

عنوان مقاله:

Survey and Effects of Manufacture and Assembly Errors on the Output Error of Globoidal Cam Mechanisms

محل انتشار:

فصلنامه فرایندهای نوین در ساخت و تولید, دوره 4, شماره 4 (سال: 1394)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

The output error of the globoidal cam mechanism can be considered as a relevant indicator of mechanism performance, because it determines kinematic and dynamical behavior of mechanical transmission. Based on the differential geometry and the rigid body transformations, the mathematical model of surface geometry of the globoidal cam is established. Then we present the analytical expression of the output error (including the transmission error and the displacement error along the output axis) by considering different manufacture and assembly errors. The effects of the center distance error, the perpendicular error between input and output axes and the rotational angle error of the globoidal cam on the output error are systematically analyzed. A globoidal cam mechanism which is widely used in automatic tool changer of CNC machines is applied for illustration. Our results show that the perpendicular error and the rotational angle error have little effects on the transmission error but have great effects on the displacement error along the output axis. This study plays an important role in the design, manufacture and assembly of the globoidal cam mechanism.

کلمات کلیدی:

Globoidal cam mechanism, Manufacture error, Transmission error, Automatic tool changer

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