

## CONTOUR KNITTING MACHINE II

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| Project manager:                       | F. Helbig, Dipl.-Ing. | Duration: 05/96 - 06/97 |
| Authority responsible for the project: | BMW - Gewiplan        |                         |
| Project number:                        | 289/96                |                         |

### Initial situation

A large range of new fields and possibilities of application, the scope of which cannot fully be foreseen yet, is to be expected for the rapidly expanding sector of industrial textiles. On the basis of a patent application (EP 0748889 A 2), development work was carried out in respect of the contour knitting machine with the aim to ensure the flexible manufacture of differently designed textile semi-manufactures. This development work is based on the 1 : 1 rib double-needle bed raschel knitting machine, type HDR 6-7 DPLM, made by Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, that had been acquired already within the framework of the "Contour Knitting Machine" research project (Reg.-No. 569/94).

### Research target

The basic task in the further development of the method for the manufacture of complex three-dimensional textiles by knitting, featuring extremely diverse design possibilities is to create, by textile-technological and textile production-technological means, textile structures that meet the requirements of a large range of applications.

### Research result

After extensive investigations into the most favourable applications for contour knit fabrics, the following partial tasks were determined:

- enlargement of the possible racking paths of selected guide bars
- development of weft thread laying devices
- increasing the number of guide bars
- provision of variable fabric take-down conditions.

These partial tasks were fulfilled technologically within the course of the research project. While the production-technological fundamentals were examined within the scope of a first development stage, four guide bars were provided with linear motors as direct drives at a second stage. In this way, it was possible to distinctly extend their patterning potentials and to increase their racking paths. In addition, various thread laying systems were developed and employed at the respective development stages with the aim to create reinforced textiles by the direct incorporation of highly modular long fibres. Although the method developed and the associated technological modifications required specific equipment of the processing machine, the essential production-technological basic functions of knitting as well as the basic structure of the machine were retained and flexible outfit and retrofit for making the most diverse textile semi-manufactures with final contours close to those desired were made possible. Examples of such textiles, partly finished with various matrices, were shown by the person in charge of the project at the Techtext 1997 exhibition.

### Application and economic advantages

Thanks to the advancement of the equipment for the manufacture of complex three-dimensional textile semi-manufactures, it is possible for those engaged in the manufacture and application of such textiles to ensure precise processing machine specifications. The prerequisites for determining, in each individual case, the optimal machine outfit for the effective production of different textiles are thus provided. In addition, the contour knitting machine enables the investigation and testing of state-of-the-art digital driving and control equipment for decentralized driving systems on textile machines - a basic development trend that has also made its appearance in textile machine engineering.

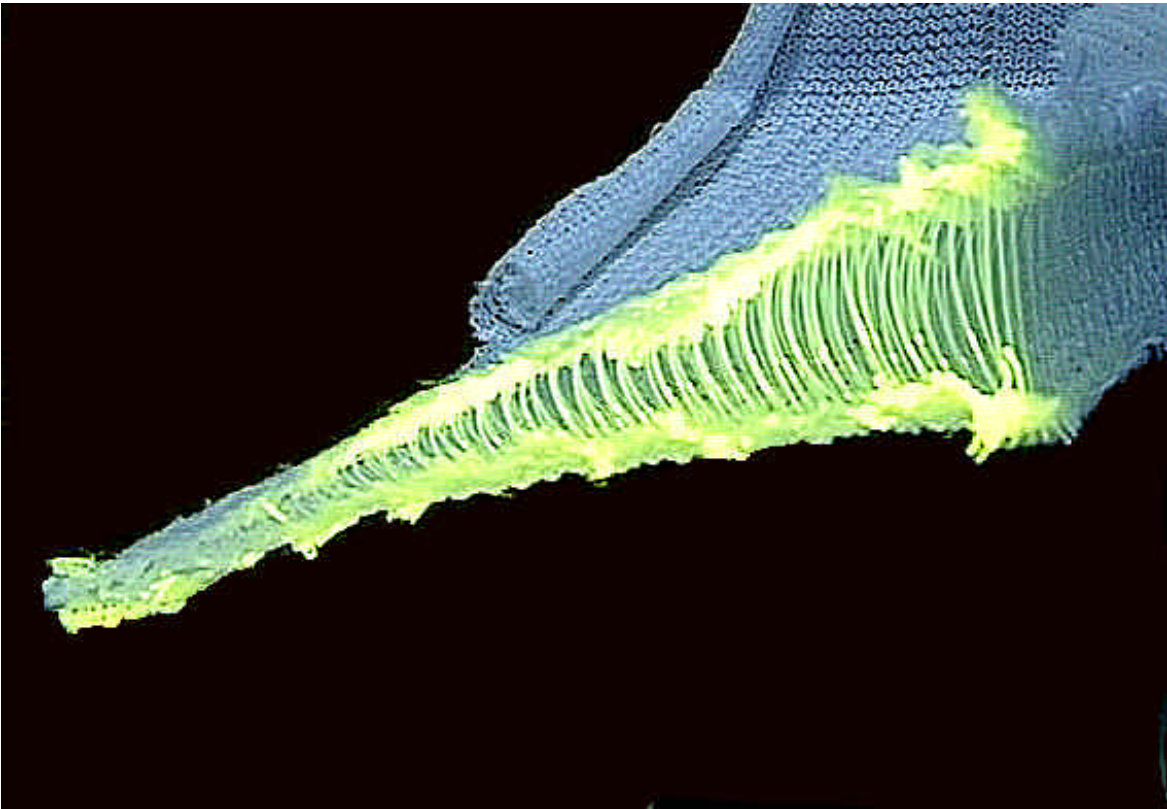


Fig. 1: Contour knit fabric with wedge-shaped profile