



DEVELOPMENT OF FOOTSTEP ELECTRICITY ENERGY
GENERATING MACHINE USING DUAL GENERATOR

Igbo, Ebomuche Bright, Bori Ige
Department Of Mechanical Engineering
Federal University Of Technology, Minna

ABSTRACT

Footstep electricity energy generation machine have been seen in most populated country and the different existing machines have various capacity of generated electricity power. The concept and the technology is simply the production of electricity energy by weight which acts on the footsteps. Footstep electricity energy generation is of three types namely; rack and pinion, piezoelectric method and fuel and piston method. It was comparatively discovered that the rack and pinion mechanism is more effective, efficient with less cost of operation and maintenance. In the existing rack and pinion method energy was not adequately harvested from footsteps as a result many gears, shafts and incorporation of a single generator. This takes time to generate electricity and the output capacity is low in watt. With this motivation, a prototype footstep electricity energy generating machine using dual generators, chains and sprockets was developed. This was designed by considering parameters such as human weights, speed and low cost. The prototype was designed to be a value for money production in the power generation sectors. For designing the work rack and pinion and human weight were studied to understand the operation. At the end the machine was fabricated using local material. The machine upon fabrication was evaluated at ten (10) different human weights of 40, 50, 53, 56, 60, 70, 85, 101, 105, 108 kgs and power of 6.69, 6.949, 3.92, 10.848, 8.29, 8.339, 12.064, 11.349, 11.359 and 11.359 watts with angular speed of 5.08, 5.28, 2.98, 8.24, 6.30, 6.33, 9.16, 8.62, 8.63, 9.35 rpm were obtained respectively. The result showed that weight is directly proportional to both power and angular speed. The result showed that optimism occurred at 85kg. Further evaluation showed that any power incrementing due to addition of weights after this point is of negligible watt. Using a dual generators increase higher electricity energy generation and effective and efficient harvesting of footstep energy. The low cost makes it very suitable for both rural and low earners. It is recommended to design generators that can be turn by little human weights. It

Keywords: Energy, Electricity, Generator, Rack, Pinion, Weight, Footstep and Power

INTRODUCTION

Oyadepo, S.O.(2017), stated that in Nigeria access to efficient and effective supply of energy has been a big problem for both the urban and rural inhabitants. The problem however is more challenging in the rural area where only 10% of electricity is been access by the population. The miniature electricity provided hinders the country's growth, development and not only reducing activities to basic human needs, adversely affect human life. The available energies are not performing to the installed capacity, costly and beyond the reach of many Nigerians. Renewable energy technology may be considered as the main tool our society needs to replace the fossil-fuel-based energy systems. Renewable energy may be defined as the gathering of not manmade energy flows (such as; rainfall, ocean currents and tides, sunlight, wind waves), whose replacement is higher than the man using rate (for instance biomass, ocean thermal gradients and hydropower reservoirs).