The tool-path generation of tapered groove for a cylindrical cam.

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ABSTRACT

This paper presents a system for the design and manufacturing of cylindrical cams to cut the roller groove. In the proposed system, a new interference-free tool-path 3D regenerating method was applied for four-axis machining of wide roller guide. Eleven various types of follower motion for a translating and oscillating follower are considered. This proposed 3D offset-based generating method can regenerate tool-paths for standard cutting tools instead of larger ones and implemented on computerized CAM system. Examples with wider grooves are demonstrated to prove its effectiveness. The analyses include: comparing the result of the simulation by using conventional tool-path and regeneration method tool-path, cutting precision of the curves, measuring the lifting angle and cam diameter deviation, and discussing the possibility of occurring of the ahead cutting. With these factors, the diameter of the tool and cam diameter have relatively limited condition. In order to verify the actuality of the simulation satisfying the processing precision, an entity of the cylindrical cam is made for comparison. The result of the computer simulation with the actual processed product proves that the theory developed is applicable.

Keywords : Cylindrical Cam、Tool-path、error

Table of Contents

第一章　緒論.....1 1.1 研究動機與目的.....1 1.2 文獻回顧.....2 1.3 論文架構.....7 第二章　凸輪基本理論.....10 2.1 空間凸輪簡介.....10 2.2 運動曲線圖之定義.....11 2.3 運動曲線特徵值.....13 2.4 運動曲線之種類.....14 2.4.1 使用符號說明.....15 2.4.2 簡諧曲線.....15 2.4.3 擺線曲線.....16 2.4.4 修正梯形曲線.....17 2.4.5 修正正弦曲線.....19 2.4.6 修正等速度曲線.....21 2.4.7 多項式曲線.....23 2.4.8 SHP-50.....25 2.4.9 雙諧和曲線.....26 2.4.10等速度曲線.....27 2.4.11等加速曲線.....28 第三章　加工刀具之數值加工路徑生成.....30 3.1 等徑刀具之數值加工路徑簡介.....30 3.2 加工機結構與分析.....31 3.3 圓柱曲線展開與精度分割.....33 3.4 等徑刀具之加工路徑生成.....37 3.5 轉換機械座標.....43 3.6 小尺寸形刀具之偏置與路徑生成.....45 3.7 轉換數值加工碼.....52 第四章　四軸加工機加工圓柱凸輪.....59 4.1 CNC四軸加工機簡介.....59 4.2 Alpha CUT機台建立.....61 4.3 設計實驗.....62 4.4 模擬加工.....63 4.5 實體切削.....69 4.6 實驗結果.....79 第五章　四軸加工機圓錐導槽加工模擬.....82 5.1 圓錐形導槽路徑生成.....82 5.2 模擬加工與分析.....82 5.3 模擬結果.....92 5.4 凸輪滾子槽之超前切削.....92 第六章　結論.....95 參考文獻.....97 附錄A　直徑100mm等徑刀具加工NC碼.....102 附錄B　直徑100mm小刀2D路徑加工NC碼.....104 附錄C　直徑100mm小刀3D路徑加工NC碼.....106 附錄D　直徑120mm等徑刀具加工NC碼.....109 附錄E　直徑120mm小刀2D路徑加工NC碼.....111 附錄F　直徑120mm小刀3D路徑加工NC碼.....113

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