinder needles on to the toe-closing

device. The sock is then picked

up and the arm swings the device back into its position underneath the tubular sock-turning piston on the left-hand side of the machine.

The knitting head is closed again and knitting of the next sock commences.

As knitting of the next sock commences, the completed sock is pushed upwards and turned inside out by a sock-turning tube. This means stitching of the toe occurs on the inside of the sock to replicate traditional

linking. Next, two half-crowns, on which the last knitted course is located, close like a jaw superimposing the two halves of the sock toe on top of each other.

Loops from the two separate courses are placed on the same comb. At this point, the sock toe is ready to be stitched closed, and the linking-device starts up sewing the toe area of the sock fabric with stitch-for-stitch linking. Needles pass through the loop twice to give a secure stitch and improve the elasticity of the seam.

After linking, the sock is then straightened and turned with the piston so it is no longer inside out. The sock is moved up toward the piston and waits in the upper part of the ejection tube until the knitting of the next sock is finished.

When the robotic arm moves across to pick up the next sock, the finished sock is then ejected pneumatically from the machine perfectly linked and ready for boarding.

In terms of new machines, Busi unveiled the IDEA Medical (4" diameter x 312N, 26G), a high production single cylinder sock machine with latch needles in the dial to enable it to produce true rib and plain stitch medical compression socks with compression class 1, 2, 3.

Described by Busi as the only machine of its type that can offer five colours per course plus the ground, this now model was also on display equipped with a Rimaglio 2.0 device for toe closing. According to Busi, it is the only company that can offer a true



Busi Idea Medical

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linking toe closing solution with such a fine gauge (26G) and in five colours.

According to Busi, the compression graduation on socks knitted on this machine is achievable through the multistiffening that can be activated at the same time in all the step motors and through the graduation of the feeding of the covered elastic yarn. The selection of needles is made by 8 electro-mechanical actuators that enable the machine to knit a range of structures such as 1x1 true rib welt, double welt and true rib fabric in 1x1, 3x1 and 5x1 etc.

It can also knit embroidery patterns on a mock rib base with five colours per course plus the ground floated yarn mesh patterns in two feeds.

The IDEA Medical is available in diameters 3 1/2, 3 3/4 and 4 ins in gauges 48, 54 and 70G and with 180 to 280 needles.

Also on display was the new IDEA Doppio Terry, a terry version of the IDEA Doppio model, the only single -cylinder machine in the market allowing the production of broad rib (6/2, 10/2 etc.), as with a double- cylinder machines, with the added possibility of embroidery pattern and sandwich terry. Noteworthy here is that the terry device makes it possible to produce plain stitch, half terry and full terry in the same sock without any manual changes required.

At FIMAST, Busi displayed one machine with a diameter of 3 3/4 ins x 200 needles although a 3 1/2 ins model is also available – both of which come in 48G. It was also equipped with the new Rimaglio 2.0 device.

As well as the IDEA Medical and the IDEA Doppio Terry, the new Rimaglio 2.0 device was seen in on several machines including IDEA Doppio, the IDEA J Terry and the new IDEA Terry Medical.

On the Colosio stand, the co-organiser was showcasing the updated faster version of its HT 25 two feed single cylinder machine for the production of men's, women's and children's socks as well as high quality pantyhose. This latest model now incorporates 240 needles and can produce a five colour per course plus the ground in both plain and terry and can knit at speeds at up to 280rpm (plain and 260 (terry).

There is also an optional automatic toe closing device. Available gauges for this machine, described by Colosio as the only double feed machine offering twice as much production compared to other models, are 3 1/4 and 3 3/4 ins.

Colosio also offers an upgraded version of its single cylinder 'Jolly' machine for the



Samples from the Colosio stand

production of very fine gauge socks. The current version can now knit socks and women's fashion tights in up to 54G (3 3/4 ins X 240N) with 3 colours per course plus ground. The Brescia-based company said the new version of 'Jolly' is an evolution of the Regina Jolly and can also knit terry and 3D fabrics in up to 158N.

Also on show was the latest version of Colosio's low-cost, sock knitting machine which now offers a higher needle count and an option to produce tights and other hosiery.

The C15 is a drumless, single-cylinder machine with a single feed for the production of men's, women's and children's socks. It can knit a double or single welt, true heel and toe with five colours per course motif in terry, filet stitch and is available with various options for yarns

feeder and monitoring equipment from BTSR, LGL or others. Knitting speeds are up to 30 dozen pairs of ankle socks per 24 hours at speeds of up to 240rpm.

Previously, available diameters were 3 1/2 ins, 3 3/4 ins or 4 ins with between 84 and 220 needles. Now, the company has added an option to use the C15 for the production of tights on a 4 1/2 ins diameter machine with a total of 276 needles.

