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WIRELESS POWER REAPING USING PELTIER SENSOR

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Abstract
In recent years, a large amount of heat is dissipated from various equipments such as motors, generators, compressors etc. where as a large amount of heat is evolved because of various losses mainly due to resistive heating or D.C offset effect. The heat losses dissipated is the major cause for the reduction in efficiency of the machine. But this heat can also improve the battery capacity when utilized in proper way. According to basic law of conservation of energy, 'Energy can neither be created nor destroyed, but can be transferred from one form to another'. Thus this can be used as a weapon for the generation of electricity by using an element called Peltier sensor. By using Peltier sensor, the heat losses which are dissipated from the machinery is converted into electrical energy which can be utilized by the same load or can be used to drive other load. The power generated is transmitted by using Wireless Power Transmission technique (WPT) is adopted for transmission of generated power to the load. A wireless charging Mechanism is utilised for various machineries especially electric vehicle to detect and indicate amount of charge transferred the battery using GPRS-GSM module and Internet of Things (IOT) module.

Keywords--- Wireless power transmission, Peltier sensor, Electric vehicles, Internet of Things

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INTRODUCTION

Power reaping is the practice by which power is derived from exterior resources (e.g., solar power, thermal energy, wind energy, salinity gradients, and kinetic energy, also known as ambient energy), confined, and hoard for small, wireless autonomous devices, like in wearable electronics and WSNs. WSNs have participated a chief position in many watching and supervision claims together with ecological braining, intention trailing, structural fitness watching as conformist feelers are motorized by batteries, the limited battery facility blocks the huge-range exploitation of WSNs. Although there are many power-aware approaches developed in the past decade to shrink sensor power consumptions or sense power expenses among feelers the lifetime of WSNs stays a foremost routine restricted access in their factual exploitations, since wireless data transmission consumes considerable feeler power.

To diminish the limited power dilemma in feeler networks, researchers projected various different capable approaches. One process is to enable feelers to reap ambient power from their neighborings such as solar energy, vibration energy, and wind energy. On the other hand, the temporally and spatially varying environment of renewable power resources makes the forecast of sensor power reaping speeds very complex.

A latest burst through in the wireless power transfer system based on sturdy coupled magnetic resonances has strained bounty of considerations in the research society established that it is possible to attain an estimated 40% effectiveness of wireless power transfer for powering a 60W light bulb from a expanse of two meters without any wire lines and plugs. Industry research further attained a 75% effectiveness of wireless power transfer for transferring 60W of power over a expanse of up to two to three feet.

A number of viable artifacts based on the wireless power transfer technology now are accessible in markets such as feelers, RFIDs, cell phones and auto vehicles. It is accounted that the wireless power transfer market is estimated to raise from just $216 million in 2013 to $8.5 billion in 2018. Armed with this sophisticated technology, feelers can be charged at sturdy and high charging speeds. An additional burst through in the ultra-fast charging battery materials further improve the feasibility of the wireless power transfer technique.

Scientists from MIT implemented an ultra- fast charging in material *LiFePO*4 which can be accused at a speed as high as 400 *Coulombs* per second. The duration of fully-charging a battery thus can be shortened to a few seconds.

As a result wireless power charging is a very potential technique to extend the lifetime of WSNs. In this paper we employ multiple mobile chargers (i.e., charging vehicles) to replenish feeler power in a large-scale WSN for a given monitoring period T so most existing studies on feeler charging scheduling employ mobile chargers to charge all feelers occasionally.

MATERIALS & METHODS

Existing Method

In the existing system, power reaping is very importance for the developing country because of increase company and factory they required power. So the power reaping is very importance. And the renewable power reaping from the environment is depend upon climate change. So the variation of power is present as output so it's highly drawback of the present system.

