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MOBILE CHARGING ON COIN INSERTION

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Abstract: We all know that mobile phones play an important part of our day to day lives. May it be to connect with someone or to entertain ourselves, to make an online payment or to get the latest news updates, mobile phones supports a number of features. However, this phones require regular charging. Hence, it is important that there are adequate power supplies available around us to feed the phones so that one can charge their phones especially during the time of emergency. This paper describes the charging of phone using coin sensing for the means of public utility. Many times, when we are outdoors and our phone battery dies off in the middle of the conversation and access to a standard charger is not possible, this is when we can make use of this charger.

Introduction

In developing nations, power supply is not available 24*7, especially in the rural areas. The semi-urban and rural areas suffer multiple power cuts where mobile phones are essential communication devices[1]. Having noted the fact of unpredictable power supply and abundant solar energy, this project is designed. It is based on coin detecting mechanism[1]. The main aim of this project is to provide solutions for charging of phones at public places using coin sensors. The person who wants to charge his or her phone simply needs to plug into the socket and insert a coin into the coin sensor which would detect the coin if it is valid or not. If the coin is valid, the sensor will send a pulse to the microcontroller. The microcontroller will then turn on the relay to provide 230V,50Hz signal to the charging socket and the user can charge his/her device for a certain duration depending upon the coin inserted. The coin sensor is fully programmable so you are not limited to any currency. For each unique coin, different charging time is set. The coins are calibrated beforehand using the coin sensor. The diameter, thickness and fall time of the coin is taken into consideration for the calibration. After you've programmed , the coin profile simply reads the serial output of the coin sensor and it tells the value of each coins they are inserted .It reports these values as binary bytes and baud rate is selectable on the unit.[1][2]

Description of components:

Arduino Uno: The **Arduino Uno** is a microcontroller board based on the ATmega328. It has 20 digital input/output pins (of which 6 can be **used** as PWM outputs and 6 can be **used** as analog inputs), a 16 MHz resonator, a USB connection, a power jack, an in-circuit system programming (ICSP) header, and a reset button [3].

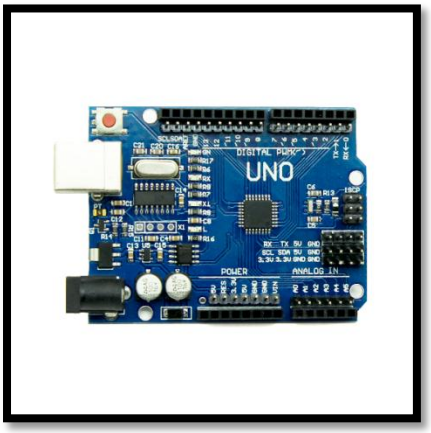

Fig. 1 Arduino Uno

Relay: A **relay** is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations there of.

LCD Display: A liquid-crystal display is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizer. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome.[4]

Coin Sensor: The **coin** acceptor identifies the **coin** according to its mass, size, diameter, thickness, metal composition and/or magnetism, and then sends an appropriate electrical signal via its output connection. The next step is generally performed by the banknote-to-**coins** exchanger. [5]

fig 4:coin sensor

Battery: A **battery** is a device consisting of one or more electrochemical cells with external connections for powering electrical devices such as flashlights, mobile phones etc.

Solar Panel: Solar power is the conversion of energy from sunlight into electricity, either directly using photovoltaic, indirectly using concentrated solar power, or a combination. Concentrated solar power systems use lenses or mirrors and solar tracking systems to focus a large area of sunlight into a small beam.[6][7]

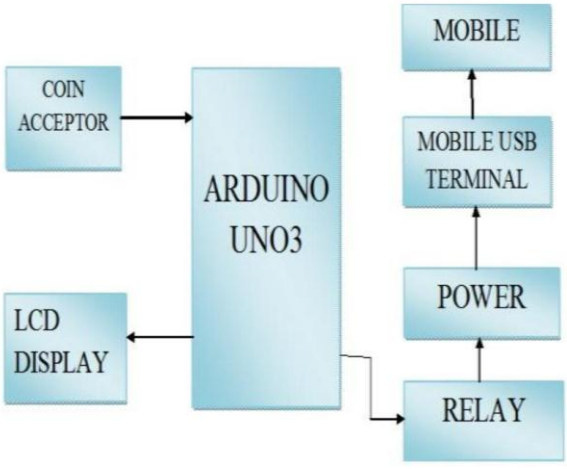

Fig. 8. Block Diagram of Proposed Model. [8]

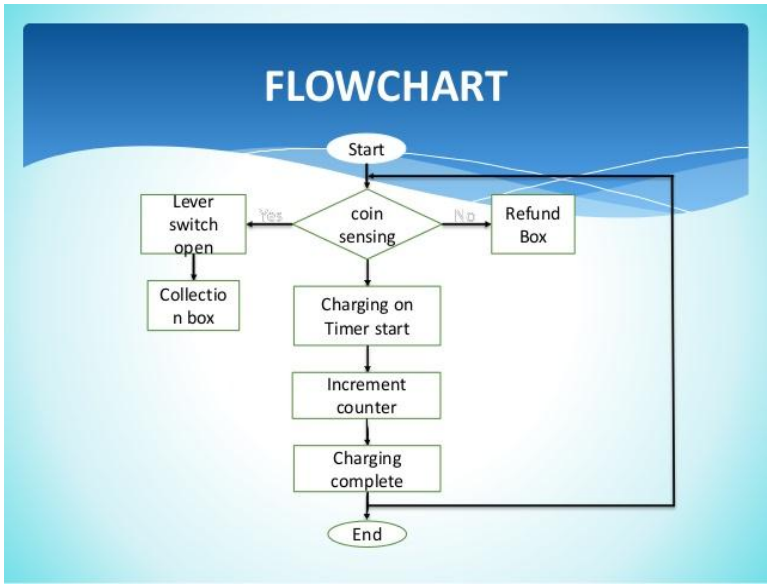

Fig. 9: Flowchart of the proposed model [9]

Working of the proposed Model:

When we insert any pre-calibrated coin in the coin sensor, it generates certain set of frequencies based on certain parameters of coin like thickness, diameter, fall time. Microcontroller (arduino UNO), based on input signal provided by the coin sensor, activates the relay for certain period of time.USB port gets activated as soon as relay activates and thus, One can charge his/her gadget by using a USB cable. Different Charging intervals can be allotted to the calibrated coins.

Power source for gadget charging is a 12V battery which is connected with Solar panels as well as with a 230V AC adapter.

Advantages[10]

-Cost effective

-Good level of security against at a very competitive price.

-Advanced models allow for multi-coin validation

-Field programmable

-Installed at public places like malls, bus stands, airports, railway stations to help people charge their phones.

Proposed Future Modification:

Due to increasing demand of Electric Vehicles, this model can further be used to provide affordable and self serviceable charging Stations across the highways.GSM and GPS module , if used, can provide exact location of the charging stations at the mobile phone of the Vehicle owners.[10]

Conclusion

In this project we have designed a charger which can be installed in public places or rural areas to help people charge their mobile phones especially during the time of emergency. It is cost effective and secure. It will minimize carrying of power banks everywhere we go , if installed at places where standard charging conditions are not available.

Acknowledgement

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