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Bicycle Power Generation

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Abstract: Dynamo is a device that uses human energy to produce electricity for charging. Here a dynamo is used as the electricity generator. The input power is given to the paddle and final rotational speed is achieved in the dynamo rotor. Most components of the portable pedal power generator are based upon existing invention, both recent and historic. This innovation brings together the resourceful of pedal power generation with the transportation feasibility of a bicycle frame. During transportation, the unit can also capture energy used in braking and coasting.

In our country it can be used in the villages where the family members themselves can charge the battery by paddling for a short period of time each. This will not only provides electricity when needed but also provides a useful way of physical exercise for them. And due to the low initial cost and very low maintenance cost, wide scale application of 'Bicycle Powered Generator' can be a suitable source of renewable energy .

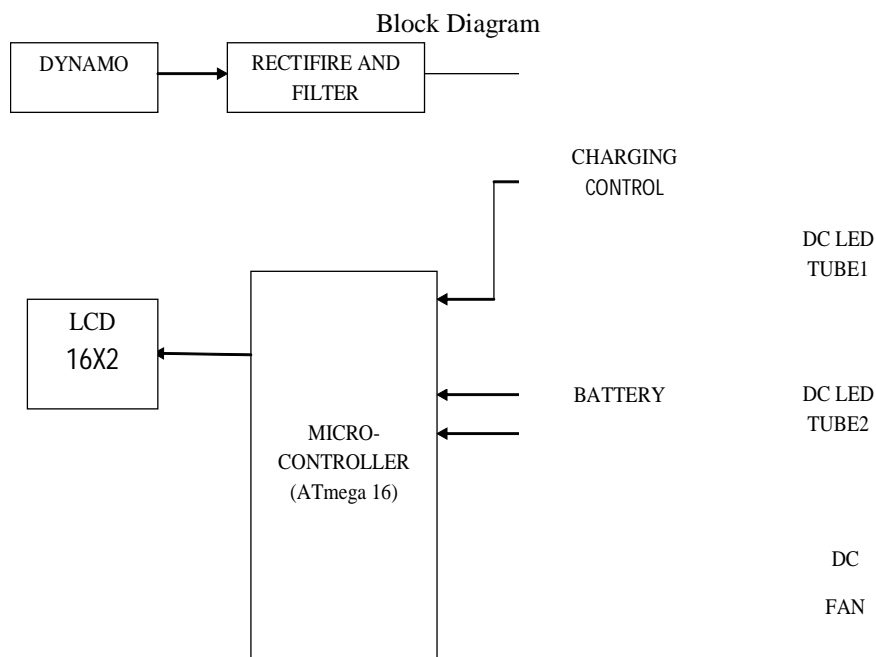
Keywords: Bicycle, Electrical energy, Dynamo.

I. INTRODUCTION

The intention of this project is to build a straight forward human powered generator from a used bicycle and to use it to power light bulbs, fans and other small appliances. This project will help one develop engineering skill while learning about a clean way of generating electricity.

Over the past decade, scientists and engineers around the world have been designing unprecedented energy-harvesting system, drawing power from a variety of sources. One of the most unlimited sources available is the kinetic energy produced from human exercise. Although recent designs of energy-harvesting exercise equipment have been introduced into the market, these systems is costly.

The objective of this project is to design a renewable energy source based around a exercise equipment. Also , who are interested to minimize environmental impact and those who want to preserve the environment will use this type of electrical energy generation. The energy expended in typical workout at the gym is usually wasted in the mechanics of equipment. This project is the mechanical energy of the machine converted into electrical energy. Produced energy is used in powering a piece of equipment such as tube, fan while exercising.



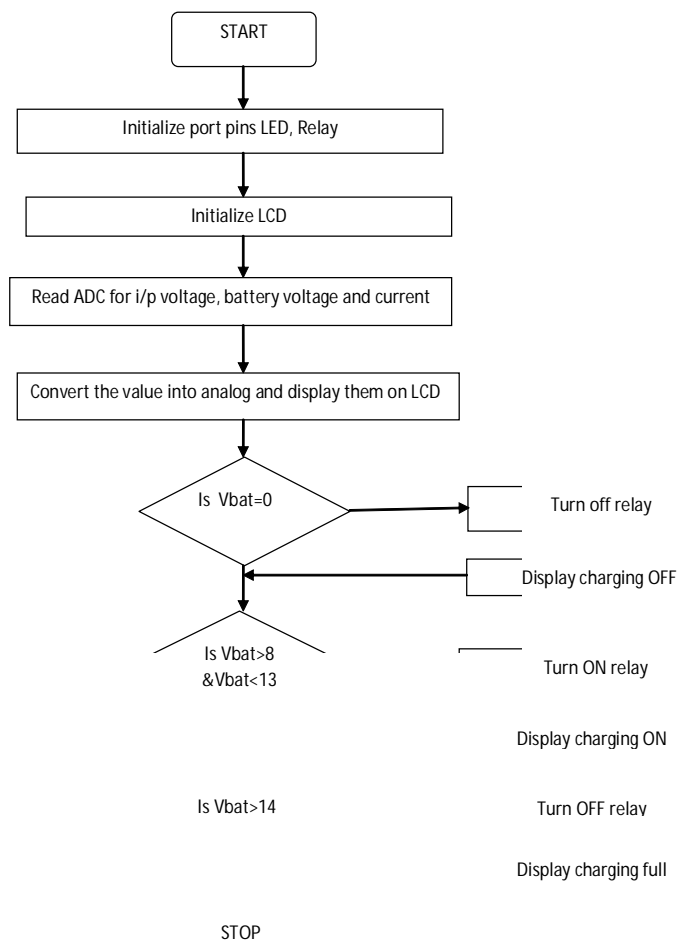
A. Working

The circuit consist of bicycle powered 12v dynamo and then when the bicycle is pedaled, the spinning motion rear tier is used to produced mechanical energy directly into a dynamo .while exercising the dynamo start rotate and produce AC supply. The output is connected to the charging control circuit .It consist of rectifier, filter & voltage regulator.

The AC supply is converted into DC through the diode rectifier. The output of rectifier is given to the voltage regulator. Voltage regulator regulates the voltage to 5 V.

The output from diode rectifier is connected to battery through charging control unit. The 12V is used to charge a battery.

Flowchart



B. Power Producton Calculation

The amount of power produced by the bicycle generator measured with the help Ammeter and voltmeter. From the current and voltage we can calculate the power. The amount of power by the bicycle dynamo in one hour is 6Watts-hr.

Dynamo output voltage=13.6V

Dynamo output current=0.43A

Power generated by dynamo=5.9Power consumed by LED tube=12x0.14=1.68W

Power consumed by DC fan=12x0.16=1.92W

Sr.no	Component	Quantity	Power consumption(W-hr)
1	LED Tube	2	3.36
2.	DC Fan	1	1.9



C. Future Scope

The analysis of bicycle power generation was done successfully. Even though there is something need to improve in our project, so we motivate the students of our college to build up the bicycle generator with more efficiency, like providing some mechanism for continuous pedaling. Instead of cycle wheel and the generator can be coupled with chain drive.

Otherwise the dynamo can be attach with the center shaft of the back wheel.

II. 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.

Due to the portability of the property it can be easily taken to anywhere.

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