# PEDAL OPERATED WHEAT GRINDER WITH CELL PHONE CHARGER

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## ABSTRACT

Bicycle is the main mode of transportation for many Indian villagers. Most of these villages are un-electrified. Power generated by pedalling can be converted from mechanical to electrical energy by using either dynamo or alternator. Small powered lighting devices can be charged using dynamo and can be used in the night by students for study purposes. This principle can be extended to power mobiles, iPods, laptops etc. Power can be also generated from the rotation of the wheels of alternator vehicles like bikes and cars, where there is a possibility of generating more power. The generated power can be either use in the same vehicle or can be stored in a battery for powering some other devices. Riding bicycle helps in maintaining a good physic and along with it power can be also generated. This paper presents methods in generating electricity by pedalling a bicycle. It also explains in detail the method using bottle dynamo to generate power. A detailed analysis of using pedal power is also presented.by Riding the bicycle we can also Rotate the Wheat Grinder And we can used it simultaneously According to the Requirement.

## INTRODUCTION

As Now days we are increasing in innovation & technology that is very good for our future & our upcoming generation. But giving our all power towards these we are forgetting about our physical health. So we know physical health also effect are mental health so we have to give our sometime for physical health. We have some sort of solution for this problem so made a pedal operated wheat grinder & cell phone charge.

Pedal operated is simple exercise which we can do in any place like in our home, garden and gym. Just we can give our 1 hour or 30 minute of every day which will going to help us in physical health.

By using this machine there are three different Benefits such as improving our physical health as well as our mental health, Producing fresh flour and simultaneously it also going to charge our cell phone.

## 1.LITERATURE REVIEW

A. Manpower-driven small-sized grinder, Yang Jianhua

[1] The invention discloses a manpower-driven smallsized grinder comprising a frame, a spindle horizontally fixed on the frame, a first rotating sleeve mounted on the spindle through a bearing, a grinding disc, a first sprocket And a manpower drive mechanism. The grinding disc and the first sprocket are fixed on the first rotating sleeve.

B. Method and apparatus for converting human power to electrical power, Linda Vasilovich, Richard Hilger

[2] This application is a continuation-in-part of U.S. patent application Ser. No. 11/060,992, attorney docket number PVAS0002US/MRK, entitled "method and apparatus for converting human power to electrical power," filed Feb. 18, 2005, now U.S. Pat. No. 7,253,534 the entire content and disclosure of which is incorporated herein in full by reference as if stated in full herein, which claimed priority to U.S. Provisional Patent Application Ser. No. 60/545,383, attorney docket number PVAS0001/MRK, entitled "method and apparatus for converting human power to electrical power",

filed Feb. 18, 2004, the entire

disclosure of which is incorporated herein in full by reference as if stated in full herein.

C. Human powered device with removable flywheel power unit, Cory Dension

[3] A flywheel power unit that can be inserted into a variety of machines. The standardization of the power unit means that the more expensive gearing, clutch and flywheel components do not have to be duplicated in each human powered machine. Standard bicycle gearing components can be assembled with a modified clutch for a typical motorcycle to create an inexpensive human powered flywheel power unit. As the user pedals, power is stored in the flywheel.
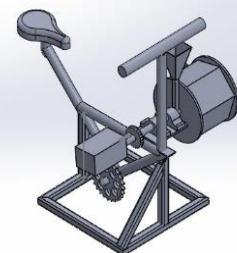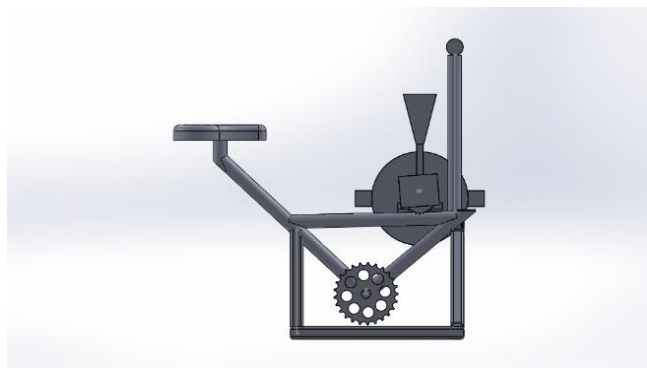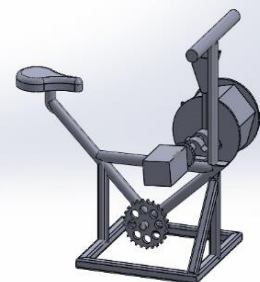
## 2.DESIGN



