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PARAMETRIC DRAWING OF A CYCLO DRIVE SHORTENED EQUIDISTANT EPITROCHOID GEAR

Abstract: *Cycloid profile gears have very good working characteristics in both kinematic and dynamic domains. The most frequently used profile of cycloid gears is an equidistant of the shortened epitrochoid. These types of gears commonly have convex on concave contact surfaces, which influences the decrease in stress as well as contact wear. Given that this is a complex curve, this paper gives a program code made in AutoLISP for its automated generating in AutoCAD. Using the input parameters of the cycloid disc the program creates a two dimensional drawing of the cycloid disc profile. The drawing represents a very valuable and time efficient initiate for cycloid drive design.*

Keywords: *cycloid gear, shortened equidistant epitrochoid, automated generating*

1. INTRODUCTION

Cycloid drives are part of the planetary drive group. Cycloid drives (Figure 1) are widely used in the industry due to their excellent characteristics, specifically, wide range of gear ratios, compact size, smooth transmission, high efficiency, high overload capacity, low noise, long and reliable service life, compact design and suitability for frequent start-stop and reversing duty. Thanks to the afore-mentioned characteristics, cycloid drives have many applications, such as in: conveyor systems, presses, extruders, cranes, spinning machines, processing and automotive plants, mixers, food processing machinery, etc.

The most important element of the cycloidal speed reducer is cycloid disc whose teeth profile is an equidistant of the shortened epitrochoid. In the theoretical case, when machining tolerances are not considered, half of cycloid disc teeth participate at the load transmission process. The basic information about cycloidal gearing is presented by Kudrijavcev [1] and by Lehmann [2]. Litvin and Feng [3] developed parametric equations for the equidistant of trochoid [4].

Figure 1. Model of cycloid drive

Generation and geometry of planar cycloidal gearing has been covered by [5]. Other problems and concepts concerning the geometry, tolerances and analysis of cycloid drives have also been covered by