

Gearless Power Transmission Through Elbow-Rod Mechanism and to Compare it with Bevel Gear Mechanism for Wood Cutter Application

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Abstract: Generally readiness of speed increasing every field minimum time and more quality product are made the conventional system like a gear is major problem while calculating the effencin=g of machine the gear are required for transmission of power to input to output shaft they major power loss due to friction So that the gear replaced by the 3 or more no elbow rod having (90⁰) bent this mechanism is called as “Gearless power transmission mechanism” is replaced of bevel gear is low cost and low Torque application are used it can be transiting angle (0⁰to90⁰).it is work on kinematic chain principal and in genius link mechanism when power is transmit input shaft to output shaft ,Gearless transmission mechanism transmits power from input to output shafts by means of sliding links that form revolute pair with the hub elbow rod are slide inside the housing and power transmission take place in our project power is transmit without any gear can be manufacturing .

Keywords: Elbow Rod, Hub, Power transmission, Shaft.

I.INTRODUCTION

The project “EL-BOW POWER TRANSMISSION” was being compact and portable equipment, which is skillful and is, having something, practices in the transmitting power at right angle without any gears being manufactured. Most of the material is made available by our college. The parts can be easily made in our college-shop its price is also less. This project gives us knowledge, experience, skill and new ideas of the manufacturing. It is a working project and having guarantee of the success. This project is the equipment useful to improve the quality of the gear being manufactured and can be made in less time, hence we have selected this project el-bow mechanism is an ingenious link mechanism of slider and kinematic chain principle. This is also called as “gearless transmission mechanism” this mechanism is very useful for transmitting motion at right angles. However in certain industrial application “gearless transmission at right angle” can also work at obtuse or accurate angle plane can be compared to worm and worm gear or bevel and pinion gear which are invariably used in the industry for numerous application. The main feature for mechanism comparatively high efficiency between the input and the output power shafts with regards to the gear efficiencies.

II.SYSTEM STUDY

We have fabricated 3 pin gearless power transmission. gearless power transmission mechanism is portable and compact equipment. mechanism consist of 2 hubs 3elbow rod 2 shafts motor (A,c) motor ,belt drive .the motor & belt drive is coupled to the end of any one shaft. as the power is transmission ton the shaft feom the motor through belt drive the shaft rotates along with hub the elbow rods placed in the holes of the hubs slides in and out of the both the hubs due to the power from one shaft is transmitted to the another. in our project is comparing by the bevel gear mechanism ,comparing both mechanism. as shown an Fig.1.

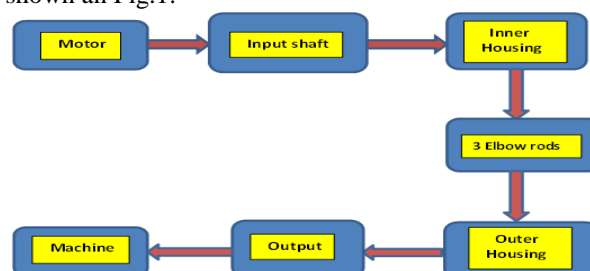
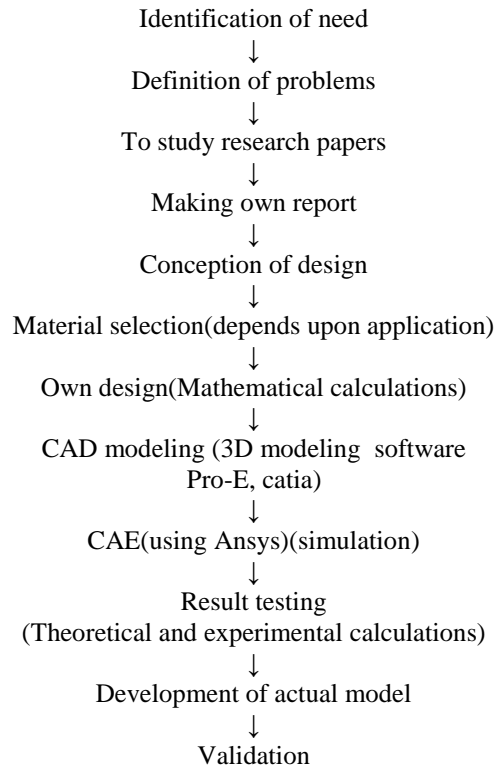


