

Analysis and Control of Camera Type Weft Straightener

Authors : Jae-Yong Lee, Gyu-Hyun Bae, Yun-Soo Chung, Dae-Sub Kim, Jae-Sung Bae

Abstract : In general, fabric is heat-treated using a stenter machine in order to dry and fix its shape. It is important to shape before the heat treatment because it is difficult to revert back once the fabric is formed. To produce the product of right shape, camera type weft straightener has been applied recently to capture and process fabric images quickly. It is more powerful in determining the final textile quality rather than photo-sensor. Positioning in front of a stenter machine, weft straightener helps to spread fabric evenly and control the angle between warp and weft constantly as right angle by handling skew and bow rollers. To process this tricky procedure, the structural analysis should be carried out in advance, based on which, its control technology can be drawn. A structural analysis is to figure out the specific contact/slippage characteristics between fabric and roller. We already examined the applicability of camera type weft straightener to plain weave fabric and found its possibility and the specific working condition of machine and rollers. In this research, we aimed to explore another applicability of camera type weft straightener. Namely, we tried to figure out camera type weft straightener can be used for fabrics. To find out the optimum condition, we increased the number of rollers. The analysis is done by ANSYS software using Finite Element Analysis method. The control function is demonstrated by experiment. In conclusion, the structural analysis of weft straightener is done to identify a specific characteristic between roller and fabrics. The control of skew and bow roller is done to decrease the error of the angle between warp and weft. Finally, it is proved that camera type straightener can also be used for the special fabrics.

Keywords : camera type weft straightener, structure analysis, control, skew and bow roller

Conference Title : ICMMME 2017 : International Conference on Mechanical, Mechatronics and Materials Engineering

Conference Location : Miami, United States

Conference Dates : March 09-10, 2017