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An Innovative Technique of Electricity Generation and Use of Washing Machine by Treadmill

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Abstract: ***Now, in modern digital day most of the newly invented technology depend on electricity for their proper functioning thus hence, the basic needs of human life are power, hence the demand of electricity generating method is increasing day by day. It can manipulate development any country of a world. Now, for developing electric power generation we have implemented an innovative idea of generating electricity from the use of the specially designed treadmill with the new specially designed washing machine, which will work when a human being runs over a treadmill for exercise, which is an integral part of modern digital society. India is a developing country because of it has limited resources. In India, most of the energy sources are diminishing day by day. On the other hand, conventional energy resources are responsible for pollution and global warming. That is why we need a non-conventional energy source to develop electric power generating which is eco-friendly, clean and sustainable. Increasing population of the world is also a major factor of increase in energy demand that is why scientists are exploring major and minor energy resources to fulfill energy demands.***

Keywords: Peddler generator, Exercycle, Treadmill

I. INTRODUCTION

There are many concerns on how to make this environment a better place to live. The Biggest issue of them all is our energy and power sources. The term used for sources of energy that are environmentally friendly is green energy. Primarily, this idea includes any source of renewable energy. The main focus of green energy is to use sources that cut down on pollution. In many countries, you can arrange to buy green electricity. There is higher cost involved in this option. Although this idea looks easy, a lot of people are suspicious about these sources of renewable energy [1]. It is clear that improving energy efficiency becomes a pivotal objective for organizations that seek to sustain in the highly competitive environment. Day by day we should more electricity according to present scenario. It's our assumption and also it is predicted by Energy Information Administration (EIA) that we will need 24.7 trillion kilowatt- hours till 2025. And this is also predicted that in coming days Coal will be almost in its final state in coming 150 years [2]. And it's important to think for the environment and growing population. A place where maximum energy conversions take place is, the Gym. If at all we can tap into this large pool of energy, we will be able to produce electricity enough to sustain that individual gym in-turn saving energy. Gyms, nearly all have large amounts of bicycles and treadmills. These are used virtually every hour the gym is open, so probably 8-12 hours a day. The amount of energy created by people using them is simply wasted because they are all stand-alone pieces of gym equipment [3].

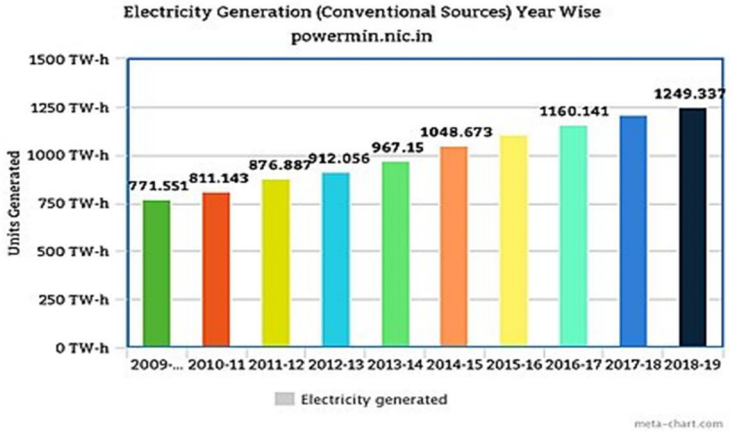

Fig1. Electricity generation in India till 2018-19[1]

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People simply have to work out in order to go green, when using green fitness equipment. An exercise routine of 30 minutes will generate 50 watts of energy which is enough to charge a Phone six times [4]. People are resistant to changing their lifestyles when it comes to combat climate change. But when you take what people do as a part of their daily routine and alter it to make it green, voila, the change is done for them. The kinetic energy from the workout is converted into usable, carbon-free energy which can be used to power the entire fitness center. Considering the how much of energy that is used to power a typical gym this idea is especially efficient (the machines, televisions, air-conditioners, etc.)

