TECHNICAL INFORMATION

Initial sampling/testing of programme =
Shima Seiki 122 S (10 gauge) Knitting single system.

Final samples/full size knitted bodies =
Shima Seiki SWG First ® 184L (7 gauge - knitting split gauge)
Knitting single system. www.shimaseiki.co.jp

Yarn =
Zegna Baruffa Cashwool NM. 2/30 100% Extrafine Wool (Virgin Wool)
(Knitting with 2 ends) www.baruffa.com

TECHNICAL DEVELOPMENTS MADE THROUGH RESEARCH

Drawstring edge, when knitting split gauge
Giving a very neat finish on toes, mitten ends and thumbs when knitting split gauge (on every other needle).

When knitting in split gauge the press off start does not give a neat edge, as it does when used on full needle knitting. To get the edge neat and tight when knitting split gauge you would usually use a high twist yarn, or put elastomeric in the first row (set up row). This development enables you to get a very neat finish and improve shaping when using any yarn.

The drawstring edge is achieved by the addition of 1 row knitted on the back bed needles only before the usual set up row (press off start), where 1 row is knitted on all needles.

Knit as follows:
After knitting waste yarn change to main yarn.
Knit 1 row back bed needles only.
Knit 1 row all needles
Continue in tubular (circular) knitting
When finished knitting remove the waste yarn and pull the first row, knitted on back bed needles only, tight.

Achievement of detail, in face, whilst mainting fabric quality

This is a very notable technical development. To achieve such detail and three-dimensional shaping you would normally use a high twist yarn or elastomeric, and knit very tightly. This was not possible, as I wanted the pieces to be very obviously knitted. I also wanted to use wool to further emphasis the knitted quality of the work. I wanted the knitted stitch to show so we had to knit relatively loosely and split gauge (on every other needle) to get a larger stitch.

This technical development would be very useful in developing a better fit for medical and other protective facial masks especially when using technical yarns such as Lyocell, which are not stretchy, and where elastomeric cannot be used because it impedes the function of the yarn or mask. Lyocell is made from cellulose fibre. When wet it turns to jelly. When knitted into a facial mask it can be used in the protection and treatment of burns.

The detail and three-dimensional shaping was achieved in the following two areas.

Three-dimensional chin

This development builds on the Experimental Officer's past experience of knitting medical masks. Here he has developed a truly three-dimensional chin by the use of partial knitting (flashage), as used in the knitting of sock heels, and the incorporation of interlock (birdseye) in the under part of the chin. The top and bottom part of chin are of equal size but the use of interlock in the lower part of the chin makes the fabric firmer. This enables the looser top part of the chin to stick out further. The interlock stitch is not visible; it simply gives more structure to the knitted fabric.

The machine is knitting split gauge so the top part of the chin is knitted on every other needle, where as the lower part of the chin is knitting every third needle and knitting interlock (birdseye) every third needle.

Three-dimensional nose

To achieve a truly three-dimensional nose the nose area is knitted full needle (on all needles) birdseye (interlock), whereas the rest of the face is knitted split gauge (on every other needle).

To achieve the shaping more rows are knitted on the nose than on the face. This is done through the use of a holding technique. For the top of the nose 3 rows are knitted in the nose area (full needle birdseye) to 1 row on the face (split gauge). For the widest part of the nose up to 7 rows are knitted in the nose area (full needle birdseye) to 1 row on the face (split gauge). This process pushes the capabilities of the machine to its limits. Every possible feature of the machine is employed to keep the stitches on the needles; Stitch Pressers (for holding down the fabric), Loop Pressers (for holding down the individual loops), Contra-sinker (distributing the yarn tension more evenly), Takedown Rollers (main rollers and sub rollers) and Pulldown Device.

To prevent holes appearing where the nose meets the face the stitches either side of the nose are transferred back into the face (split gauge) area.