Analysis of automated G-clip machine processes and substation process with simulation by using CAD software

ABSTRACT

The paper presents the work of analysis of Automated G-clip Paperclip machine of using Solidworks Simulation and a comparison between results of each analysis in cutting process using design of experiment (DOE) and followed by design verification of simulating the cutting process after design changes. It emphasizes on the analysis of process and additional substation process to overcomes current machining problem. The current problem is occurred at the cutting station, which lead to poor quality product. There is two-design stage, which is preliminary of design of experiments conducted in order to fulfill the design validity and design verification. Application of longitudinal cyclic transfer system in feeding with pre-straightener substation is implied for comprehensive feeding of the wire with 1.3 mm diameter in 2 second. Forming dies with stepper motor controller give the precise positioning and repeatability of movement since good stepper motors have an accuracy between 3 5% of a step and this error is non-cumulative from one step to the next. By incorporating the new station in simulation procedure for this machine, it shows that the product quality is improved.

Keyword: Automated machine; Design of experiment; Finite element analysis; Quality