II. ELECTRICITY GENERATION

The electricity consumption is increased day by day (12%-15%). But the generation of electricity is not sufficient. So that conditions arises to load shedding and increase in price levels. So that whole world generates the power with the help from renewable energy sources, It is a time to think about generation of electricity through renewable energy sources instead of conventional energy sources. In this paper, we have implemented the basic principle, conversion of mechanical energy into electrical energy. In our research, we will produce electricity from kinetic energy through a pedal mechanism. The idea of our research is to utilize that type of kinetic energy whose are totally wasted in gymnasium through exercise bicycle or other gym equipment will be convert and produce electricity. It is simple way to produce energy from pedal mechanism [5].

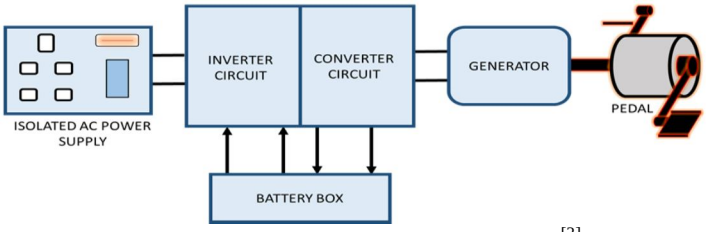

Fig.2. Block diagram of proposed system[3]

1) *Pedal Mechanism:* Normally the most important aspect of pedaling is to pull backwards at the bottom of the pedal stroke. As the pedal moves towards the bottom switch from a pushing down motion to a pulling back movement [6].
2) *Gearing System:* Gear is a device which is usually transmit the power torque and change the direction with the help of gear to increase or decreased the speed. The gears in a transmission are analogous to the wheels in a crossed, belt pulley system. A perfect gearing system consist zero percent slippage [7].

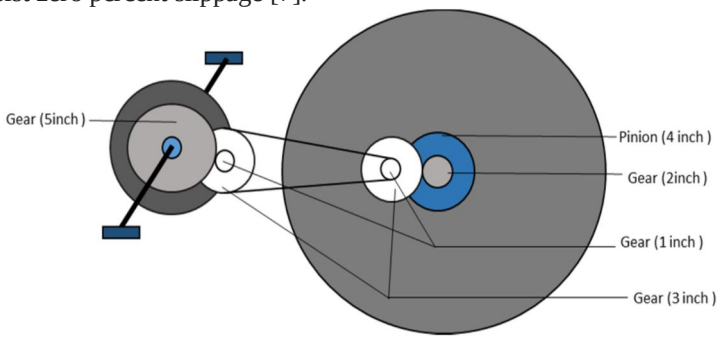

Fig.3 Gearing system[2]

3) *Fly Wheel:* A flywheel is a circular wheel attached to the crankshaft of the engine that stores the mechanical energy of the engine during power stroke and imparts that stored energy to the preparatory strokes during the engine working.
4) *Generator:* A system whose generates electricity. This system converts from mechanical energy to electrical energy. This system working principal is totally based on the Flemings right hand rule. Sources of mechanical energy include, wind turbines and even hand cranks [8].
5) *Converter and Step Down Transformer:* Converter is used for converting from a.c.to d.c. and step-down transformer is used for decreasing in voltage value for charging the battery. The energy generation from gym equipment can be also enhanced as now a day most of the population are health conscious and they are spending time for exercise in gym. A Stepdown transformer is a type of transformer, which converts a high value of voltage to a low value of voltage. In other words, the primary coil of transformer has more turns than the secondary coils [9].

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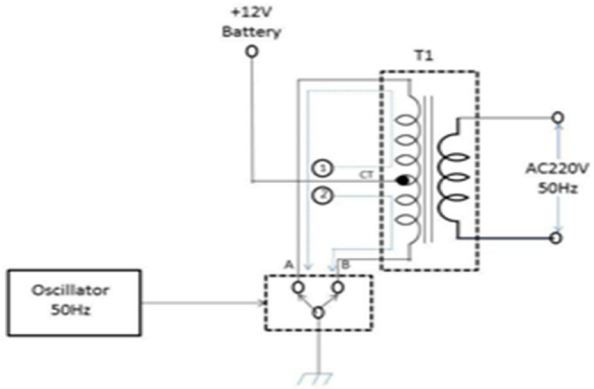

Fig.4 Charging circuit[4]

6) *Battery:* A 12v lead acid battery is used to conserve electrical energy and to keep supply continuously after paralyze power supply [10].
7) *Inverter Circuit & Stepup Transformer:* This is used for converting from d.c.to a.c. and used to increasing for voltage value for supply [11].

