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CARDIO RECYCLE POWER GENERATION SYSTEM

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ABSTRACT - Energy is essential for driving and enhancing the life cycle. The use of energy is proportional to humanity's progress. In today's scientific world, energy conservation is becoming a more significant area of research. Technologies related to renewable energy are essential for power generation both now and in the future. In addition to fuel cells, geothermal energy, and human power, non-conventional energy sources for power generation include biomass, solar, wind, tidal, and solar energy. It may be possible to use human labour as a renewable energy source. The development of a system based on renewable energy is the aim of this project. A gym bicycle powers the 24V motor, which serves as a generator. The bicycle's front wheel in a gym is connected to a motor in such a way that the cyclic rotation of the front wheel rotates the motor shaft. The produced direct current is converted into several different DC voltage levels that can be utilized. This is accomplished by converting DC voltage to AC voltage. It will benefit light bulbs, laptop and mobile phone charging, musical systems, and other products. The energy consumption in today's society will be reduced as a result.

Keywords: DC Motor, Prime Mover, Generator, Inverter, Gym Equipment.

I. INTRODUCTION

The scientific community is currently conducting a growing amount of noteworthy research in the area of power c onservation.The goal of this project is to construct a basic humanpowered generator that can be used to power and charge laptops, cell phones, and other small appliances using a gym bicycle.

Through this project, students will learn about a straightforward method of producing power and hone their engine ering skills. In the last ten years, engineers and scientists around the world have been designing unprecedented energy harvesting systems, drawing power from various sources. The kinetic energy created by human exercise machines is one of the most imaginative and limitless sources accessible. Although there are several new forms of energy collecting workout equipment on the market. These systems need to be modernized and designed for maximum power output, cost-efficiency, and marketability. This project contains an efficient yet controlled power storage and distribution system that may be used to adapt an existing workout machine. This project's goal is to create a sustainable energy source based on a piece of exercise equipment. Also, people who are interested in minimizing global warming and those who want to preserve the environment will use this type of electrical energy generation thereby reducing the emission of CO and CO2, to the atmosphere. The energy expended in a typical

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workout at the gym is usually going wasted in the mechanics of the equipment. With the ongoing revolution in the generation, electricity is generated at a small level by using gym bicycles. Most of these villages are electrified. As of May 31, 2015, India has a total of 19706 un-electrified villages. To power up these villages, the electricity generated by gym bicycles converted from mechanical energy to electrical energy using the motor as a generator will be helpful.

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II. METHODOLOGY

A gear system turns a flywheel to transform the kinetic energy produced by pedalling into rotational energy.a co nnection belt that connects the alternator and flywheel.This rotational energy is transformed into electrical energ y by AC generators.The battery is charged via a charging circuit, which also stores the generated power. So constant pedaling speed is not needed as we are storing the energy in the battery. According to load demand, DC voltage is inverted into AC by an inverting circuit and a step-up transformer is used to step it up. The gear system is finely tuned, making starting pedaling simple to achieve the desired RPM. At low rpm, the alternator produces less power with lower frequency, while at high rpm, the alternator produces more power with higher frequency. So the variation of speed has a certain impact on the power generation but it does not affect the overall efficiency as it is eventually converted into dc and stored in the battery for further usage.