*Figure 1*
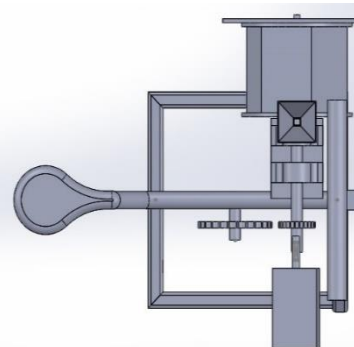


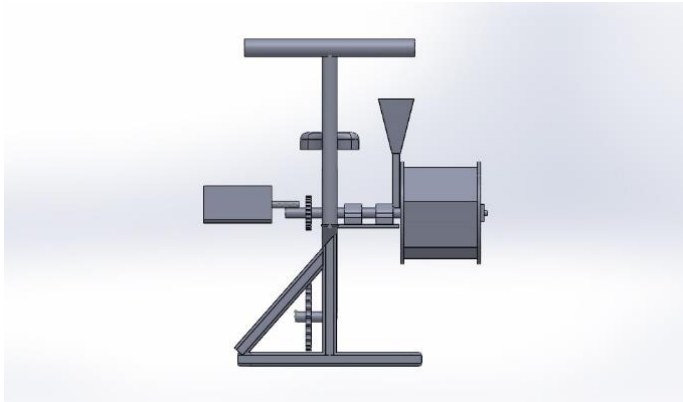*Figure 2*



*Figure 3*



*Figure 3*

*Figure 4*



## 3. GENERAL PROCEDURE IN MACHINE DESIGN

The general steps to be followed in designing the machine are as followed.

Preparation of a statement of the problem indicating the purpose of the machine.

i) Selection of groups of mechanism for the desire motion.

ii) Calculation of the force and energy on each machine member.

iii) Selection of material.

iv) Determining the size of component drawing and sending for manufacture.

v) Preparation of component drawing and sending for manufacture.

vi) Manufacturing and assembling the machine.

vii) Testing of the machine and for functioning.

## 4. DESIGN OF SHAFT

• A shaft is a rotating member usually of circular cross section (solid or hollow), which is used to transmit power and rotational motion. Axles are non-rotating member.

• Elements such as gears, pulleys (sheaves), flywheels, clutches, and sprockets are mounted on the shaft and are used to transmit power from the driving device (motor or engine) through a machine.

• The rotational force (torque) is transmitted to these elements on the shaft by press fit, keys, dowel, pins and splines.

• The shaft rotates on rolling contact or bush bearings.

• Various types of retaining rings, thrust bearings, grooves and steps in the shaft are used to take up axial loads and locate the rotating elements.

Design of Shaft

Terms used:-

T= Twisting moment (or torque) acting on shaft.

J= polar moment of inertia (polar MI) of shaft about axis of rotation.

$\tau$= Torsional shear stress N/mm^2.

L= Length of shaft in "mm".

P= power transmitted in KW.

(1). Shaft subjected to twisting moment only,

$$T/J = \tau/r$$

For solid shaft,

$$T = \pi/32 \times d^4$$

$$T/\pi/32 \times d^4 = \tau/d/2$$

$$T = \pi/16 \times d^3 \times \tau \qquad \qquad \ldots \qquad (1)$$

Also,

Power (P) = $2\pi \times N \times T/60$

$1.49 \times 10^3 = 2\pi \times 300 \times T/60$

T = $47.71 \times 10^3$ N.mm

Taking shear stress value from design data book,

$\tau$ = 32 N/mm^2   OR   MPa

Using strength equation from equation (1),

T = $\pi/16 \times d^3 \times \tau$

$23.71 \times 10^3 = \pi/16 \times d^3 \times 42$

d = 20mm

$\approx$ 20mm (standard value)

## 5.CONCLUSION

The proper guidance of project head and the sincere efforts of our group have lead to the successfully accomplishment of our concerned projects.
"PEDAL OPERATED WHEAT GRINDER WITH CELL PHONE CHARGER" was interesting to work on and was also gained in this project work...
A pedal operated wheat grinder was developed for the households in rural areas, where there  is shortage of electricity.The developed unit can also be used by the small poultry farms in the preperation of poultry feeds.The developed wheat grinder would be boon for the farmers of remote villages and in the villages where there is scarcity of electricity or no electricity at all.The machine could be operated with a very minimum effort and even the women in the households can run the machine easily whenever required.

## REFERENCES

[1] CN104369099 A, Manpower-driven small-sized grinder, Yang Jianhua

[2] US7504737 B2, Method and apparatus for converting human power to electrical power, Linda         Vasilovich, Richard Hilger

[3] US6983948 B2, Human powered device with removable flywheel power unit, Cory Dension

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[5]http://www.lowtechmagazine.com/2011/05/history-of    -pedal-powered-machines.html

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