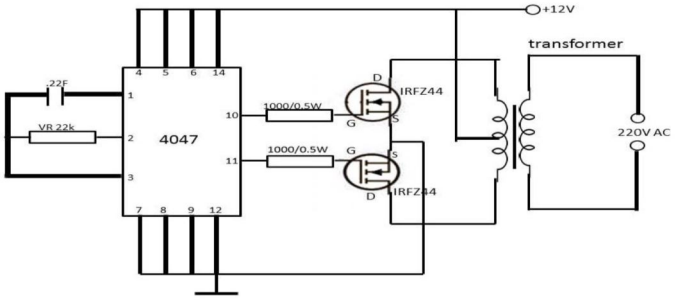

Fig.5 Inverter circuit[6]

III. OUTAGE ANALYSIS

A. Power Calculation

The concept is "The average human generates around 100 watts in a day. this also means that 2500 kilocalories are used by the body in a day. With 2500 kilocalories of energy, the body is able to function properly. This allows you to do everyday activities such as reading, jogging, sleeping, etc"

1 calorie 4.2 joules

2500 kilocalories = 1.05 x 107 J

1 day 86400 s & P = W/t = 1.05 x 107 1/86400 s = 121.5 W

Normally a man can produce a power of 100 watt in a day from gym equipment. 1 day —100 watt 30 days = 30x100 watt = 3 Kilo Watt

With the amount of 3-Kilowatt power 03 Celling Fan can run minimum 08 hours in a day

Appliance	Watts	No.	Hours	Watt x Hours	Units /day
Ceiling Fans	100	3	8	2400	2.40

If the charge for electricity is 04/- per unit then the monthly electricity bill of 03 celling fan will be

2.4 x 30 = 72 unit/day &

72 x 6 = 432 Rupees

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So, power generation by a single human on a single exercises machine is saving 432 rupees per month [12].

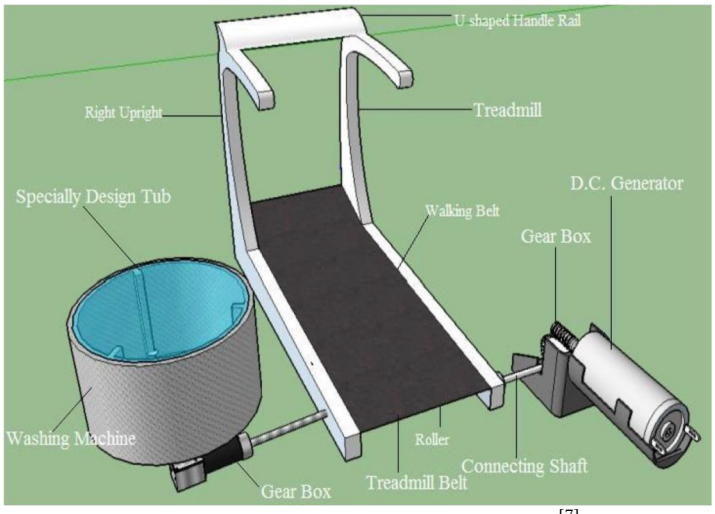

Fig.6 Washing machine using treadmill[7]

IV. RESULT

We implement an innovative exercise equipment for generation of electricity. By using bicycle, alternator, inverter, battery, step up and step-down transformer, rectifier and incandescent lamp. We successfully take the 230 V single phase 50 Hz output supply and it is used to light 40W incandescent lamp. When the exercise machine is not used, the main supply is used to charge the battery.

V. FUTURE SCOPE

The energy generation from gym equipment can be also enhanced as now a day most of the population are health conscious and they are spending time for exercise in gym or another suitable place.

If we brought together flywheel and voltage protection devices and start a mass can be more useful to us in future. It would be a model all over the world.

