WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Smart Footstep Power Generation Using RFID for Mobile Charging in Public Places

[1.]R.Karthikeyan, [2]B.Ajith, [3]S.Chandru, [4]M.Harish, [5]S.K.Dhamodharan, [6]P.Karthikeyan [7]Thiru.M.P.S. Saravana Senthil., B.E., M.S., L.M.I.S.T.E.,

[1 to 6]. Department of Electronics and Communication Engineering Rajagopal, Polytechnic College, Gandhi Nagar, Gudiyattam

[7].Head of The Department(i/c), Electronics and Communication Engineering, Rajagopal Polytechnic College, Gandhi Nagar, Gudiyattam

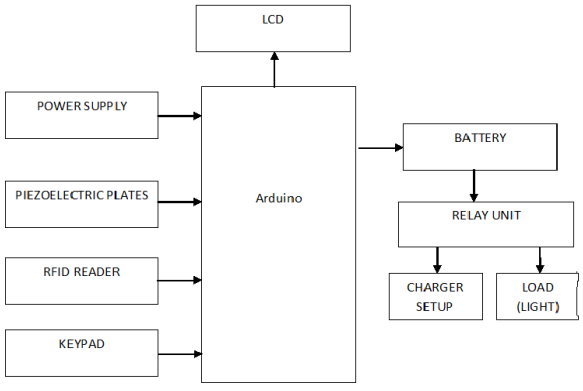
ABSTRACT:

As the population of the country grows, so does the need for electricity. At the same time, energy waste is increasing in a variety of ways. The key solution is to transform this energy into a useable form. We generate power with the use of human footfall in this footstep power generation project, which is then used to charge a battery. The energy is stored in a battery that may be used to charge a phone using an RFID card.

1. INTRODUCTION

The ability to work is referred to as energy. Nowadays, power has become a source of assistance to the human population. Its demand is rapidly growing. Every day, living innovation necessitates a large amount of electrical power for its various tasks. The single largest source of pollution in the world is power generating. As a result, a large amount of energy is created and wasted. Power is usually created from resources such as water, wind, coal, and so on. To generate electricity from these resources, large plants are required, which require a lot of maintenance and are expensive. Similarly, the current development aims to provide a technique for generating electrical power from which a continuously growing human population does not have a negative impact on natural resources. This idea is based on a law known as the piezoelectric effect impact, which states that some materials can create an electrical charge when they are subjected to weight and strain. The piezoelectric effect is the ability of some materials to create an electric charge when mechanical stress is applied to them. Mechanical vibrations, pressure, or strain given to the piezoelectric material are turned into electrical form through this effect. Piezoelectricity refers to the ability of a few materials to generate an electric potential in the presence of a load. The inserted piezoelectric material can provide the illusion of weight loss by putting people into an electric current that is stored in a battery and then disseminated using RFID cards.

BIOCK DIAGRAM



WORKING

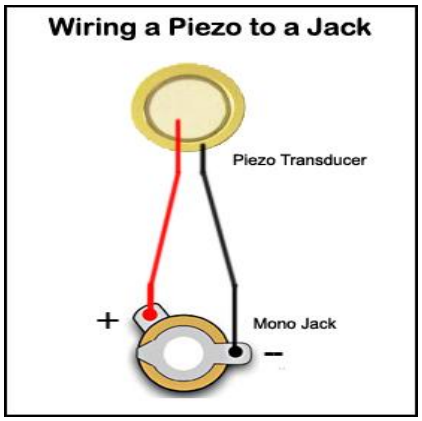
The Arduino IDE, RFID sensor, USB cable, and LCD are all included in this system, which is powered by an Atmel Mega 328 microcontroller. When we turn on the computer, it goes into registration mode. We have three users that we can add. After all of the users have been entered into the system, the system will prompt you to swipe your card and connect the charger. Initially, all users are given a default charge time of 5 minutes. When we swipe the card, the system goes on for charging and charges the mobile phone if the user is approved. If the user is not authorized, the system will indicate unauthorized user; however, if the user wants to halt charging in the middle of the transaction, the user must swipe the card again. The remaining time balance is displayed and the charging stops as soon as the card is swiped again. To recharge a card, click the recharge button on the system; the system will then ask the user to swipe the card; once the user swipes the card, it adds another 5 minutes to the user's card.

ARDUINO UNO.

"Arduino is an open-source electronics prototyping platform with flexible, user-friendly hardware and software." It's for artists, designers, enthusiasts, and anyone else who wants to make interactive things or surroundings." The Arduino Uno is a microcontroller board that uses the ATmega328 microcontroller (datasheet). There are 14 digital input/output pins (six of which can be used as PWM outputs), six analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button on the board. It comes with everything you'll need to get started with the microcontroller; simply plug it into a computer with a USB cable or power it with an AC-to-DC adapter or battery.

The Uno is unique in that it does not employ the FTDI USB-to-serial driver chip found on previous boards. Instead, it uses a USB-to-serial converter based on the Atmega16U2 (Atmega8U2 up to version R2).

PIEZO ELECTRIC



This diagram depicts the simplest wiring configuration: a single piezo transducer connected directly to a mono (two pole) connector. Many first-time CBG builders utilize this approach when they want to be able to plug their design into an amp. Many builders stick to this basic arrangement and never feel compelled to upgrade — and there's nothing wrong with that! This configuration will produce a simple sound that is highly dependant on where the piezo is positioned and how it is put in the box — for more information, visit our articles on piezo basics.

One frequently asked topic is whether the polarity of the piezo wire you connect to which jack pole affects. Or, to put it another way, does it matter if the red or black wire is connected to which pole on the jack? The basic answer is that it doesn't – regardless of how you connect it, you'll get the same sound. However, it is a good practice to connect the ground (black wire) to the ground pole at all times. It isn't critical with a straight piezo-to-jack connection, but when wiring jobs become more complex, consistency makes debugging a LOT easier!

