MOBILE CHARGING SYSTEM USING COIN AND RFID

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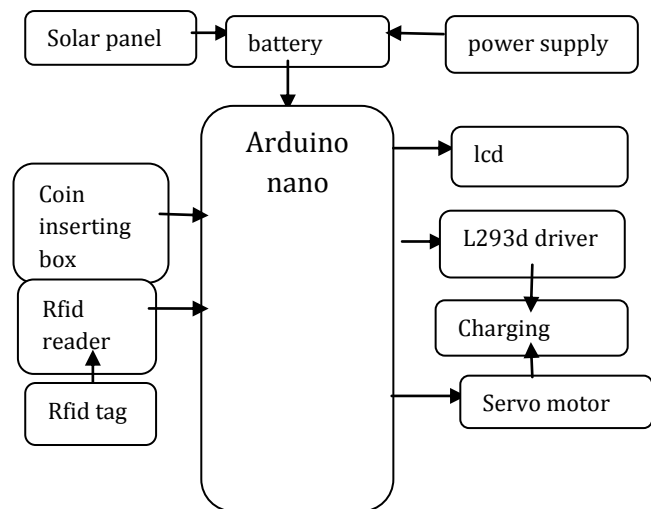
Abstract - This document describes coin and RFID-based mobile chargers that use solar system for maintenance in public areas. In rural areas, grid power is partially available in one day. Solar charging is a good way to overcome this. This technique can be used at train stations, bus stops, and markets. The basic design of this system is to provide users with uninterrupted communication if the user forgets to charge the battery or if the battery runs out. You can insert coins, Rs 1 coins, Rs 2 coins, Rs 5 coins and use the RFID reader to charge your mobile phone. Arduino NANO is used to detect the inserted coin and RFID with a laser and control the charging time for a certain period of time that the user can continue by inserting more coins. With the Arduino software installed on your computer, you can edit and upload programs to suit your application.

*Keyword*s: Arduino Nano, solar panel, mobile phone

1.INTRODUCTION

This work aims to design a mobile charging system using coins and RFID. Today, the mobile industry is growing rapidly and technology is changing every year. There is a growing need for mobile phones for communication and bill payments. This system is used to charge in an emergency or when the batteries and are emptied without being connected to the mains. Urban people have enough grid power and alternatives to charge their cell phones, while rural people experience power outages and the cell phone's battery drains easily. This system works with both solar and grid power. This system works in two ways: insert a coin or register with an RFID tag. First, open the RFID tag to be registered. Users want to connect their phones and scan RFID tags. After registration, the door will close and the phone will start charging. Another possibility for an unregistered user to insert a coin and charge the mobile phone depends on the coin to be inserted, and the charging time of the mobile phone will be different.

1.1 METHODOLOGY

As shown in the above fig for charging mobile we have both sources solar panel and also grid power. In this system, mobile charging is done using two methods. One is using RFID and the other is using the coins. For registered RFID users has to charge their mobile using RFID tag and for other users who has not registered they has to use coins like 1Rs, 2Rs, and 5Rs. RFID users will get locking system for their mobile for security purpose. Initially the door is opened so that user has to place their mobile inside it and scan the RFID tag if it is unregistered tag then it displays access denied please register on the LCD screen provided otherwise it displays access granted mobile charging. Here servo motor is using for opening and closing door, IR sensors are using to detect the coins and EM-18 RFID Reader module is using to read RFID tag.

2 HARD WARE COMPONENETS

2.1 SOLAR PANEL:

Fig 2.1 Solar panel

Solar panels are used to capture the sun's rays and convert them to power or heat. A solar panel is collection of photovoltaic cells that can be used to generate electricity via the photovoltaic effect.

2.2 LEAD ACID BATTERY:

Fig 2.2 Lead Acid Battery

A lead acid battery is a type of rechargeable battery that uses chemical reactions between lead, water, and sulfuric acid to store electrical energy. Lead acid batteries are a solid option for storing energy generated by a solar array.
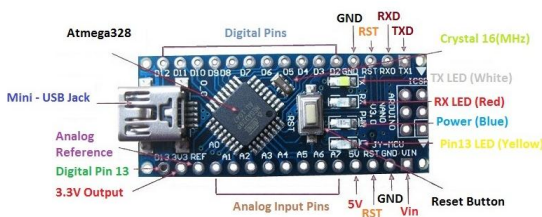
2.3 ARDUINO NANO:

Fig 2.3 Arduino nano

An Arduino Microcontroller has a crystal oscillator with a frequency of 16 MHz. It's required to develop a clock with a precise frequency by employing a continuous voltage source. The Arduino Nano has one drawback: it lacks a DC power connection, which means you can't use it to power an external power source like a battery.

2.4 RFID TAG

Fig 2.4 RFID Tag

RFID Tags are simple devices having a chip and an antenna that can be used to wirelessly identify the objects they are embedded in using an RFID reader. RFID tags, unlike barcodes, do not require line of sight between the tag and the reader and may read and write data.

2.5 RFID READER

Fig 2.5 RFID Reader

An RFID reader is a device that collects data from an RFID tag, which is used to track particular things. Data is transmitted from the tag to the reader using radio waves. RFID (radio frequency identification) is a technology that works similarly to bar codes in theory.

2.6 LCD DISPLAY

Fig 2.6 LCD Display

LCD (Liquid Crystal Display) is a type of flat panel display that uses liquid crystal in its main mode of operation. LEDs have a variety of consumer and business use cases, as are often found in smartphones, televisions, computer monitors and instrument panels

2.7 IR SENSORS

Fig 2.7 IR Sensors

An infrared sensor (IR sensor) is a radiation-sensitive optoelectronic component with spectral sensitivity in the infrared wavelength range of 780 nm...50 um. IR sensors are widely used in motion detectors today

2.8 SERVO MOTOR

Fig 2.8 Servo motor

The length of the pulse applied to the control PIN of the servo motor controls the angle of rotation. Servo motors are DC motors with variable resistors (potentiometers) and gearboxes. The main advantage of using servos is that they provide angular accuracy. That is, it only rotates as much as it needs before stopping and waiting for the next input. Servomotors are linear or rotary actuators that can accurately control linear or angular position, acceleration, and velocity. It consists of a motor with a position feedback sensor. You also need to use advanced controls.

2.9 L293d DRIVER

Fig 2.9 L293D Driver

The L293D is a 16-pin IC with 8 pins on both sides dedicated to motor control. Each motor has two INPUT pins, two OUTPUT pins, and one ENABLE pin. It receives signals from the Arduino and sends it to motor.

3 FUTURE SCOPE

The tickets bought on the trains and buses in the fast-moving society by this idea the reduction of queues in public places and it also reduces human power.

With some modification of this system we can use the same system for safe keeping of luggage in shopping malls instead of allotting security personnel to guard the luggage. In colleges this system can be used for keeping mobile phones of students during examinations and also some industrial applications.

4 CONCLUSION

A system for charging mobile batteries of different manufacturer using solar power is proposed. The system is proposed for rural and remote areas where the current supply is not available all the time or for sufficient time. This project is very useful at such locations where people are facing power crisis. Since, necessity of communication is very important now days, cell phone charging is one of the problem faced by users. The proposed system shall provide a source of charging the cell phone in emergency conditions without the electric supply

RESULTS

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