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Harnessing the Power of the Sun: Coin Based Mobile Charging

Dr.A. Raghava Raju
Electronics And Communication Engineering Guntur Engineering College, JNTUK, Guntur, India

Anuhya Vinnakota
Electronics And Communication Engineering Guntur Engineering College, JNTUK, Guntur,India

Pere Veera Sivudu
Electronics And Communication Engineering Guntur Engineering College, JNTUK, Guntur, India

Maddula Sudheer Kumar
Electronics And Communication Engineering Guntur Engineering College, JNTUK, Guntur, India

M D Sharukh
Electronics And Communication Engineering Guntur Engineering College, JNTUK, Guntur, India

Maddirala Mani Kumar
Electronics And Communication Engineering Guntur Engineering College, JNTUK, Guntur, India

***Abstract*:- Handy electronics like mobile phones are among the most important devices everyone takes across the globe as global communication becomes one of the fundamental aspects of our lives. In rural India, there is a lack of readily accessible electricity, which is necessary for using such devices because they must be charged. Consequently, a solar-powered, wending machine-like system for charging cell phones has been suggested. The microcontroller is powered by the tracking solar panel device that charges the battery. The user-accessible charging capacity will be managed by the microprocessor**

Keywords:- Arduino, Relay module DC, Solar panels,Solar charge controller, LCD, IR sensors, Battery

INTRODUCTION:

The mobile phone industry, which is presently worth billions of dollars and supports millions of phones, has emerged as a significant means of business and personal communication. It is crucial to offer a public recharge service. The coin-based mobile battery charger created as part of this project offers a special service to rural residents who do not have access to grid electricity during all or part of the daytime, and it generates income for site operators. The coin-operated mobile battery charger can be placed outside of any commercial building quickly and easily.Ordinary solar panels typically only face one direction.which means they may not receive enough sunlight to function. The solar panel charge controller and power optimization are suggested in this summary. Thus, itwill function while maximizing power by using the entiresun's light. The primary goal of this effort is to automatically control the solar panel and keep its face facing the sun. This is accomplished by managing the solar panel's motorized movement. Sun typically emerges in the east and sets in the west. In a typical system, if it faces east, it cannot alter its direction in relation to the sun at sunset. The market for mobile phones has grown tremendously in recent years, necessitating constant, on-the-go battery charging. In many developing nations, there are daily periods of time when grid electricity is unavailable, particularly in semi-urban and rural regions where mobile phones are the primary form of communication. However, metropolitan dwellers use more.

LITERATURESURVEY:

This paper serves as a resource for the IoT-based coin-based mobile charging project. Typical mobile charging devices have some drawbacks because of the energy issue. This project utilises solar electricity and an Arduino. The coin-based mobile recharge in The Proposed Methodology is powered by solar energy. Our cell phones can be charged. We charge at night with an extra battery's assistance. Charge our cell phones with coins like the one rupee, two rupee, and five rupee. It must be adaptable enough to show on a led whether it is charged or not.

1.PROPOSINGMETHOD:

1.1 BLOCKDIAGRAM:

The suggested method aids in communication for utilizing the power of the sun: coin-based mobile charging, which enables us to charge our mobile devices using solar power. to put money in that machine by using solar energy.

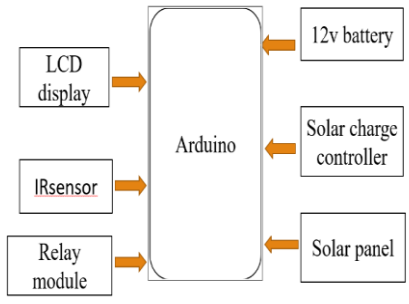

*Fig1:*BlockDiagramforProposingMethod

This IR sensor and Relay modules is connected with the help ofconnectingwirestotheArduino. Technical and Therapeuticinnovations are there to improve the quality.Our goal is to develop a device which should beeasytouseandshouldbeaffordablewhichconsists of the coin based mobile charging machine by using the solar energy.

