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Cycloidal Speed Reducer

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Abstract: The speed reducer is mechanism where the speed of input to output shaft is reduced by certain ratio. After comparing with general gearboxes and speed reducers, a broader range of reduction ratios are given by cycloid drives , possess higher load-carrying capacity, are dimensionally little and provide non committal, quiver free performance along with high efficiency. These characteristics make them well suited for infallibility industrial applications, especially in robotics, machine tools and linear axis positioning in assembly & packaging machinery.

I. INTRODUCTION

When the torque required by the driven machine is more than the torque developed by the prime mover, the gearbox is used to increase the torque. Gears or speed reducers are used widely in various application for speed and torque conversion. This speed reducer having in volute profile and point contact between roller and disc.so wear and tear is more and noise is also more. so we designed cycloidal speed reducer to overcome that problem. Cycloidal speed reducer is having cycloidal profile due to the rotation of this speed reducer noise is also reduced. This reducer is having collinear shaft and all the power, speed or torque is changes collinearly from input shaft to the output shaft. Cycloidal speed reducer is having line contact between the rollers and the rotating disc and due to that the wear and tear is also less with the noise. All problems are overcome due to use of this cyloidal speed reducer. In this speed reduction is happen in collinear way. All other are not having collinear shaft and due to that multi-staging of gears are required for all other speed reducer but we used collinear shaft and due to that muli-staging is not required in this cycloidal speed reducer. in one stage we get 11:1and 12:1gear speed ratio. know how to determine the reduction ratio of a cycloidal reducer.
Ratio=(P-L)/L
L = Number of lobes on a cycloidal disc

