Transforming Alternate Current (AC) to Direct Current (DC) via Kinetic Energy

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A circuit was created in order to transform alternate current to direct current using kinetic energy with piezoelectric sensors. Those sensors are capable of producing 5 V to 10 V. The hypothesis was based on the possibility to design a circuit which can transform alternate current from kinetic energy to direct current with piezoelectric sensors. The circuit was placed on the base of a shoe to obtain kinetic energy while a person walked. Different tests were performed to measure the current using a multimeter, an oscilloscope, and android phone app called Ampere. Both instruments registered that current was successfully generated with the foot motion using a 3.7 V to 4.2 V battery and the piezoelectric sensors. Results showed that the current varies depending on walker's speed. When a 64.8 kg person walked during intervals of 5 s, 15 s, 30 s, and 50 s, the piezoelectric sensors generated a maximum of 550 mA. When the same person ran during an equal period of time, the sensors generated a maximum of 725 mA. Furthermore, the current was used to check if it was capable of charging a mobile phone. When charging the phone while walking, the current was from 200 mA to 400 mA as measured by the app called Ampere. When charging the phone while running, the current was from 350 mA to 570 mA as measured by the same app. The hypothesis was accepted since the conversion of alternate current to direct current was successful.

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