

MECHATRONIC TEXTILE MACHINERY

Project manager: Dipl.-Ing. J. Födisch

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Initial situation

Future machine developments are primarily based on the integration of computer science, information technology, electronic engineering and mechanics to form mechatronics as a key technology of the 21st century. The textile machine building sector in Saxony needs innovation as a starting point for future economic activities. In this context, the use of mechatronic systems in textile machine construction is an important factor of innovation, as it is aimed at developing flexible and state-of-the-art technologies for making novel textile products.

Research target

To use mechatronic systems in textile machinery on a general scale, textile engineers and production engineers as well as operators should not be directly involved in the programming required for setting and running the machine. Now as before, textile products should be developed only by textile engineers using their comprehensive know-how. To optimally transform patterns into textile products, operating surfaces should be developed which contain typical tools meeting all basic textile-technical and technological requirements.

Research result

Integrating the required technological and machine-specific motion sequences in information processing and drive control systems results in the creation of operator interfaces largely oriented towards the respective machine categories. The R&D work performed leads to the conclusion that the developed mechatronic systems may be reasonably used in a combination of servo drives and CNC for textile machine driving systems that must meet special technological flexibility requirements. As there is an increasing demand for more flexibility in the manufacture of new and innovative products, R&D results form an important basis for their targeted implementation on other types of textile machines.

Application and economic advantages

The modified concept of a double raschel machine was successfully implemented in a prototype system for making open three-dimensional warp-knitted fabric structures for long fibre reinforced concrete elements. The corresponding machine was developed by Cetex and supplied to the Special Department for Concrete Research of the Aachen Rhenish-Westphalian School of Technology (RWTH Aachen). Weft insertion devices for multiaxial webs processed on stitchbonding machines were developed in cooperation with Siemens AG - ZN Chemnitz and have been successfully implemented several times since the machine was presented by Karl Mayer Malimo Textilmaschinenfabrik GmbH at ITMA 1999. The marketing possibilities of the PRN 500 circular sewing device which Cetex developed and built for the Institute of Textile and Apparel Technology of the Dresden University of Technology, may be evaluated after it has been presented at the IMB 2000 in Cologne.

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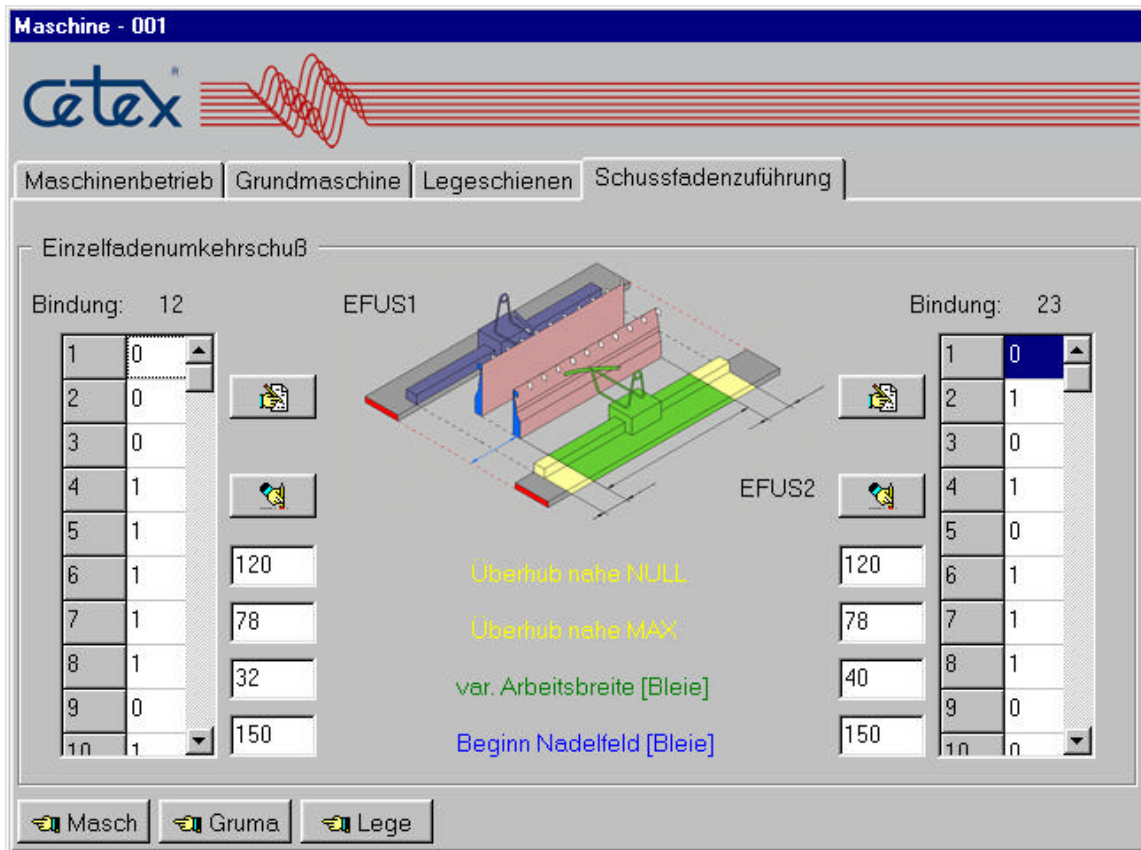


Figure 1: Operating surface of the modified double needle bar raschel machine for parametrization of the weft laying systems



Figure 2: General view of the programmable circular sewing unit