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BICYCLE GENRATOR

[1]Rutvik surwase , [2]Vivek Tihile, [3]Kuldeep Telange, [4]Abhiskh Kale

[1]UG Scholar, Department of Electrical Engineering. JSPM's Polytechnic, Wagholi, Pune
[2]UG Scholar, Department of Electrical Engineering. JSPM's Polytechnic, Wagholi, Pune
[3]UG Scholar, Department of Electrical Engineering. JSPM's Polytechnic, Wagholi, Pune
[4]UG Scholar, Department of Electrical Engineering. JSPM's Polytechnic, Wagholi, Pune
rutviksurwase@gmail.com

Abstract:- The present life of the people is running with unavoidable frequent power cuts of about three hours per day and which is hardly controlled by wealthiest using electrical power generators and not by middle order people. In order to overcome this problem by the middle class and below average people, in this project, bicycle pedaling concept is employed to develop an electrical power which can be used for cooking food especially at the time of power cut. The bicycle pedaling converts the mechanical energy into electrical energy through manually. In our project, the bicycle generators is placed in Gym, and its function and feasibility analyzed.
Index Terms:- generator, Faraday law, Motors

I. INTRODUCTION

The word energy means required to do work. The world fills with many energies and energy resources. Electricity is the main energy which make the world run describes
The design and analysis of bicycle generator and its feasibility. This resulting machine known as dual purpose bicycle can be used to power numeric small scale mechanical devices electrical generator and availability of small machine tools. The dual purpose bicycle can be converted from its transportation mode to its pedal power mode or vice versa a matter of minute. To study about the bicycle generator and its feasibility this study was carried out.

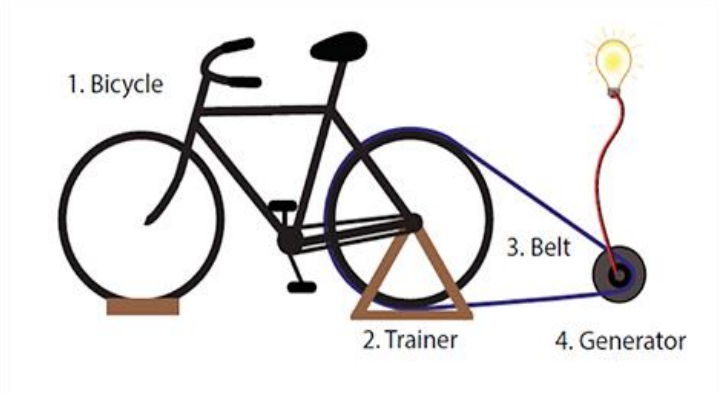

Fig.1-Bicycle

II. CONSTRUCTION

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The entire design of bicycle power generation and its feasibility includes; Battery, Generator, Bicycle, Sprocket, invertor board, Stand for Generator, Belt (type of belt) and Chain. The back wheel of the bicycle coupled with the generator through belt. The belt is placed over the rim of the wheel. on the other side the belt placed over the generator through the battery and inverter board are connected in series. The two terminals from the generator connected with battery. The battery is used to store the electricity. as the current produced in the D.C form it can be directly stored in the battery. The inverter board is coupled with the battery to convert the D.C current to A.C current. Finally the inverter board is connected with the power terminal for power supply.

2.1 WORKING

As per the design the bicycle generator is constructed. In this manual load is applied on the bicycle pedal due to the manual force the largest sprocket starts to rotated. The largest sprocket is connected with the small sprocket in the back end by simplex chain. There by the small sprocket also starts to rotate. The small sprocket is placed in the center shaft of the back wheel. So that the rotating motion of the center shaft transmitted to the back wheel there by the back wheel also rotate. The back wheel is coupled with the D.C generator through flat belt. Now the motion is transmitted to the generator. The generator convert this mechanical motion into electrical energy .The current produced is in the form of D.C so it can be directly stored in the battery. The inverter board is used to convert the D.C current into A.C current and then it sent to the supply port

