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Implementation of Uni-directional Shaft for Energy Conservation

Krishnpal singh Tomar
Prestige Institute of Engineering and Science Indore
Email id: Krishnpal99@gmail.com

ABSTRACT
In several decades Technocrats used unidirectional shaft in which many gear assemblies were used, consequently which is very bulky and expensive to use in commercialization This paper is based on advanced as well as economic implementation in unidirectional shaft by using ratchet wheel and chain mechanism . This mechanical device is applicable to a mechanism, used especially in energy generating devices and some hand tools, consisting of a metal wheel operating with a catch that permits motion in only one direction and carrying spring loaded pawls on flanges to engage with accompanied either of the main parts of a ratchet device i.e. the toothed wheel or bar, or the pawl. One shaft is coupled to other shaft by aforesaid gearings, so that the rotary movement performed either on clock wise or counterclockwise direction on input shaft will result unidirectional motion applicable in power generation and power transmission. When the wobbling movement of a floating body is connected to a rack of gears, this rack of gears will move up and down. Resulting reciprocal movement could be taken up by a pinion to generate oscillatory movement on a shaft. Such oscillatory movement is turned to unidirectional motion using this invention. Harnessing the immense wave power in the world's oceans can be part of the solution to word's energy needs. On the other hand there are numerous applications in industry requiring bidirectional motion to be converted to unidirectional motion.
KeywordsRatchet wheel & chain mechanism[2], unidirectional ,bidirectional, pawl[2], wobbling[3].

Introduction

The UNI DIRECTIONAL SHAFT relates to gear[7] arrangements, ratchet[1] wheel & chain mechanism for converting bidirectional motion of a input shaft into unidirectional motion of output shaft. Which is applicable as a intermediate mechanism in power generating devices and can also be used in power transmission directly as a device. This mechanism used to save energy loss during generation power and give lots of better efficiency by own mechanism means unidirectional work.

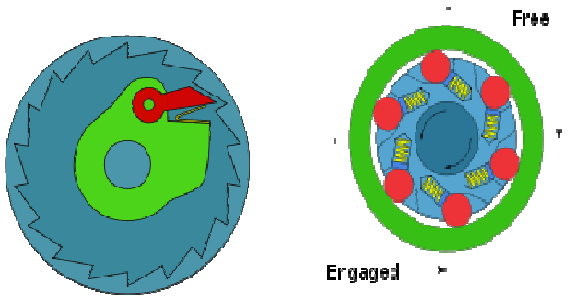
The current invention relates to gear[8] arrangements to convert bidirectional motion of a input shaft in to unidirectional motion of output shaft. But in my device there is only 2 gears are used and another ratchet wheel & chain mechanism is used to convert the bidirectional motion of a input shaft in to unidirectional motion of output shaft.

Description of current model

The present invention is a mechanical device which is applicable to convert bidirectional motion of an input shaft into unidirectional motion of an output shaft. In this device there are three shafts are used input shaft, intermediate shaft and output shaft. And two sets of gearing arrangement one after the other is used.

Working

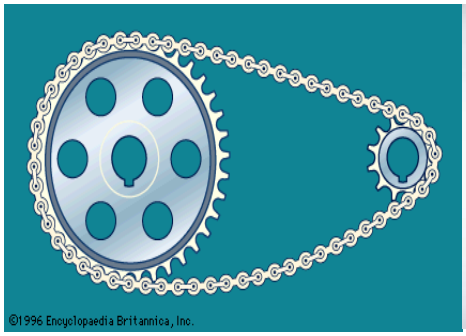
The implementation of device provided a mechanical assembly of one set of gearing arranged after the another in combination with ratchet and pawl mechanisms driven in opposite directions accompanied by two shafts namely input shaft and output shaft.



