

Design Foot Step Power Generation using Microcontroller

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Abstract— Whenever people walk on foot step, they lose their energy. We have designed such a mechanism in which we have used this waste energy to generate electricity. Foot step electricity generation as such is not a new concept. There were many attempts in the past pneumatics, piezoelectric materials etc, but all of them proved very costly and were not practically feasible in day-to-day real life. The persons, who are walking on foot step are applying the impact force or thrust on the spring loaded stair case steps. This impact pressure energy can be utilized to operate the energy flywheel through unit-directional ratchet arrangement using chain and sprocket wheel drive. The flywheel, which stores the energy and utilizes it for continuous rotation, rotate alternator that generate electricity. It is best use of non conventional source of energy, saving of coal and water for generating electricity, eco friendly, simple mechanism, easy for installation, easy for maintenance. It can be used on railway station, airports, shopping mall, jogging parks. The project is developed keeping in mind the idea of generating electricity from non-conventional means, which is free from pollution and can be used directly in real life, i.e. it is not just a concept but a future.

Keywords: Flywheel, Piezoelectric, Spring Gear

I. INTRODUCTION

A. Foot Step Power Generation:

The usage of traditional power generation method such as burning of coal, wood, diesel (generators) etc. is continuously depleting our natural resources such as fossil fuels, which is the demand for power has exceeded the supply due to the rising population. In addition to this the traditional methods cause pollution.

B. Global Warming:

Global warming is the increase in the average measured temperature of the Earth's near-surface air and oceans since the mid-20th century, and its projected continuation. Global surface temperature increased 0.74 ± 0.18 °C (1.33 ± 0.32 °F) during the 100 years ending in 2005. The Intergovernmental Panel on Climate Change (IPCC) concludes that most of the increase since the twentieth century is "very likely" due to the increase in anthropogenic greenhouse gas concentrations. Natural phenomena such as solar variation combined with volcanoes probably had a small warming effect from pre-industrial times to 1950 and a small cooling effect from 1950 onward.

Climate model projections summarized by the IPCC indicate that average global surface temperature will likely rise a further 1.1 to 6.4 °C (2.0 to 11.5 °F) during the twenty-first century. This range of values results from the use of differing scenarios of future greenhouse gas emissions as well as models with differing climate

sensitivity. Although most studies focus on the period until 2100, warming and sea level rise are expected to continue for more than a thousand years even if greenhouse gas levels are stabilized. The delay in reaching equilibrium is a result of the large heat capacity of the oceans.

Increasing global temperature is expected to cause sea levels to rise, an increase in the intensity of extreme weather events, and significant changes to the amount and pattern of precipitation, likely including an expansion of the subtropical desert regions. Other expected effects of global warming include changes in agricultural yields, modifications of trade routes, glacier retreat, mass species extinctions and increases in the ranges of disease vectors. Remaining scientific uncertainties include the amount of warming expected in the future, and how warming and related changes will vary from region to region around the globe. Most national governments have signed and ratified the Kyoto Protocol aimed at reducing greenhouse gas emissions, but there is on-going political and public debate worldwide regarding what, if any, action should be taken to reduce or reverse future warming or to adapt to its expected consequences. Global dimming, the gradual reduction in the amount of global direct irradiance at the Earth's surface, may have partially mitigated global warming in the late 20th century. From 1960 to 1990 human-caused aerosols likely precipitated this effect. Scientists have stated with 66–90% confidence that the effects of human-caused aerosols, along with volcanic activity, have offset some of the global warming, and that greenhouse gases would have resulted in more warming than observed if not for these dimming agents. Ozone depletion, the steady decline in the total amount of ozone in Earth's stratosphere, is frequently cited in relation to global warming. Although there are areas of linkage, the relationship between the two is not strong.

II. PROPOSED SYSTEM

These systems may generate voltage on each and every step of a foot. For this purpose, piezoelectric sensor is used in order to measure force, pressure and acceleration by its change into electric signals. This system uses voltmeter for measuring output, led lights, weight measurement system and a battery for better demonstration of the system.

- Whenever force is applied on piezoelectric sensor, then the force is converted into electrical energy.
- In that movement, the output voltage is stored in the battery
- The output voltage which is generated from the sensor is used to drive DC loads
- Here we are using AT89S52 to display the amount of battery get charged.