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1.1. HARDWARE REQUIREMENTS:ARDUINO:

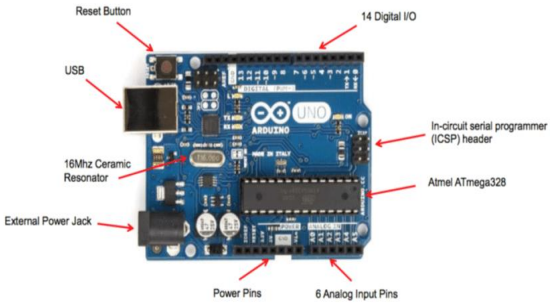

Fig2:PinConfigurationofArduino

The Arduino Uno is an open-source microcontroller device created by Arduino.cc and first made available in 2010. It is built on the Microchip ATmega328P microcontroller.A variety of expansion boards (shields) and other circuitry can be interfaced with the board's groups of digital and analog input/output (I/O) pins.The board has 6 analog I/O pins, 6 digital I/O pins, and 14 digital I/O pins, six of which can be used for PWM output. It can be programmed using the Arduino IDE (Integrated Development Environment) using a type B USB connection. A barrel connection that can take voltages between 7 and 20 volts, such as a square 9-volt battery, or a USB cord are both options for powering it. It resembles the Arduino Nano and Leonardo in some ways.The hardware reference design is made accessible on the Arduino website and is released under a Creative Commons Attribution Share-Alike 2.5 agreement. There are also layout and manufacturing files accessible for some hardware variants. The Italian term "uno," which means "one," was selected to signify a significant redesign of the Arduino hardware and software. The Uno board was the successor of the Duemilanove release and was the 9th iteration in a line of USB-based Arduino boards. The Arduino IDE for the Arduino Uno device has since developed to later versions from version 1.0.[4] The bootloader that comes pre-installed on the board's ATmega328 enables for the transfer of new code without the need for an external hardware driver.

IR SENSOR:

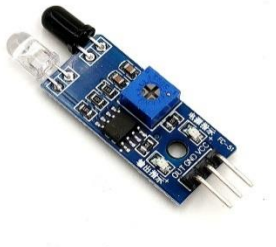

Fig3:IRsensor

A device that responds to infrared (IR) light is known as an infrared detector. Thermal and photonic monitors are the two primary kinds. (photodetectors).

Numerous temperature-dependent events allow us to track the thermal impacts of the incident IR radiation. Changes in impedance are the basis for bolometers and microbolometers. The thermoelectric effect is used by thermocouples and thermopiles. Thermal growth is followed by Golay cells. The most common type of monitor used in IR spectrometers is the pyroelectric one.

RELAY Module

Fig4:relay module

An electronically controlled switch is a circuit. It is made up of a set of working contact terminals and a set of input terminals for one or more control impulses. Any number of contacts in different contact configurations, such as make contacts, break contacts, or mixtures of both, may be present on the switch.Relays are used when multiple circuits need to be controlled by a single signal or when a circuit needs to be controlled by a separate, low-power signal. In order to refresh the information flowing in from one circuit by transmitting it on another circuit, relays were first used in long-distance telegraph circuits. To carry out logical processes, relays were widely used in early computers and telephone lines.

Solar Charger Controller:

*Fig5:*solar charger controller

To prevent electrical excess, overcharging, and possibly overvoltage, a charge controller, charge regulator, or battery regulator restricts the rate at which electric current is added to or taken from electric batteries.[1] This avoids circumstances that could endanger battery safety and lower battery performance or lifetime. Depending on the battery technology, it may also conduct regulated discharges or keep a battery from being fully drained ("deep discharging") to preserve battery life.In addition to control circuits built into a battery pack, battery-powered device, or battery charger, the words "charge controller" and "charge regulator" can also apply to standalone devices.[4]

Solar panels:

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Fig6:solar panels

A solar cell panel, solar electric panel, or solar panel is an assemblage of photovoltaic solar cells placed in a (typically rectangular) frame. It is also referred to as a photovoltaic (PV) module or PV panel. Sunlight is used by solar cells to collect radiant energy, which is then transformed into direct current (DC) power.

A photovoltaic system, also known as a solar array, is a well-organized group of solar cells. A photovoltaic system's arrays can be used to produce solar power that either directly powers electrical devices or, through the use of an inverter system, is fed back into the alternate current (AC) infrastructure.

LCDDISPLAY:

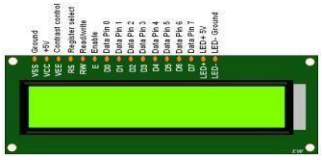

Fig8:LCDDisplay

The term LCD stands for liquid crystal display. Itis one kind of electronic display module used in anextensiverangeofapplicationslikevariouscir cuits&deviceslike26mobilephones,calculators ,computers,TVsets,etc.

Battery:

Figure8:Battery

A rechargeable battery used to power an automobile is known as a vehicular battery or car battery. Its primary function is to supply an electric current to the electric starting motor, which in turn ignites the internal combustion engine that powers the vehicle's propulsion system. The battery continues to power the car's electrical components even after the motor has started, and as demand rises and falls, the alternator charges the battery.

