

偏心链轮传动机构的运动学分析及参数优化 Kinematic Analysis and Parameter Optimization of Eccentric Sprockets Transmission Mechanism

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摘要: 针对偏心链轮传动机构工作过程中链条松紧变化大的问题设计了偏心张紧轮。通过优化张紧轮的转动中心位置、偏心量和初始角位移,使链条在周期中始终处于张紧状态。利用微分对该传动机构进行了运动学分析,列出了主、从链轮角位移关系的求解方程,并以此为基础,进行了传动系统的运动学分析和张紧轮的轮心坐标、初始相位角和偏心量的优化计算,其目标是在周期中使链条松紧波动最小。列出了优化实例,在优化过程中考虑了链节长度的非连续性。 Aiming at the large fluctuation for chains length of two eccentric sprockets transmission mechanism at work, an eccentric tensional sprocket was set. The chains were always in tension through the optimized revolving center, eccentricity and initiatory phasic angle of the eccentric tensional sprocket. By kinematics analysis with differential equation, the relation equation of angle displacement between the main sprockets wheel and subordinate sprockets was obtained. Then, the optimization calculation for the position of rotary center, initiatory phasic angle and eccentricity of the tensional sprocket was accomplished, with a view of the minimal degree of tightness fluctuate of chain. An optimizing example was present. Furthermore, the consideration for the non-continuity of chain length was taken into in optimization.

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