Fig.1: Gearless power transmission for skew shafts

III.METHODOLOGY



IV. COMPARISON OF GEARED DRIVE WITH GEARLESS DRIVE

Table.II.Comparison of geared drive with gearless drive

GEARSYSTEM	GEARLESS SYSTEM
Manufacturing method costly	Manufacturing method less costly
Manufacture on special purposed machine	No need of special purpose machine
complex calculations	simple calculations
No interchangeability	freedom of interchangeability
cause of failure-	cause of failure-
Pitting , corrosion , erosion and fatigue have saver effect	Pitting , corrosion , erosions and fatigue have effect less severely
Replacement of entire gear sets needs to be done	Replacement of defected pins only
lubrication and cooling-	lubrication and cooling-
complex system	Simple
cooling is big issue	Easy to cool
Torque transmitting capacity	Torque transmitting capacity
Used in high torque applications	low torque applications

V.WORKING & CONSTRUCTION

A.Working

The Gearless transmission or El-bow mechanism is a device for transmitting motion at any fixed angle between the driving and driven shaft. The synthesis of this mechanism would reveal that it comprises of a number of pins would be in between 3 to 8, the more the pins the smoother the operation. These pins slide inside hollow cylinders thus formatting a sliding pair. Our mechanism has 3 such sliding pairs. These cylinders are placed in a Hollow pipe and are fastened at 120 degree to each other. This whole assembly is mounted on brackets wooden table. Power is supplied by an electric motor. The working of the mechanism is understood by the diagram. An unused form of transmission of power on shaft located at an angle.

B. Construction

It consists of links or rods that are bent exactly at 90 degree (right angle). The number of links required would be 3 to 8. The more the links, the smoother will be the operation. Links are made up of bright bars as the bright bar material has good surface finish. These links slide inside the through and through drilled Cylinders. Thus forming a sliding pair. These cylinders are coupled to the input and output shaft with help of key. Power is supplied by electric motor.



Fig. 3:, Experimental setup

VI. ADVANTAGES

- 1) Mechanism is very simply due to elimination of valve mechanisms.
- 2) Mechanism is small.
- 3) No crank & crank shaft are necessary.
- 4) Lesser vibration because the reciprocating force are perfectly balanced.
- 5) Smooth & high speed operation can be easily obtained by cause of elimination of the valve setting linkage.
- 6) Complete freedom of Interchangeability.
- 7) Power could be transferred to any desired angle.
- 8) Low cost manufacturing.
- 9) Simple cooling system.
- 10) Portability of parts.

VII. APPLICATION

- 1] Tower clock
- 2] wood cutting machine
- 3] Multi spindle drilling
- 4] Use in Vehicle (GO- Carts)
- 5] Robotics and artificial intelligence
- 6] In compression and pumping devices
- 7] For movement of periscopes in submarines.

VII. CONCLUSION

Some successful mechanical devices function smoothly however poor fly they are made while others do this only by virtue of an accurate construction & fitting of their moving parts. This project which looks very simple & easy to construct was actually very difficult to conceive & imagine without seeing an actual one in practice. It is an event a fact in the creative mental process not the forces, which predominate among the schemes of the active tinkers. Motion demands to be studied first & we have done that very thing. We find that while acceptable analysis for existing mechanism can often be made quite easily we cannot without insight & imagination make effective synthesis of new mechanism hence we are moulded to present this our project gear less transmission at 90° (El-bow mechanism) which we have managed to successfully device after long & hard input in conceiving its working principle.

**ACKNOWLEDGEMENT**

We are very grateful to our Professor **Ms. shingavi A.A** to helpfully us & supported a lot and we also want to thank our head of department **Mr.P.G Tathe** without help of this paper would not have been successively publish possible.

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