

DEVELOPMENT OF NEW ABSORPTION TEXTILES USING RECYCLING MATERIALS (RESORP)

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Duration: 01/02 – 12/03

Initial Situation

The research project at hand concerns the development of new absorption capable textiles that are to be produced with the use of recycled materials, old leather, for example. No known methods or machines are presently capable of producing such a textile.

Research Goal

The main goal of this project was the development of an absorption textile through the use of recycled materials. This resulted in the necessity of a mechanical engineering system solution: the development of a prototype installation fit for the production of these products and their technological optimisation. Essential tasks to be fulfilled by Cetex gGmbH included:

- The formulation of a basic process methodology
- The blueprint and construction of a mechanically functional model
- The optimisation of related technology
- The blueprint and construction of a prototype

Research Results

The sewing of an absorption layer between the deck sheets on a stitch-bonding machine proved to be a fitting technology for the production of absorption textiles using recycled materials (see fig. 1). In further investigations, granulated leather and a polypropylene web proved fitting materials for the absorption layer; a polypropylene web was suitable as fitting material for the upper and lower sheets.

Essential in the execution of this process is a stitch-bonding machine from the firm KARL MAYER Malimo Textilmaschinenfabrik GmbH (otherwise known as Malimo GmbH). The model is a 14022/A with the working width of 1.600 mm. The first attempts were carried out with an older style of stitch bonding machine that also belongs to the firm Malimo GmbH with a maximum working width of 2.400 mm.

The technology can be described by the following sub-functions (also view fig. 2):

- Metering and storage of granulated leather material
- Loosening the granulated leather material
- Crosscutting of the mats

Corresponding to these sub-functions, similar types of methods and machines were investigated, namely, methods of chipboard production and cotton processing. The compatibility of regulations derived from similarities, fit for sub-functions in special cases, can be demonstrated with the use of a functional model. As a result of the investigation, a functioning prototype construction is available which is fit for the production of absorption textiles.

Applications and Economic Implications

The area of use provided by the research results can be doubled regarding the use of bulk good like fibre materials for filling with the support of a textile belt fastened by the stitch bonding process.

The developed product is judged according to industrial specific market criteria during the entire project phase so that the establishment of corresponding market affects can be directly incorporated in the research and development.

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The overall goal of the project: the development of absorption textiles with the use of recycled materials is comprised of a multiplicity of positive ecological potential. Through the use of recycled materials, the political and environmental goal of recirculation will be fulfilled by directing as much possible refuse into a second cycle. Further, the product is employable for an extended amount of time, an essential point contributing to the protection of the environment. This will be achieved through use of microbial oil-aromatics. A further development of the machine and product concept, enabled by the knowledge attained of various fill and casing materials, can also be ascribed as potential.

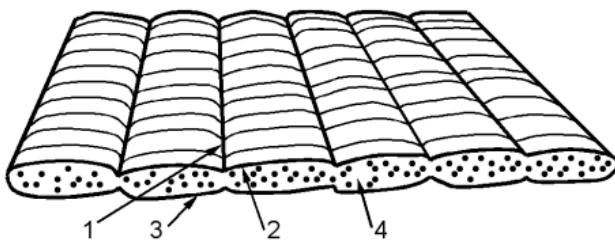


Figure 1: Product Composition

- 1 Seam
- 2 Upper Cover Stream
- 3 Lower Cover Stream
- 4 Absorption Layer

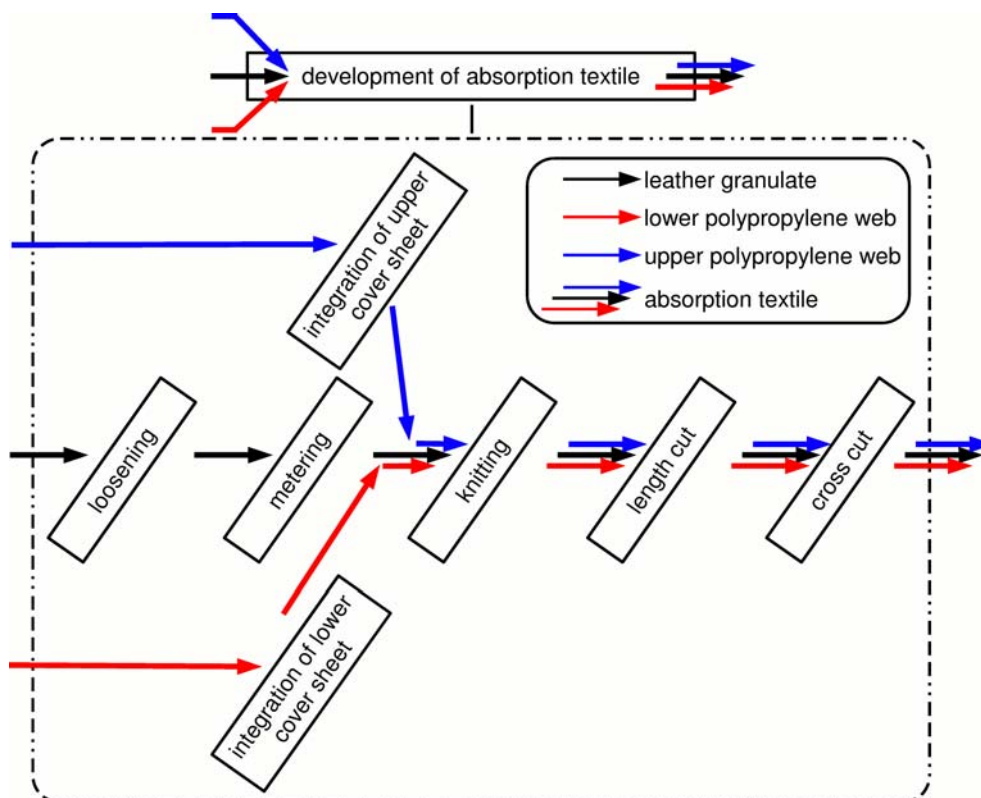


Figure 2:
Functional Design