At the permanently busy Merz Maschinenfabrik, visitors were attracted to the new CC4II, the 4-feed, single-cylinder machine with reciprocated movement for the production of high quality medical pantyhose and stockings.

The CC4II has all the capabilities of its predecessor but also includes several new elements making it a more productive and easier to use system. As with the CC4, the CC4II available in diameters from 3 3/4 ins up to 6 ins and in gauges ranging from 16G to 41G. However, with improved electronics and a new touch screen function, overall operation has been made more straightforward while it is also equipped with more yarn fingers than its predecessor allowing a more flexible use of yarns – users are able to vary the types of articles they are producing without having to replace the bobbins.

As well as the knitting of typical tubular garments, this multi-purpose machine allows the knitting of speciality articles such as those with a knitted reciprocated heel and/or reciprocated toe.

For Taiwan's Da Kong, FIMAST gave it the opportunity to unveil its new four feed sock



The Merz booth at FIMAST

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knitting machine. The DK-B521 is a fully electronic single cylinder machine for the production men's women's and children's socks in plain mesh terry and sandwich terry with reciprocated heel and toe. Described as an easy to operate machine with low maintenance costs, this 4 ins diameter machine is available from 72 up to 200 needles and in gauges 18, 24, 36 and a very fine 48G.

With seven needle selection groups and four feeder blocks with six yarn fingers, the DK-B521 can knit four feed socks and pantyhose with terry or plain mesh. According to Da Kong, there is also an unlimited pattern field capability of up to three colours on the same course plus a ground colour for a total of up to 13 colours. It can also knit socks with multi coloured stripes, jacquard patterns and patterns with a tuck and filet stitch. A double or normal welt on 2 or 1 feeds or elastic in 2 or 1 feeds can be inserted in various points in the sock.

Also new from Da Kong is the DK-B501 an electronic single cylinder machine for the production of pelerine socks. This model is able to knit men's, women's and children's socks in stitch transfer and plain knit with two feeds and in seven colours while eight actuators provide needle by needle electronic selection. By substituting the transfer jacks with needles, sock mills can also produce plain socks with the same choice of both colours and patterns.

Electronic shaping for both the heel and toe is possible without mechanical pickers while the use of step motors allows the sinker position and stitch cam formation to be regulated allowing stitch widening and narrowing at any part of the sock.

The DK-B501 is available in three different diameters – 3½, 4 and 4½ ins – in 18, 24 and 36 gauge and in needle counts ranging from 56 on the 18G model to 120 on the 36G, 4½ ins model.

Japan-based machine builder Nagata Seiki presented its updated D-100, a single feed, double cylinder broad rib and links/links knitting machine which is now equipped with a newly developed cam constriction and yarn guide mechanism to improve efficiency while also reducing energy consumption.

Nagata Seiki describes the D-100 as having a machine body that is smaller and lighter which helps reduce energy usage which in turn offers sock knitters the opportunity to lower the overall costs of sock production. Moreover, compared with Nagata's previous model, the D-211, this



The trends area at FIMAST



Da Kong presented two new machines including the DK B521

model consumes around 50% less compressed air per hour.

During the research and development stage for this machine, the whole mechanism of the cylinder drive was enhanced, the result of which was increased energy efficiency from the installation of a small servo-motor. The electromagnetic valve system and piping system have also been revisited and this has made it possible to operate the cams with a small sized electro-magnetic valve.

In terms of stitch quality, fine adjustments can be made via a pulse motor. Partial stitch is operated via air cylinders which makes it easier to control knitting data for adjustments to the balance of stitches for certain pattern requirements.

The data system also allows the knitter to control the heel/toe knitting parameters. In effect, when creating a high or wide heel, this allows the machine operator to increase and



The D100 from Nagata Seiki

decrease the number of needles by up to 1/20 of the number of needles without a rearrangement of the sliders.

The D-100 is available in 3½, 4 and 4½ ins diameters. The 3½ ins version has between 104-240 needles, knitting in 24-50G, while the 4 ins model has 120-240 needles, in gauges 24-50G and the 4½ ins diameter has 72-100 needles knitting 6G.

Also on display was the K-172, a single feed, single cylinder sock knitting machine that is capable of knitting motif patterns with 5 colours per course plus the ground yarn. This machine also carries Nagata Seiki's heel/toe knitting system which includes a simplified cam box that has been redesigned to increase machine speeds while incorporating graduated stitch construction. Diameters start at 3¼ and go up to 4 ins in gauges ranging from 24-54G.

A report on new ancillary equipment at FIMAST will feature in the next issue. KTJ