1.2. WORKINGPROCEDURE:

In the beginning, we were using currency receptacles. However, they had a socket connection in those currency receptacles. Similar to that, we power our mobile phones in the same way. The solar charge controller is attached to the solar cells, which are then connected to the relay module, which serves as a switch. Inserting the software code and the exterior parts connects the switch module to the Arduino board. The IR sensors in the exterior components are what we use to identify currencies like the 1 rupee, 2 rupee, and 5 rupee pieces. The charging state, whether it is charging or not, can be seen on the LCD. if the phone has an LCD charger.

2.RESULTS:

2.1. CIRCUITCONNECTION:

Fig10:CircuitConnection

This is Our Final Circuit Connection. The coin based mobile charging by using the solar panels.

CONCLUSION&FUTURESCOPE:

A solar-powered recharge device for portable batteries from various manufacturers is suggested. The method is suggested for rural and remote locations where the current source is not always or sufficiently accessible. In areas where there is a power problem, this initiative is very helpful.

Due to the importance of contact today, one of the issues users encounter is mobile phone charging. The suggested method will offer a way to charge a mobile phone in an emergency without access to an electrical outlet.

Ainnovative method of charging mobile devices, coin-based mobile charging will only become more and more common in the future. This charging technique is likely to become the preferred option for those seeking to save money and lessen their environmental impact as more people become conscious of its advantages. Additionally, it is possible that coin-based mobile charging will become even more effective and economical as technology develops. Users may now have new options, such as the

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capacity to refuel their gadgets in far-off places or even space. The possibility for coin-based mobile charging is endless and has a promising future.

REFERENCES:

[1] M.S.Varadarajan,"Coin Based Universal Mobile Battery Charger",IOSR Journal of Engineering (IOSRJEN), Volume 2, Pp 1433-1438,2012.

[2] S.B.Sridevi, K. Nalini, A. Sai Suneel "Coin based mobile charger using Solar tracking system"International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE), Volume 2, Pp.741-745, 2013.

[3] M.Pastre, François Krummenacher, OnurKazanc, NaserKhosro Pour, Catherine Pace, Stefan Rigert, and Maher Kayal"A Solar Battery Charger with Maximum Power Point Tracking", in Proc. IEEE Electronics,Circuit& Systems(ICECS)2011,Pp.394-397.

[4] ChengliuLi ,WenyanJia , Quan Tao ,MinguiSun,"Solar Cell Phone Charger Performance in Indoor Environment," in Proc.IEEEBioengineering Conference (NEBEC), 2011,Pp 1-2.

[5] Henry Shu-Hung Chung , K. K. Tse , S. Y. Ron Hui , C. M. Mok , M. T. Ho ,"A Novel Maximum Power Point Tracking Technique for Solar Panels Using a SEPIC or Cuk Converter," in Proc. IEEE TRANSACTIONS ON POWER ELECTRONICS, 2003,Pp. 717-724.

[6] Cesare Alippi, Cristian Galperti, "An Adaptive System for Optimal Solar Energy Harvesting in Wireless Sensor Network Nodes," in Proc.IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—I, 2008, Pp.1742-1750.

[7] S. BanuPrathap, R. Priyanka ,G. Guna, Dr. Sujatha,"Coin based cell phone charger," International Journal of Engineering Research &Technology, Pp 1-4, 2013.

[8] SakshiSharma, Ana Monga, "Implementation of Reverse Vending Machine based on FPGA," International Journal Emerging Technologies in Computational & Applied Science, Pp 265-271, 2013.

[9] P.Pradipa,K.Suganthi,N.Suganthi,M.Menagadevi , T. Sudhalavanya,"Design & implementation of Vending Machine using VerilogHDL," International Journal of Advanced Engineering Technology,Pp 51-53, 2013.

[10] S.Sukhkumar, G. Rajkumar, T. Devika,"A Novel approach of Automation in ticket vending machine using ARM processor," International Journal of Engineering Trends &Technologies,Vol 8,Pp257-261, 2014.

[11] Suchika Malik, Parveen Bajaj, MukhwinderKaur,"Sample Coin Recoginition System using Artificial Neural Network on Static Image Database," International Journal of Advanced Research in Computer Science & Software Emerging,Pp.762-770, 2014.

[12] Kenneth J. AYALA,Version: Second Edition, The 8051 Microcontroller and Embedded Systems Using Assembly and C, 2005.

[13] T.Gunawan, Mirakartivi, Rashidahabubahakar, "Development of portable charger for mobile phone using Arduino micro controller during disaster recovery," in proc.IEEE Advanced Computer Science Applications and Technologies (ACSAT), 2013, Pp 218 - 222.

[14] Sihua Wen, "Cell balancing buys extra run time & battery life," Analog application Journal, Pp 14-18, 2009