설계공간 조정과 세분화를 이용한 너클의 위상최적설계

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Topology optimization for a knuckle using design space adjustment and refinement

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Key Words: topology optimization(위상최적화), design space optimization(설계공간 최적화), knuckle(너클), large-scale problem(대규모 문제)

Abstract : Evolutionary topology optimization using design space adjustment and refinement is used to optimize a knuckle in the suspension system of an automobile. Design space optimization used in this paper is a new efficient method for large-scale topology optimization by virtue of two reasons. First, the design space adjustment including multi-layer design space expansion and reduction is suitable for large-scale problems by virtue of its evolutionary nature. Second, the design space refinement can be done locally or globally when and where necessary and thus is very effective in obtaining a target resolution with much less number of elements. Minimum compliance for a knuckle is considered with the actual working condition to show the effectiveness and superiority of the new approach.

칩마운터용 직진 구동 테이프 피더 동특성 평가

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Dynamic Characterization of Tape Feeder for Chip Mounter

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Key Words: Tape Feeder (칩 공급장치), Chip Mounter (PCB 자동 조립 장치), Linear Driving System (직진 구동장치), Acoustic Signal(음향 신호)

Abstract : The paper reports that the tape feeder of chip mounter with a new concept was mechanically designed and its performance was evaluated. We originated linearly driving module for tape feeding in stead of sprocket rotating device in order to correspond to the very small chip mounting market. The paper describes its mechanism and its dynamic evaluation in detail. Also we measured chip locating precision degree after long time operation. As a result, the feeder showed very good performance with high precision for chip location. However, the feeder was dynamical unstable, which caused the chip to bounce out of the tape. So the dynamic characteristic was evaluated by using acoustic signal analysis. The design of the transporting device was then modified to the sliding cam according to the results of the analysis. The paper shows the dynamic characteristic of the modified device for chip transportation.