Abstract

Currently, electric energy needs of mobile electronic devices rely on batteries which have limited lifetimes and recharge is still dependent on the source of electrical energy from the electric company. On the other side, walking/running human activity stored potential kinetic energy that can be utilized as a renewable alternative energy sources. In this final project we report the results of prototype design and testing of biomechanical energy harvester mechanism of angular motion of knee flexing on walking/running human activity.

The method used to generate electricity is the magnetic induction (electromagnetic effect). The kinetic energy of motion of walking/running human who saved the knee flexing angular kinematics was captured by the mechanism consisting of multiple pairs of micro-size gears and then modified using the power generating system into electrical energy through the rotation of the magnet around the coil. Voltage and AC current generated is converted to voltage and current DC using rectifier circuit. Prototype tested on two subjects with the variation velocity of walking and running.

From this final project created a prototype and the result is the amount of voltage and current testing of both AC and DC generation due to the influence of variations speed of walking/running. The prototype of this design results can be authorized for the development of mobile charger/power supply of mobile workers to meet the needs of human movement of electrical energy for mobile electronic devices.

Keywords: Human motion, kinetic energy, energy harvester mechanism, magnetic induction, electrical energy.