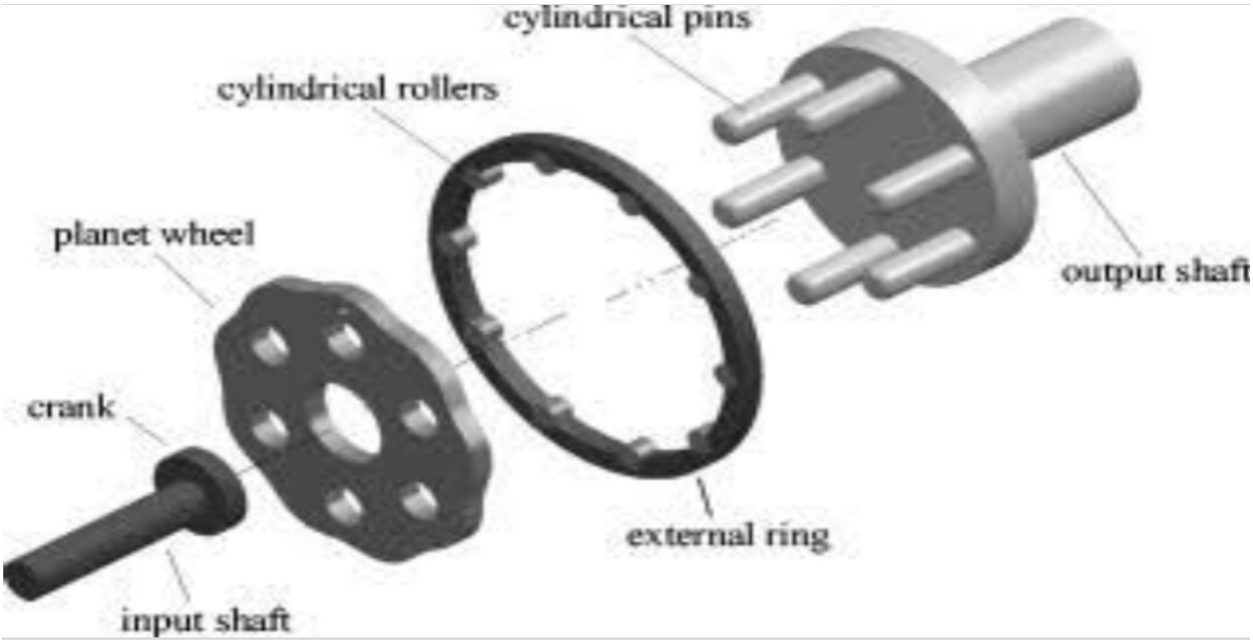


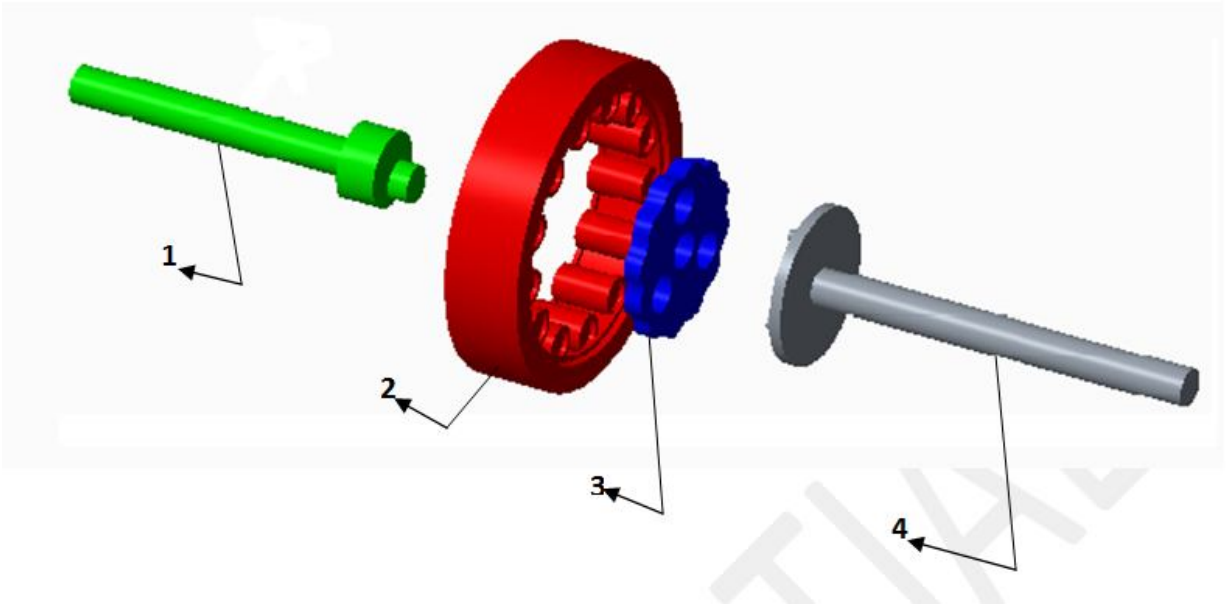
Fig:-Cycloidal speed reducer parts

A. Creo Model Of Cycloidal Speed Reducer Drawing

1) Input Eccentric shaf
2) Roller bearing (NU316)

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3) Cycloidal disc/lobe
4) Output pin shaft



II. LITERATURE REVIEW

A. Design of double stage cycloidal drive using roulette curve generation technique

Published year:-2017

Author:-Dr. K.B. Waghulde et al

Description:-Balancing of the drive is important as meshing of the gear drive. Double stage cycloidal speed reducer design and modeling is done and they are not bound to specific boundaries and optimization is possible in ratio holes of cycloidal disk.

B. Design and Manufacturing of Cycloidal Speed Reducer

Published Year:-2016

Author:-Aditya k. Vasaikar et al

Description:-In this paper they just research on design and manufacturing of cyclodal speed reducer. Purpose of this paper is study of simple, exact and theoretical and experimental investigation on innovative cyclodal speed reducer.

C. A New Design of Two Stages Cycloidal Speed Reducer

Published Year:-2011

Author:-BlazaStojanovic et al

Description:-In that represent a new concept of the two stage cycloidal speed reducer where only one cycloidal disc is used for each stage. Analysis and definition of two stage cycloidal speed reducer is theoretically obtained. Two stages are used but they have common input shaft. And for each stage only one cycloidal disc is used

D. Stress and Strain State of Single-Stage Cycloidal Speed Reducer

Published Year:-2011

Author:-MirkoBlagojevic et al

Description:-Analysis of stress and strain is done for single cycloidal speed reducer by using software CATIA, 3D finite elements for study of favorable condition.

E. On the lobe profile design in a cycloid reducer using

instant velocity center

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Published Year:-2006
Author:-Joong-Ho Shin, Soon-Man Kwon
Description:-lobe profile is main part of cycloidal reducer. In previous paper study of single cycloidal drives lobe profile is study. In this paper four types of the cycloid drives by the lobe profile of the cycloid plate gear and the roller gears motion, the stationary ring gear type epicycloid reducer, the rotating ring gear type epicycloid reducer, the stationary ring gear type hypocycloid reducer and the rotating ring gear type hypocycloid reducer.

III. FUTURE SCOPE

In cycloidal speed reducer collinear shaft is used for power transmission, where the collinear power is required used of cycloidal drive is done. Replace the bevel and worm and worm type gear box by cycloidal speed reducer, because the speed reduction is more for same size.