Projected Method

In the proposed system, elegant power generation and distribution scheme is implemented. Here the power is generated by using Peltier Sensor which converts the thermal into the electrical energy. The power is generated from the engine heat of the vehicle and the generated voltage is store in the external battery. The stored energy is transferred to the local substation using WPT technology. And the cost of energy is added to the user account using GSM module. If the user can use the money for full up fuel in any petrol bank.

Block Diagram

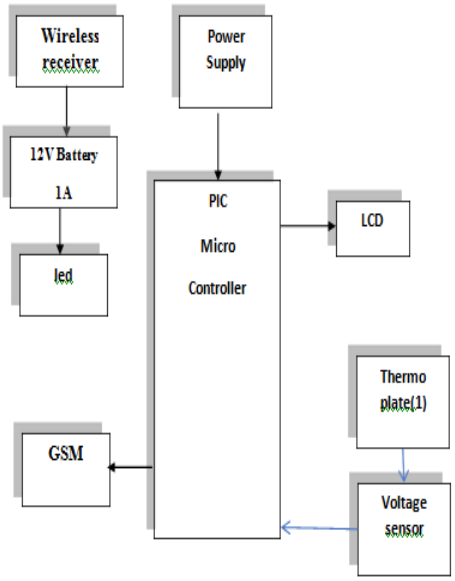

Figure 1. Proposed System

Transmitter Section

Figure 2. Transmitter Section

Receiver Section

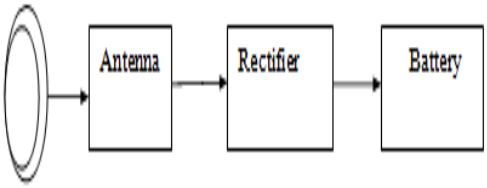

Figure 3. Receiver Section

IoT Section

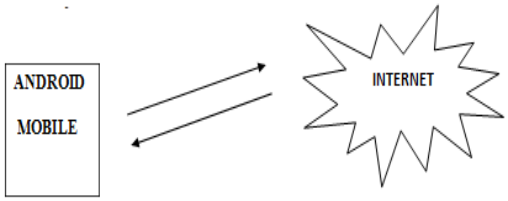

Figure 4. IoT Section

Description

In this project, Peltier is used for generation of power from the engine heat losses and voltage is stored in battery for power transfer to another end of the coil. And the generation voltage range is updated to server via bluetooth module, so the server maintains the data details and converted to the money for cost free fuel fill up. Here PIC microcontroller is used for monitoring and controlling entire section. WPT concept is included for the exchange of energy from source to destination coil.

RESULT AND DISCUSSION

The main idea of this project is to create electricity from heat evolved during soldering of equipments and then transferring the power project using wireless communication. The heat energy evolved is absorbed using the peltier sensor and the gets converted into electrical energy which is transmitted to adjacent circuit wirelessly to glow an led. In this project we have also given a feature which intimates the user the amount of voltage generated using Peltier to their mobile phones. Input to the system is given by the soldering machine to the Peltier sensor which absorbs the heat losses and converts them into electrical signals. The electrical signals generated are about 3V which are used to glow the load i.e. an LED of 1A which is connected to the input through a wireless power transmission technique. The PIC micro-controller controls the entire system and takes decisions depending upon the needs and necessaries. GSM modem is utilized to get timely messages regarding how much amount heat is converted into voltage.

CONCLUSION

A considerable amount of power is being generated from the useless heat of the machinery by using a simple Peltier sensor. A voltage of about 3V is being generated just from a heat of about 150^{0}C which is here generated using soldering kit and the amount of voltage generated is intimated to the customer by using a GSM/GPRS module. Thus in this way a large amount of electricity can be generated using Peltier sensor from the various heat losses in the machines and this helps in increasing the efficiency of the machine. To sustain the battery at-least for some more time this project can be used, so that the electricity produced using the Peltier sensor is used to charge the battery which is sufficient to drive the loads. There is a lot of scope in the future for this technology to be implemented in the electrical vehicle i.e. In sequence to increase the efficiency of the vehicle this method of approach can be adopted by using a stack of Peltier sensor.

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