

论文

无侧隙双滚子包络环面蜗杆真实啮合齿面的理论研究

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摘要:

为获得无侧隙双滚子包络环面蜗杆三维真实啮合齿面,基于空间啮合原理建立了无侧隙双滚子包络环面蜗杆传动的数学模型,推导了蜗杆传动的齿面接触螺旋线方程. 该方程与Pro/ E 软件结合,获得无侧隙双滚子包络环面蜗杆的真实啮合齿面. 在此基础上将利用Matlab 软件计算得到的蜗杆接触线与Pro/ E 软件拟合得到的蜗杆齿面对比分析. 结果表明:蜗杆齿面拟合精度由蜗杆齿面接触螺旋线条数决定,当螺旋线为9 条时,所获得的齿面反映了蜗杆的真实啮合齿面,拟合精度达到0. 001 00 mm.

关键词: 真实齿面 无侧隙 双滚子包络环面蜗杆 啮合原理

Theoretical Study on Real Tooth Surface of Non-backlash Double-Roller Enveloping Hourglass Worm

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Abstract:

To acquire the real tooth surface of the non-backlash double-roller enveloping hourglass worm, a mathematic model for the non-backlash double-roller enveloping hourglass worm gearing was established according to the space meshing theory, in which the contact helix line equation of the worm gearing was derived. On the basis of the contact helix line equation, Pro/ E software was used to produce the real tooth surface of the non-backlash double-roller enveloping hourglass worm. Then, the contact helix lines acquired by Matlab software were compared with the tooth surface produced by the Pro/ E software, to analyze the influence of the number of contact helix lines on the tooth surface fitting precision. The results show that the fitting precision of the tooth surface is determined by the number of contact helix lines, and that the tooth surface acquired by the proposed method can exactly reflect the real meshing tooth surface, with the fitting precision being 0. 001 00 mm, when the number of helix lines is nine.

Keywords: real tooth surface non-backlash double-roller enveloping hourglass worm meshing theory

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