Abstract

This paper is a research in pitch line design on the gear with variable ratio. The variable ratio gears give first place to noncircular gears. Gears with noncircular pitch curves are called noncircular gears, and thus including elliptical gears. This paper is a research of noncircular gear related with variable ratio. Based on the differential geometry, tooth contact analysis, curvature theory, the principal directions and curvatures of the mating tooth surfaces, the pitch curves and tooth profile of contact ellipses are investigated. The numerical results and manufacturing noncircular gear confirm the theoretical models proposed for theorem proposed in this current paper. This paper provides a valuable reference for the theorem, the design and machining of this gear type.

Keywords: noncircular gear, variable ratio, pitch radius