

Gym Power Generation Mechanism

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ABSTRACT

The intention of this project is to design a renewable energy source based around a piece of exercise equipment. The energy expended in a typical workout at the gym is usually wasted in the mechanics of the equipment. This project harnessed the mechanical energy of the machine and converted it to electrical energy using a generator-based system. The exercise equipment, attached to the shaft of the generator. Thus produced electrical energy is used in powering a piece of equipment such as lamp or a computer while exercising.

This report will introduce the project and present all applicable information regarding the design, development, and the final product. This project will help one develop engineering skills while learning about a clean way of generating electricity. The modern challenge faced with the global energy situation is the growing energy demand and the strong dependence on unsustainable fossil fuels. Another concurrent issue is the adverse health and socio-economic implications of adult obesity. This Gym Power Generation Machine project, which uses metabolized human energy to generate electrical power, could potentially address both these challenges.

Keyword : - 1. Battery , 2. DC Generator, 3. Rack & Pinion Mechanism, 4. Shaft, 5. Spring

1. INTRODUCTION

Man has needed and used energy at an increasing rate for his sustenance and wellbeing ever since he came on earth for few million year ago. Due to this lot of energy resources have been exhausted and wasted. Proposal for the utilization of waste energy of power generation by gym pulley is very much relevant and important for highly populated countries like India and china the people are crazy about gym.

In the modern age, there are more and more electrical devices which do the work that human beings once had to do physically. As more people spend more and more of their days in front of computers or any other equipment's without any movements, additional concerns, such as health and the exercise they need for healthful living are often overlooked. From the other side for people who want to be aerobically fit it's not common to spend hours for example exercise in gym that produces nothing but heat, why not have your-my-our workout and generate usable electricity at the same time.

2. PROJECT ANALYSIS:

2.1 Project Methodology:

Refers to the block diagram of the gym power station turning workout into electricity which consists of shaft connected to motor as generator, battery, inverter, transformer, and load.

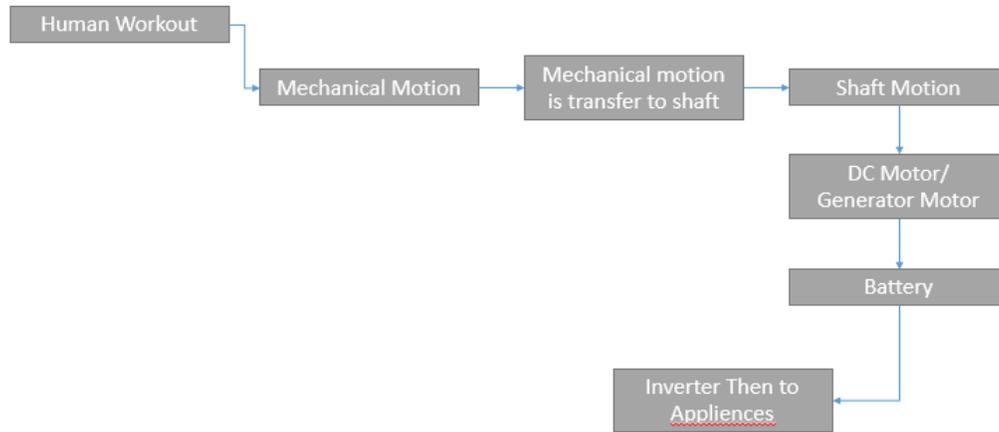


Figure: 1

The shaft is a part of gym equipment. The motor is used here is the 250W, 24V, 2650RPM motor. The working principle of motor is same as DC generator. To store DC voltage 12V, 7.5Ah, battery is used. To convert DC voltage to AC voltage further we can connect inverter circuit. The transformer in inverter is used to step up the voltage to 230 V. The load can be bulbs, laptop charger, mobile charger, musical system etc.

2.2 System Design



Figure: 2 Frame Diagram

The shaft is part of gym equipment. The Cast Iron (CI) frame is used in this mechanism. The working principle of frame is only the support of the mechanism, this mechanism various linking parameter are used in that way various type of part are placed in frame like DC motors, batteries, shaft component and etc.

3. WORKING PRINCIPLE :

A gym powered electric generator provides a method of generating electricity by means of a modified stationary gym equipment for use in electrical energy storage and running household or other appliances. Human/mechanical energy is converted into electrical by means of an electric generator that is connected to an exercise equipment. As result the energy created by the generator can be stored in various types of lead-acid batteries which may then be tapped at a later time, after dark for example, when the energy is needed to power lights or else. If AC appliances are in place then an inverter must be used to transfer the DC current into the standard 230 volts of AC current for usage by these appliances.

We hereby make use of an energy harvester system that moves in response to movement of the motion of a gym exercise machine for converting kinetic energy of the exercise equipment into electrical power. Our system makes use of the gripping rod connected to spring based motorized mechanism having rack pinion arrangement and multiple motors to power the system and generate power.

The system aims to provide resistance to exercise movement while generating power from the same thus serving dual purpose. The machine makes use of 1-3 motor arrangement to provide 3 levels of generation capability. The machine aims to generate electricity through horizontal motion created while workout. The spring based mechanism

4. ADVANTAGES :

- Efficient Generation
- Smart Power Generation Mechanism.
- Dual Purpose Machine.
- Power generation is simply walking on the step.
- No need of fuel input.
- This is Non -conventional system.
- Battery is used to store the generated system.

5. 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 etc. Some villages are facing problem of electricity shortage this system will help in this need. This project also help in mountain areas where electricity difficult to reach. Also at Colleges, Schools, and Gym center.

6. FUTURE SCOPE :

The fitness is important factor in modern life and people are interesting in gym exercise. This system is first implemented on gym bicycle. The other equipment's are available Leg Extension, Let Pull down, Adjustable Cable Crossover in the gym. This equipment's can be used to generate electricity. Hence gym can automate by using gym equipment's. It's our new approach to this future trend.

India planned for smart cities; the number of gym may be increases in the smart cities. And the today's generation is attracting towards the gym exercise. So the energy generated from the gym bicycle will contribute the big role. As number of gym equipment increases the total power generation will increase. It will definitely helpful in reducing today's energy demand.

7. CONCLUSION :

The project 'power generation by gym pulley' has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit.

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