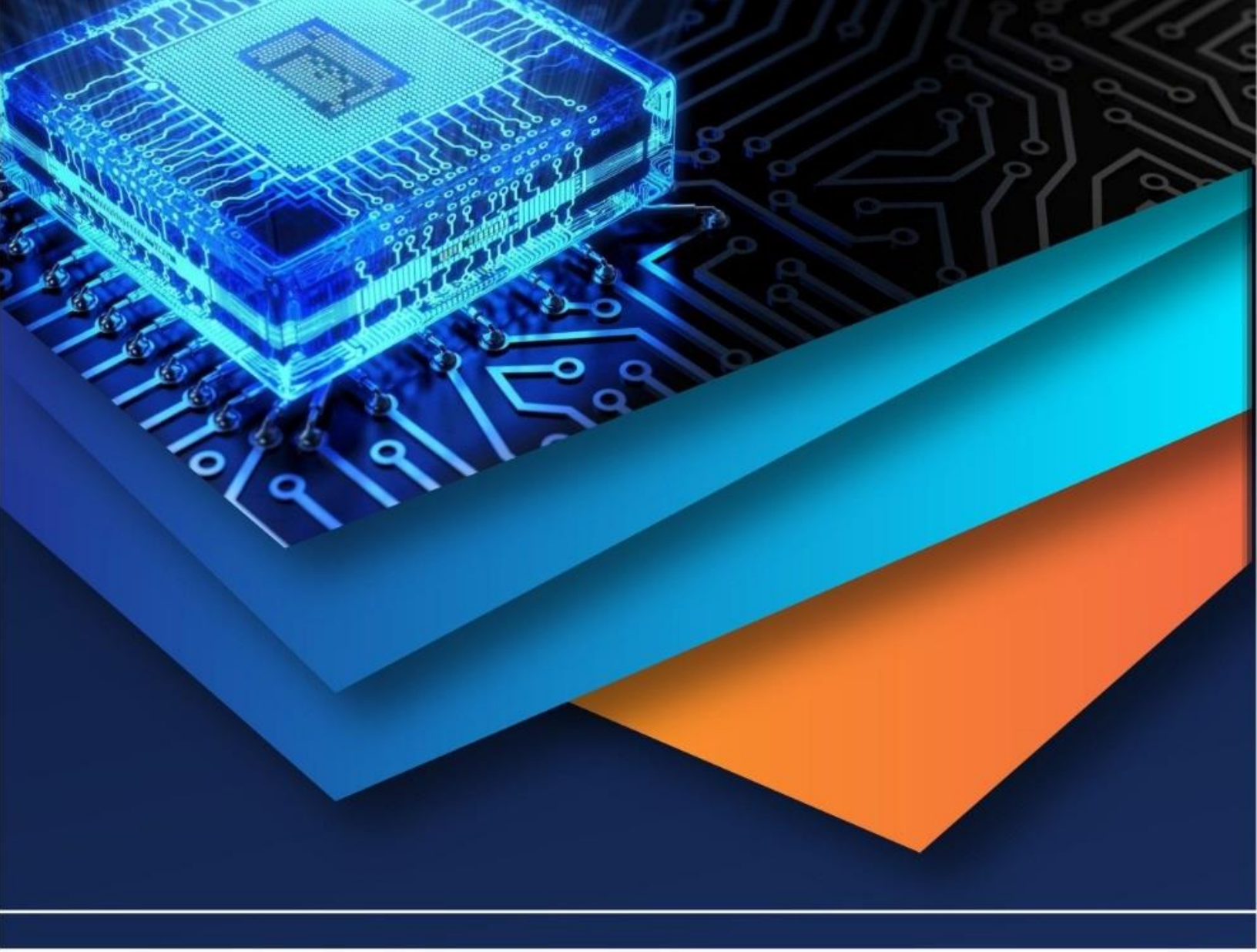
IV. CONCLUSION

To increase the torque gearbox reduced the speed between the driving and driven shaft. Cycloidal speed reducer is also known as cycloidal drive. Cycloidal speed reducer gearbox is better than other .cycloidal speed reducer gives high gear ratio in compact size. Gear box has purpose to reduce the speed or to increase the torque, therefore this codition is stisfy. Cycloidal drive used the collinear shaft. Due to cycloidal lobe the speed reducer should be less noise. The normal gear box is worm shaft and worm wheel type used for high speed reduction and torque increment. But it is not having collinear shaft and is big in size also cannot be fitted on motor mounting. Further high speed reduction is not possible in it.In involute gearbox interference will be generated due to that non conjugate action occurred so tooth of gearbox gets damage so overcome all these problems we can select the cycloidal gearbox for the speed reduction.

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