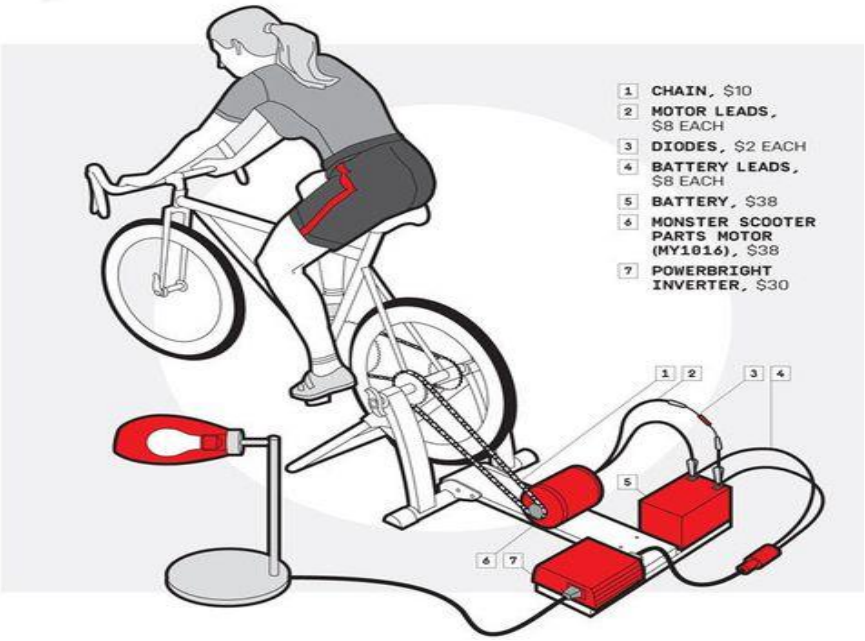

Fig.2:-working diagram

III. MAIN COMPONENT

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A.Bicycle

A bicycle is a human-powered, pedal-driven, single-track vehicle having two wheels attached a frame, one behind the other. A sprocket or sprocket-wheel is a profiled wheel with teeth, cogs, or even sprockets that mesh with a chain, track or other perforated or indented material.

B. Generator and inverter board

The generator is used to convert the mechanical energy into electrical energy, which is shown in the fig. 2. Its specifications are Voltage; 3-12 V, Type; D.C and variable speed generator. The generator is connected with the battery and the inverter board. The specifications of the battery used for this work is; Nominal voltage; 12.0 V, Nominal capacity 20000 mA, 240 W/hr., Maximum discharging current; 300 A, and Weight ; 6350g. The inverter board has the following specifications; Power; 120 W, Load capacity; 500 V

3.1 History Of Project

I. In 2010, Jeff Hines, a local Flagstaff teacher who also served as the first WindSenator in Arizona, inspired us to pursue bicycle generators for use in K-12 classrooms. Shortly after, we learned of an NAU student, Matthew Petney, who had built a double-bike generator, which included a battery for energy storage and an inverter and outlet so normal 120-volt devices could be plugged into it. We purchased the system from Matt and shared it with several interested teachers and classes as an educational tool. Matt joined our team in fall 2011 to provide more technical guidance to our staff and our teacher partners in building bike generators, bike blenders, and more.

II. In fall 2011 and spring 2012, Marilla Lamb and Matthew Petney visited two of our partner schools (Flagstaff Junior Academy and Orme School) to build bike blenders and a bike generator with middle and high school students. The students were presented with the design challenge, as well as tools and materials, and worked with our staff to design and build the bikes. These bikes were used at several school events, and in the classroom the following year as a teaching tool.

III. In 2011, Marilla Lamb wrote a grant to NAU's Green Fund to fund a bicycle-powered charging station (The Eco-Pedaler), complete with energy meters so students can see the energy they produce and the energy they use, and with transparent coverings so all components are visible. The project was funded and a team of students designed and built the bike during 2012. The completed charging station can be seen in NAU's engineering building. Now, a team of senior electrical and mechanical engineering students are working on the second iteration of the charging station, which is also funded by NAU's Green Fund to improve its usability and versatility.

IV. Wind for Schools was awarded funding from the APS Leadership Grant program in 2012, and obtained nearly $5,000 to work with several teachers in Arizona at some of our partner schools to build bicycle generators either in their science classes or with their science clubs. Our team built these bike generators with students at Mount Elden Middle School, Coconino High School, STAR School, Williams High School, and Northland Preparatory Academy in Spring 2013. Several energy lessons accompany the bicycle generators that we built and worked with in K-12 classrooms.

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IV. CONCLUSION

The bicycle generator and feasibility is successfully analyzed. The working principle of the bicycle generator was successfully studied. Various cost estimation about profit and loss of the bicycle generator are studied and calculated by manually. It is mainly used for home purpose. It can be used at various prices where electrical power is required. Due to the portability of the property it can be taken to anywhere

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