The Study of Tool-path Generation for a Spatial Cam ’s Roller Guide

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ABSTRACT

The purpose of this study was to use milling tool smaller than the roller guide to replace same diameter with the guide-way width milling tool in the processing and manufacturing of spatial cams. In addition to effectively solve processing and manufacturing problems on the production line, this approach could also reduce the cost of milling tool and enhance the production efficiency. This study also applied computer aided manufacturing (CAM) to create a holonic manufacturing technique for spatial cams smaller than the roller guide. The research contents included: precision of curve is cut apart, NC tool path generation of same diameter with the guide-way width milling tool, and NC tool path generation of small-sized standard milling tool. To derive the NC tool path of spatial cams, a 2-dimensional analysis was required. By converting the figures into machine coordinates, the program codes of the NC tool path could be obtained. As for the tool path of small-sized standard milling tool, the offset theory was applied in the analysis and estimation. The coordinates of the two sides of the tool path were estimated to ensure that every processing point of the small-sized milling tool is located within the cutting range of same diameter with the guide-way width milling tool. According to the research content, a complete computer aided system for NC tool path of spatial cams was compiled. The multi-axis NC simulated milling software was later used to perform reverse simulation of practical milling of spatial cams. The simulation result was compliant with the motion range of same diameter with the guide-way width milling tool. In addition to providing a spatial cam processing and manufacturing technique which could shorten the processing time and manufacturing cost, this study also integrated CAM and practical manufacturing experiences to establish a complete processing model.

Keywords : Cylindrical Cam, Tool Path, CAM

Table of Contents

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