RATCHETING FREE WHEEL FREE WHEEL MECHANISM

The input shaft is fitted with two opposing ratchet wheels axially aligned while one ratchet

wheel attached by a gearwheel driven on bearings on the same shaft and the second ratchet wheel is attached to the ratchet wheel of output shaft with the help of a chain which is placed just parallel to the input shaft ratchet wheel._



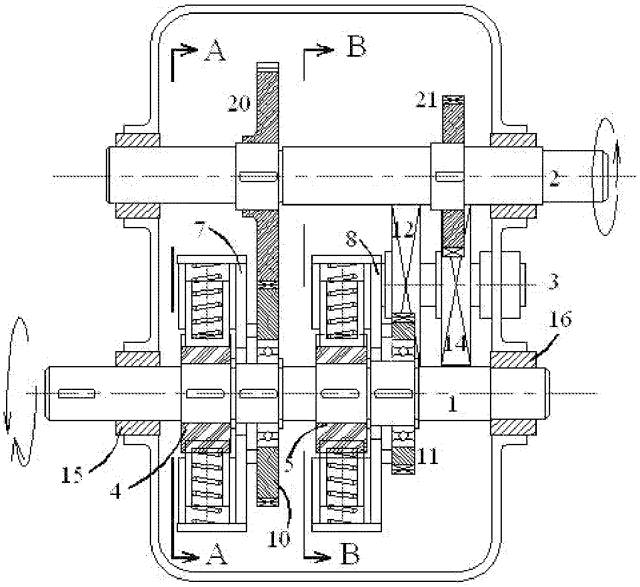
CHAIN DRIVE

SPUR GEAR

GEAR SHAFT

Some researcher arranged the shaft in the following described manner which is entirely different with the present work comparative description of both the manner is present hereby.

The output shaft is coupled to input shaft, by the aforesaid two consecutively arranged gearings, in which first gear fitted on input shaft meshes directly with, first gearwheel fitted on output shaft which turns in clockwise direction only, while second gear fitted to input shaft couple the output shaft , by means of counter gear arrangement to reserve its direction by means of intermediate shaft .So that in operation rotary movement performed either on clockwise or counterclockwise direction on input shaft will result in unidirectional motion on output shaft.



The output shaft is fitted with one gear which is placed just parallel to the gear of input shaft and it is adjusted in such a manner that the teeth of the gear is completely meshes with the teeth of the gear of input shaft.

Present research work is similar to the above described work including the counted difference as it is based on a mechanical device which is applicable to convert bidirectional motion of an input shaft into unidirectional motion of an output shaft. But in my device there are only two shafts are used one is input shaft and another is output shaft. And two sets of gearing arrangement one after the other is used. In addition to this in my device there is a ratchet wheel & chain mechanism is also used.

Survey of literature

The current invention is a mechanical assembly applicable to convert bidirectional motion of an input shaft into unidirectional motion of an output shaft comprising input shaft, intermediate shaft and output shaft, wherein two sets of gearing arranged one after the other, in combination with ratchet and pawl mechanisms driven in opposite directions, with two opposing ratchet wheels fitted to input shaft,[6] each accompanied by a gearwheel driven on bearings on the same shaft with protruded flanges[5] integral to aforesaid gear wheel, carrying spring loaded pawls on flanges to engage with accompanied ratchet wheel.

Conclusion

The uni directional shaft is working like a energy saver. It converts two
Directional motion as clockwise and anticlockwise direction in the single directional motion . It helps in Using more and more energy to produce power, which can utilized to fulfill world's energy necessities in economic manner. This mechanism is used in turbines, so that more power can be produced. This device simply used with turbine and cost of installation is very low. this research is fruitful, efficient and effective as well.

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References:

1) WWW.THEDICTIONERY.COM
2) WWW.WIKIPEDIA.COM
3) WWW.IMBD.COM
4) WWW.IGUS.COM
5) WWW.IGBM.COM
6) WWW.LIKECOOL.COM
7) WWW.TOPGEAR.COM
8) WWW.GEARSOFTWARE.COM