

PNEUMATIC FABRIC GUIDE

Project Manager: Dipl.-Ing. D. Gläser Duration: 05/95 - 07/96
Authority responsible
for the project: BMWi - Gewiplan
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Initial situation

Fabric guides consist of roller pairs which are arranged in the zone of the fabric selvages and stand diagonally to the passage of the cloth. Because of the shock effect of the straightening power and the power attack in a lined form there are quality reductions in sensitive knitted fabrics and silk fabrics. Fabric guides are often combined with selvedge spreaders which can get to more quality reductions.

Research target

By pneumatic guiding the necessary power to guide the fabric should be spread across a larger zone. In this way the use of the fabric should be reduced. Rays of air should roll out the selvages. The researches were done to the following directions:

- fundamentals for a pneumatic fabric guide basing on physical and experimental researches, construction and tests of prototypes
- optimising the arrangement of a pneumatic fabric guide within the fabric run
- behaviour in operation and field of application of a pneumatic fabric guide with different kinds of fabric, comparison to customary fabric guides

Research result

It was possible to prove that guiding of fabric is possible by rays of air. The advantages of the pneumatic fabric guiding were proved: „spread of the power attack across a larger zone of the fabric, removal of turned up and rolled up selvages without any additional equipment“. The results of the experiment all can be assessed as good. The prototype consists of two fabric guide heads which operate within the zone of the fabric edges. Each of these heads has a self-contained air circulation. The nozzles have such a length that the straightening power effecting to the fabric is spread across a large zone of the fabric selvage. The pneumatic fabric guides have a simple structure. In connection with that are:

- a simple production and a small price
- easy operation and maintenance and barely wearing parts

The pneumatic fabric guide is usable for the most woven and knitted fabrics. It's not usable for fabrics very permeable to air (curtains) and fabrics with great cross stiffness (some bonded fibre fabrics). The maximally adjustable shift of the fabric is with small fabric tensile load (50 N) 150 mm. It is independent of the fabric pace and drops with an increasing fabric tensile load. The reached guiding precision is in the same order as in using mechanical fabric guides. The fabric tensile load has no effect to the guiding precision.

Application and economic advantages

The possible using range of the pneumatic fabric guide is much wider than initially expected. In surface instable articles the well-known fabric guiding is usable only with restrictions or partly not usable at all. The pneumatic fabric guide closes an existing gap in textile finishing. It is used in articles with high quality how they are processed mainly by the German resp. European textile industry and for which till now there are no practicable solutions. Further the pneumatic fabric guide is because of its expected lower price a favourable alternative to the constructions used at the moment.

An enterprise from the newly-formed German states already showed interest in the production and the distribution of the fabric guide. The fabric guides will be tested until the mid of 1997 in a textile enterprise in Saxony at an existing finishing equipment.

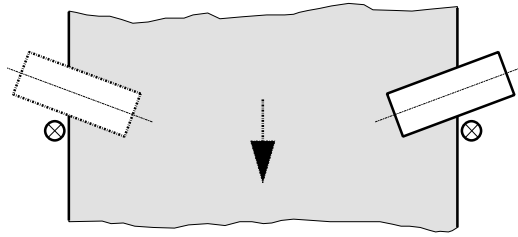


Fig. 1: Present fabric guiding by roller pairs

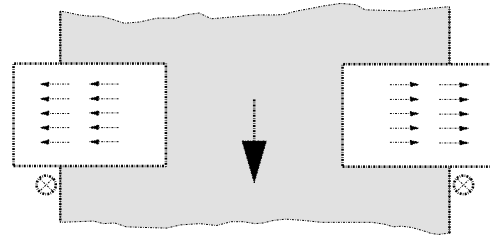


Fig. 2: Targeted fabric guiding by air jets

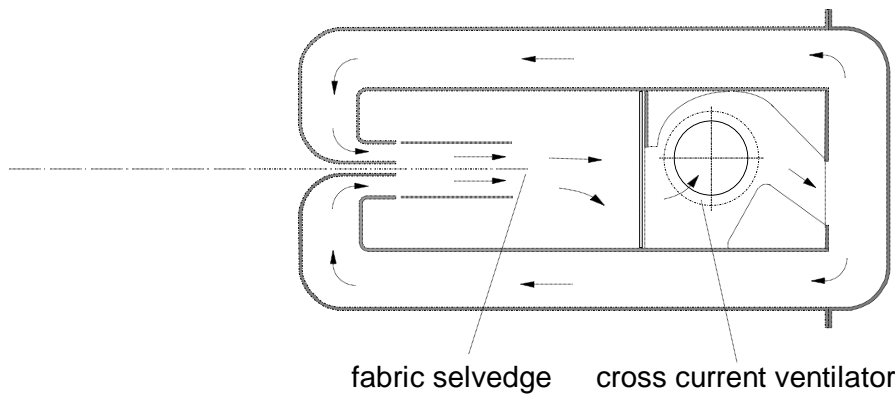


Fig. 3: Air guiding at the prototype in working position

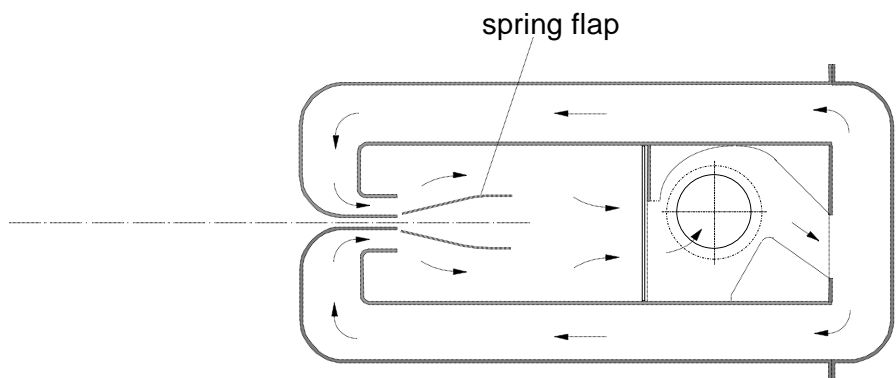


Fig. 4: Air guiding at the prototype in inoperative position

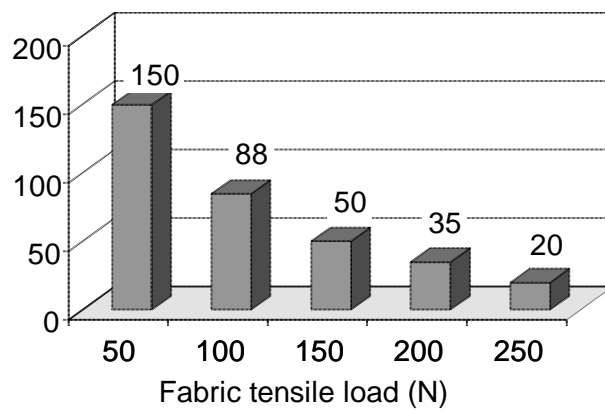


Fig. 5: Maximally possible shift (mm)