VI. CONCLUSION

We design and implement an innovative exercise equipment to generate electrical power for the house appliances. Energy demand is necessary and important within renewable energy systems to ensure stability of the system. These models vary in complexity and accuracy and therefore the model chosen must match the application for which it is needed. This system will be very helpful for the rural areas. In this day where the world is challenged to be more responsible in its sourcing of electrical power, the method of human power generation could be a solution that also helps mitigate the issue of obesity and overweight. This is totally ecofriendly, it could efficiently for the current issues; source of electrical power, reducing the effect of CO_2 to the atmosphere.

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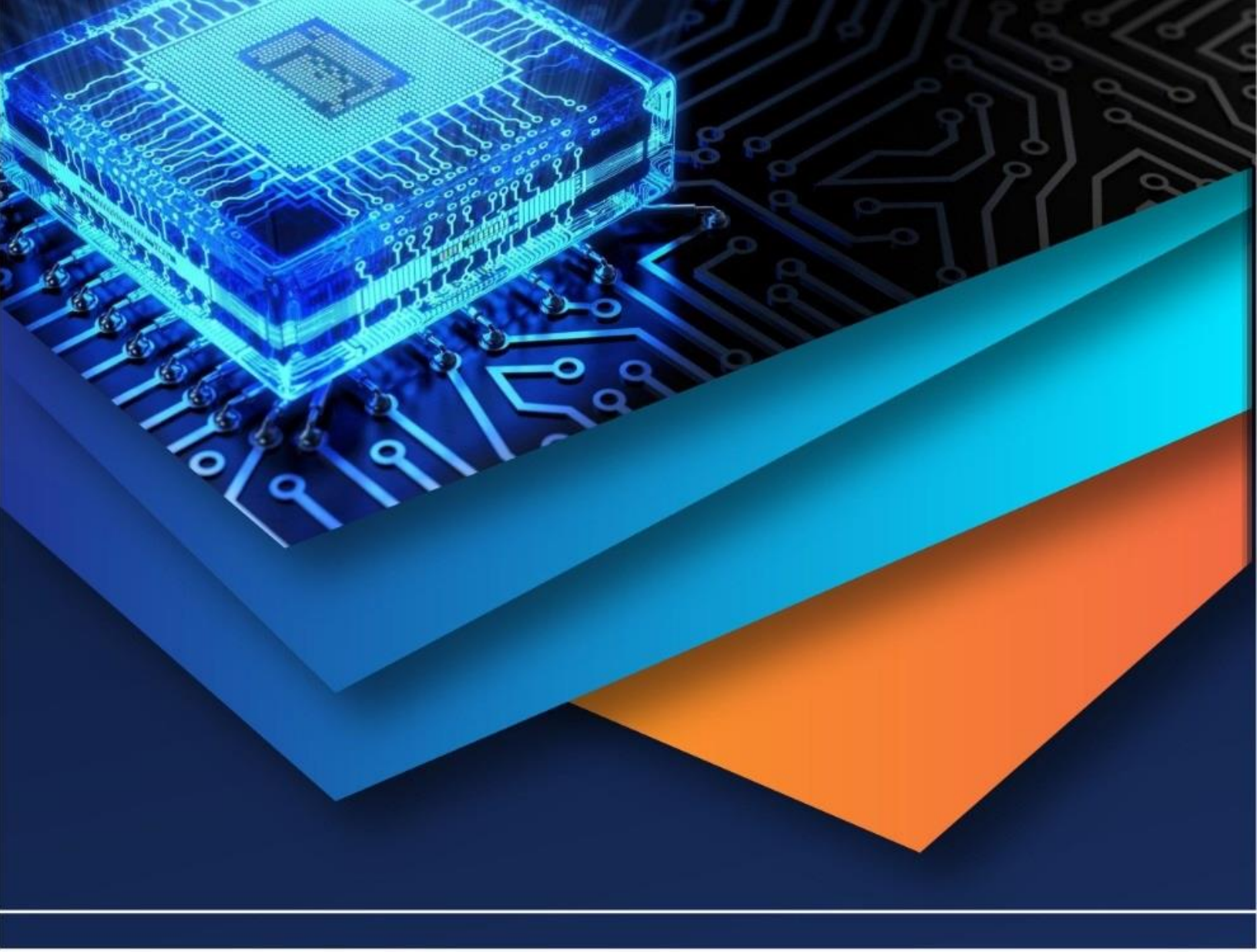

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