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International Journal OF Engineering Sciences & Management Research

DESIGN DEVELOPMENT AND MULTIPURPOSE OF BICYCLE

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ABSTRACT
The energy is recovery system is a technology used in bicycle for some concept i.e. the sprocket wheel is mounted in between frames of the bicycle. The sprocket wheel is increases the RPM of cycle by rotating and this save energy can be given back to the system which will reduce the pedalling power required to drive the bicycle. Storage energy uses for flour mill with suitable mechanism along with sprocket and chains. Further this project concludes about speed of blade of flour mill and pedalling power in sprocket wheel bicycle.
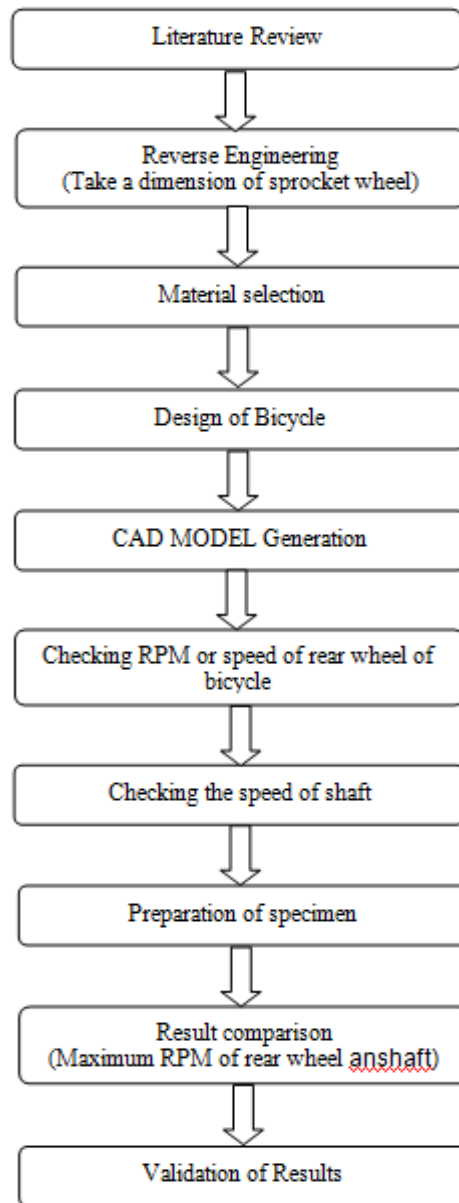
INTRODUCTION
Now a day's energy is produces in various ways in the world or also energy is recover by various system. This can be used for different multipurpose. In bicycle the energy is recovery is very necessary . Because it can't be recover or use for multipurpose. To control this pollution we are make a project about it by using bicycle .In our project we use sprocket wheel and chain mechanism for increasing RPM of rear wheel by reducing efficiency of pedal power means save the pedal power. Also the saving energy is in the form of mechanical energy. We are converted this mechanical energy into electrical energy by using bevel gear.Wheat flours are the integral of daily diet of Indian population in the world. The kernels are processed in chakki (flour mill) to produce wheat flour by wheat grain put in the chakki which is then used to make breads, biscuits, pastas etc. In India chapatti and other variants of wheat forms the staple food that will be make from wheat flour in majority of population. In manual process the flour is produced by hand cranking the conventional stone wheels in before century. But this method is characterized by slow operation, low production rate more time. Further this hand cranking process is physically demanding through energy and postural requirements also more time required. It may also leads to clinical and anatomical disorders which may affect operator's health also effect the environment.   In order to make it possible to operate the system effectively and efficiently and safely.It is necessary to develop this system by giving due respect to human limitation using different idea and technology. Hence ergonomic system of bicycle pedal operated flour mill is developed. The ergonomic consideration mainly includes the selection of components and materials of system which suits the human capability and develops the posture to operate system to reduce the fatigue,time and chances of musceletole disorders also to increase speed of bicycle and reduce time.

Problem Definition
Now a days using electricity we convert wheat into flour with external supply. When electricity is goes or cut the mill cantwork.The electricity problem may occur during working it will be stop working of mill. For this problem we make solution about electricity through project by operated it by using pedal of bicycle.

OBJECTIVES
- To design and develop machine using human sources to drive mechanism.
- To Reduce cost.
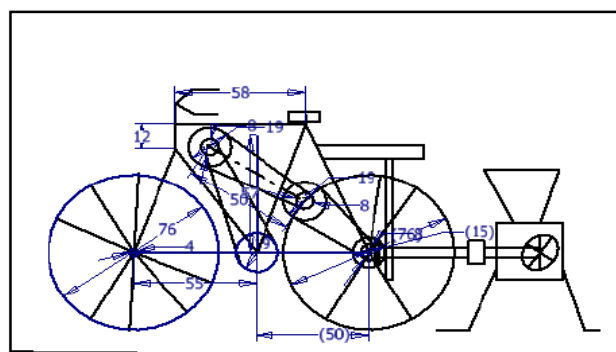- For Exercise Purpose.
- To reduce time.
- Fast Work

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METHODOLOGY

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┌─────────────────────────────┐
│      Literature Review      │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│     Reverse Engineering     │
│ (Take a dimension of sprocket wheel) │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│      Material selection     │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│      Design of Bicycle      │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│      CAD MODEL Generation   │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│ Checking RPM or speed of rear wheel of │
│            bicycle          │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│   Checking the speed of shaft │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│   Preparation of specimen   │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│      Result comparison      │
│ (Maximum RPM of rear wheel anshaft) │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│     Validation of Results   │
└─────────────────────────────┘
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Modeling

Fig.2 2-D Model of bicycle with flour mill

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Fig.2 Setup of Project

MATHEMATICAL MODELLING

Gear ratio= driven gear / drive gear$_{=1/6}$
Design of gear:-

Slip torque=laden wt.on front axle*index radius
              =2500*9081*.65=15941.25

$$A_0 = \sqrt{\left(\frac{Dp}{2}\right)^2 + \left(\frac{Dg}{2}\right)^2} = \sqrt{\left[\left(\frac{11}{2}\right)^2 + \left(\frac{32}{2}\right)^2\right]} = 16.9189s$$

Dm =9.350
Vm=$\pi DmN \div 60$=0.2005,N=409.53rpm
Cv=(3.5+$\sqrt{Vm}$) $\div$ 3.5=1.3257
Ϭb actual=651.517 N/mm^2
Ϭb all=(1/3)*Sut=(1/3)*2069=698.667N/mm^2
Ϭb actual< Ϭb all
   Design is safe.

RESULTS AND DISCUSSION
Increasing the speed or RPM of the rear wheel of the bicycle by operating pedaling of bicycle shaft get 6times more speed than normal speed of bicycle in one revolution of pedal. That increasing the speed of the shaft that will be connected to rear wheel with joint. Due to this blades of the flour wheel fastly rotated that will be connected to the shaft with the help of crown gear. Using or operating that bicycle we convert the wheat or other grains are into flour.

CONCLUSION
The main objectives behind development of pedal operated flour mill is make we it will be easy to operate system which can easily fabricated by radially available material and thus we proposed a simplistic design that can deliver efficient , productive and reliable flour mill which can be used in rural area as well as urban areas. This equipment can be easily operated by semi-rather low skilled operator Further this equipment can be easily find its place where there is no power supply.

ACKNOWLEDGEMENT

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