III. BLOCK DIAGRAM

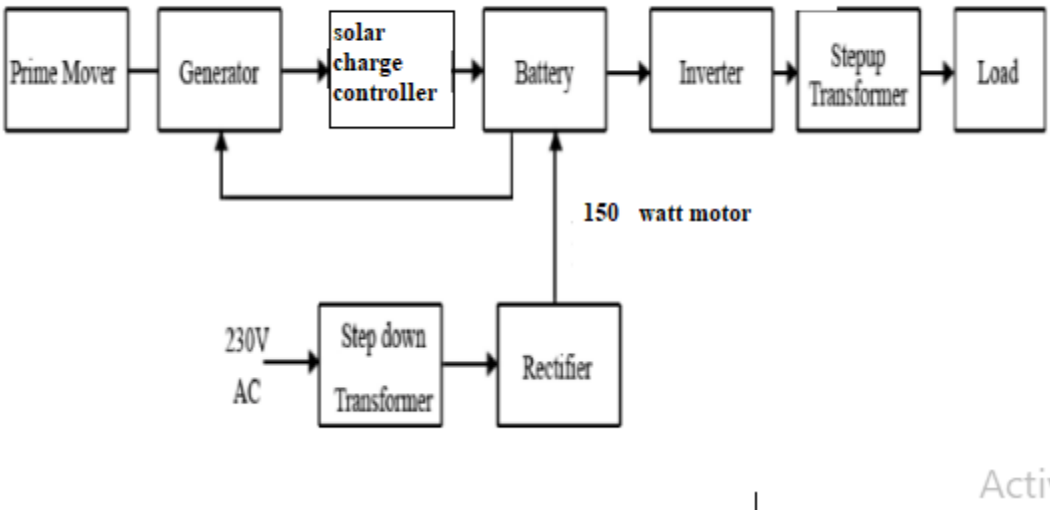

Fig.1- Block Diagram for Cardio Recycle Power Generation System

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B. Hardware Implementation

All generators, large and small, AC or DC, require a source as mechanical power to turn the rollers. This source of energy is named a major mover. Prime movers are divided into two cases for generators-high-speed and low speed Steam and gas turbines are high-speed prime movers, while internal-combustion engines, water, and electric motors are considered low-speed prime movers. Because the speed at which the rotor is used defines certain aspects of alternator construction and operation, the kind of initial cause plays a significant role in the design of alternators. Bicycle Drive Belt Stand Generator Prime Mover Setup for the altimeter.

A. Flywheel The flywheel's principal function is that of an energy accumulator. It lessens the speed fluctuations. It collects energy when demand is low and releases it when demand is high.

B. Battery The battery is the most important to provided power for the alternator rotor and the storage purpose of generated power. An electric battery is an advice consisting of one or more electrochemical cells which will convert stored chemical energy into electrical energy. A positive terminal, or cathode, and a negative terminal, or anode, are found in each cell. Electrolytes allow ions to move between the electrodes and terminals, which allows current to effuse of the battery to perform work Battery we used is 12V, 10 Ah rating.

IV. APPLICATION

This project contributes the role in reducing energy demand. The electricity generated from this project will power the light bulbs, tubes, laptop charging, mobile charging, many more. Some villages are facing the problem of electricity shortage this system will help in this need. This project also helps in mountain areas where electricity is difficult to reach

V. RESULT

The relation between speed and therefore the voltage The voltage beginning out of the altimeter depends on two variables: the quantity of current flowing through the foci coil (i.e. The strength of the magnetic field) and therefore the speed at which the alternator's field is rotating. The alternator features a regulator that tries to keep the voltage across the battery at a gentle 12.8V (the optimal voltage to recharge 12V batteries). It does this by regulating the amount of current flowing to the sector coil.

VI. CONCLUSIONS

Human power generation may be the answer to the world's current need to be more responsible with its electrica l power supply, which also helps to address the obesity and overweight issues.If additional investigation and refi nement of this concept show that it is successful in reducing energy use, localise energy distribution, and sustainability education, it might effectively address the three major concerns of electrical power, CO emission reduction, and obesity. We create and deploy cutting-edge workout equipment (stationary bicycles) to provide electricity for household appliances. Energy storage is considered vital in renewable energy systems to provide system stability. Combining pedal-driven generating with storage will dramatically improve the smart system's dependability. Because the complexity and accuracy of these modes vary, the model chosen must be appropriate for the purpose. It will be quite beneficial in everyday situations.

REFERENCES

[1] I. Takehiko, F. Tsuyoshi, K. Fumio, and T. Hiroshi, “Contactless current collector device for magnetic cushion train,” Japan, DE3237373A1, 1982-05-11.

[2] G. Andreas, H. Bernhard, “Electromagnetism energy transfer of synchronous linear motor,” DE4126454A1, 1993-02-11.

[3] I. Takehiko, “Contactless current collector for floating railway train,” JP58043104, 1983-03-12.

[4] F. Rolf, “Power supply system for a long-stator drive for a magnetic levitation train”, US5569987, 1996-10-29.

[5] A. Esser, “Contactless charging and communication system for electric vehicles,” IEEE Industry Applications Magazine, vol. 1, pp.1-4, December 1995.

[6] N. Maki, T. Tatsumi, T. Iwahana, and T. Fujimoto, “Methods and characteristics of train power source system utilizing the flux produced by track coils,” Electrical Engineering in Japan, vol. 101, pp.60-70,1981.

[7] K. Sugimori, H. Nishimura, “A one-converter contactless charger for electric vehicles,” PESC 98 Record. 29th Annual IEEE Power Electronics Specialists Conference, Fukuoka, Japan, vol. 7, pp.73-81, August 2002.

[8] CHEN Min, ZHOU Dengyan, XU Dehong, “Contactless power supply of maglev using harmonic injection method,” Proceedings of the CSEE, vol. 3, pp. 104-106, 2005.