RFID

Radio-Frequency Identification is the abbreviation for Radio-Frequency Identification. Tiny electrical devices consisting of a small chip and an antenna are referred to by the abbreviation. The chip can normally hold no more than 2,000 bytes of data. The RFID device works in the same way that a bar code or magnetic strip on the back of a credit card or ATM card does: it gives the object a unique identity. In the same way that a bar code or magnetic strip must be scanned to obtain information, the RFID device must be scanned to obtain identifying information.

RFID (Radio Frequency Identification) tag

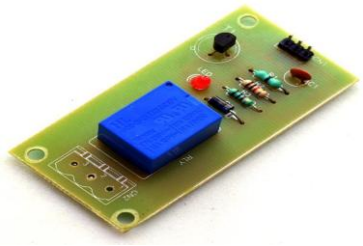
An RFID tag is a microchip that is paired with an antenna in a small container that is designed to allow the RFID tag to be affixed to a tracked object. Radio Frequency Identification is the abbreviation for Radio Frequency Identification. The antenna on the tag takes up signals from an RFID reader or scanner and then transmits the signal back to the reader or scanner, usually with some additional data (like a unique serial number or other customized information). RFID tags can be as small as a giant rice grain in size. Others could be as small as a small paperback book.

KEYPAD

It is also possible to employ several additional modules linked to the development system through the I/O port connectors, such as a compact keyboard or set of buttons for operating a portable electronic device, telephone, or other equipment. Some of the extra modules can function independently of the microcontroller and can be used as such. A keypad is a collection of buttons that are placed in a block or pad to perform a certain purpose. It has five keys that are placed in a matrix arrangement. The microcontroller's pulses are utilized to switch keys on a keypad. Pull-down resistors should be added on the microcontroller's input pins to define logic state when no button is pressed, allowing the keypad to function properly. It is identified which button is pressed by mixing zeros and ones on the output pins. Switching does not necessitate a separate power supply. The keypad can be used to switch between many inputs.

RELAY

An electromechanical switch that is operated by an electric current is known as a relay. The driver circuit, power supply circuit, and isolation circuit are all found on a single relay board. With that circuit, a relay is built. Transistors are used in the driving circuit to perform switching actions. The transistor is used to turn on and off the relay. An isolation circuit protects the controller and transistor from damage by preventing reverse voltage from the relay. The microcontroller unit provides the input pulse for switching the transistor. It's used to turn on and off a single device.



BATTERY

Chemical energy is immediately converted to electrical energy by batteries. A battery is made up of a certain number of voltaic cells. A conductive electrolyte comprising anions and cations connects two half-cells in series to form each cell. Electrolyte and the negative electrode, to which anions (negatively charged ions) migrate, are in one half-cell; electrolyte and the positive electrode, to which cations (positively charged ions) migrate, are in the other half-cell. The battery is powered by redox processes. During charging, cations are reduced (electrons are added) at the cathode, while anions are oxidized (electrons are withdrawn) at the anode. [11] The electrodes do not come into contact with one another, but the electrolyte connects them electrically. For each half-cell, certain cells require distinct electrolytes. A separator permits ions to pass between half-cells while keeping the electrolytes separate. The ability to drive electric current from the interior to the exterior of the cell determines the electromotive force (or emf) of each half-cell. The difference between the emfs of the cell's half-cells is the net emf of the cell. [12]

CONCLUSION

The project "Smart Footstep Power Generation Using RFID for Mobile Charging in Public Places" is well-designed. Second, RFID technology can be used to charge just approved people's phones. This technology can show the charge generated by our footstep on an LCD screen. As a result, the project has been designed and tested successfully.

REFERENCES

1] Prabaharan R, Jayramaprakash A, Vijay Anand. “Power Harvesting by Using Human Foot Step”- International Journal of Innovative Research in Science Engineering and Technology, vol.2, issue 7, July 2013

2]Ramesh Raja R, Sherin Mathew.”Power Generation from Staircase (steps)”- International Journal of Innovative Research in Science Engineering and Technology, vol.3, Issue 1, February 2014

3] Power Generation Using Foot Step Method

4] Itika Tandon, Alok Kumar.”A Unique Step towards Generation of Electricity via New Methodology”- International Journal of Advanced Research in Computer and Communication Engineering, vol.3, Issue 10, October 2014

[5] Kiran Boby, Aleena Paul K, Anumol. C.V, Josie Ann Thomas, Nimisha K.K." Footstep Power Generation Using Piezoelectric Transducer”- International Journal of Engineering and Innovative Technology, vol.3, Issue 10, April 2014

[6] Jose Ananth Vino, AP.”Power Generation Using Footstep”- International Journal of Engineering Trends and Technology, vol.1, Issue 2, May 2011

[7]Alla Chandra Sekhar, B Maruti Kishore, T Jogi Raju.”Electromagnetic Foot Step Power Generation”- International Journal of Scientific and Research Publication, vol.4, Issue 6, June 2014

[8]Shiraj Afzal, Farrukh Hafeez.”Power Generation Footstep”- International Journal of Advancement in Research and Technology, vol.3, Issue 4, April 2014

[9] K. Ramakrishna, Guruswamy Ravana, Venu Madhav Gopaka.”Generation of electrical Power through Footsteps”- International Journal of Multidisciplinary and Current Research

[10]Umeda, M., Nakamura, K., and Ueha, S. Energy Storage Characteristics of a Piezogenerator Using Impact Vibration. Japan Journal of Applied Physics, Vol. 36, Part 1, No. 5b, May 1997, pp.3146-3151.