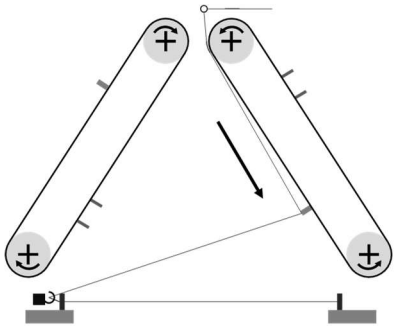
INNOVATION | RWTH AACHEN UNIVERSITY

RWTH Technology

High speed weft insertion for warp-knitting machines



Challenge

The industry of technical textiles is a constantly growing one. Especially in the field of aerospace, civil engineering and mobility technical textiles play a significant role. Besides woven textile structures especially bi-axial or multi-axial warp-knitted fabrics are being used.
Bi-axial as well as multi-axial warp-knitted structures are manufactured on special warp-knitting machines with at least one module for weft insertion. The productivity of these machines is significantly limited by the weight and trajectory of the module which is used for the transportation of the weft yarn(s). Compared to warp-knitting machines without weft insertion a reduction of maximum production speed of up to 3000 /1min has to be taken into consideration by the manufacturers (1.400 1/min compared to 4.400 1/min).

Solution

The developed technology is based on the use of a system of belt drives which are used for the transport of weft yarn. This technology shall enable manufacturers to produce warp-knitted fabrics with weft insertion at speeds of up to 4400 1/min (resulting in an increase of productivity of up to 200 %).
The trajectory of the weft yarn is optimized in a way that frictional contact is reduced to a minimum. Hence even the processing of brittle and high-modulus yarns (such as carbon or glass fibers) shall be possible at high productivity.

Advantages

- Significant increase of productivity
- Significant reduction of energy consumption
- Reduction of length of the weft-knitting machines, resulting in more machines on same space

Status

- Patent application filed
- Proof of concept on lab-scale; Scale-up to true process in progress

RWTH Aachen University is looking for partners for patent exploitation and for research partners for joint development.

RWTH Innovation GmbH

RWTH Technology
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Fields of application
Textile machinery,
Technical Textiles,
Compo-sites

Keywords
#Weft insertion, #warp-knitting, #textile machinery, #productivity, #low friction

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