

# **Innovative Design of Cam-Controlled Planetary Gear Trains**

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## **Abstract**

The objective of this paper is to perform the innovation design for the new structures of cam-controlled planetary gear trains (CCPGTs), based on the creative mechanism design methodology. Firstly, the design requirements and design constraints are summarized according to the kinematics characteristics of existing CCPGTs. Then, the (4, 5) and (5, 7) graphs are generated by the theory of number synthesis. After that, the atlas of feasible specialized graphs is obtained. Finally, the atlas of new designs is obtained through the particularization process. In addition, an illustrated example is given, and the feasibility of the design is verified by computer simulation using ADAMS software. The result indicates that new design can produce a more wide range of non-uniform motion than the existing design. Therefore, they are better alternatives for driving a variable speed input mechanism.

**Keywords:** planetary gear train, cam, innovation design, variable speed mechanism

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