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Coin Based Mobile Charger using Solar System

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Abstract:
This paper describes coin based mobile charger using solar system which provides service in public areas. In rural areas partial grid power is available in a day, to overcome this solar charging is a suitable method. This technique can be used in railway stations, in bus stands, in market. The basic design of this system is to provide uninterrupted communication to the user if he forgets to charge his battery or if the battery becomes flat. Charging of mobile can be accomplished by single coin insertion of 10RS coin. Arduino UNO is used for detection of inserted coin using laser and controlling charging period for specific time user can continue the charging inserting more coin. Arduino software is installed in the computer and so that we can edit and upload the program according to the application. This arduino software supports C & C++ programming language.

Keywords: Arduino, Coin Detection (Laser), Solar Panel, LCD, USB, Relay

I. INTRODUCTION

The mobile phone market is a vast industry and has spread into rural areas as an essential means of communication. While the urban populations use more sophisticated mobiles with good power batteries lasting for several days, the rural population buys the pre owned mobile phones that require charging frequently [1]. This technique can be used in business areas, in railway station, in bus stand, in market. The basic designed of this system is to provide uninterrupted communication to the user if he forgets to charge his battery or if the battery becomes flat [2]. Once we connect the mobile to charging slot we require to put the coins in the system after inserting coin it will compare with the database and if the coin insertion is exact then mobile will charged. This charging system is depend on the solar using solar panel the sun energy is converted into electrons(current).we know much of sun energy is wasted on earth and we need to use that energy. That's why in the system use the solar energy [3]. In our project "Coin Based Mobile Charger Using Solar System" there is solar energy and coin insertion here coin will be detected through laser. We use 10rs. Coin for 15 min of charging. Programming of Arduino is done in Arduino IDE which is open source software.

Figure.1. ARDUINO

II. LITERATURE & SURVEY

Literature [1] represents coin based solar mobile charger. In this paper arduino uno R3 is used to control LCD display unit, relay automation, coin insertion unit and charging unit. To make use of maximum amount of solar energy, solar tracking unit is added to the solar panel. Programming of Arduino is done in Arduino IDE which is open source software. The specification included like solar panel of 30watt and 12 volts power supply. And stepper motor of 12-24 volts is used .practically battery charges in about 2 to 5 hrs. While ideal time is 1 hrs. Battery is consumed within 7 to 8 hrs whereas ideally, it is to be consumed in 11hrs. Literature [2] Designed based on ATMEL 89c51 a 40- pin micro controller that does the countdown timings for a period of 3 minutes with LCD displays showing the actual time left. During the timing period a really output is latched and finishing timing in progress. The charging current is up to 4.5AH @ 6vDC and this takes care of the mobiles manufactured by Nokia, sony, blackberry, HTC and others first and second generations mobiles. Literature [3] Presents coin detection using MATLAB so that duplication of coin is avoided. Web-cam; which is used for coin detection using image processing and also microcontroller; ARM7-LPC2131/32/34/36/38 family is used. The keil u version used. Literature [4] Describes microcontroller is used for detection of inserted coin using IR sensor and controlling the charging period for specific time. User can continue the charging by inserting more coin. The mechanical movement of the solar panel is controlled through the stepper motor. 2 LDR's used. So according to the sun movement LDR intensity will be varied, where the sun intensity is more LDR intensity will be less and depending upon LDR intensities stepper motor will be roted to the side where the LDR intensity is found to be less so that solar panel is also rotates. Here panel of 18v is used to gives the output of 1.2mA. Solar Literature [5] presents solar panel universal mobile charger using the solar energy at the place of external power supply. When the customer inserts a coin in this device then the mobile charging will be start for 10minute. The solar power is used for mobile battery charging. The charging current is required up to 2.5AH @ 3.5VDC. The pic

microcontroller is used. Only one rupees coin is inserted. Battery is used for power supply.

III. BLOCK DIAGRAM

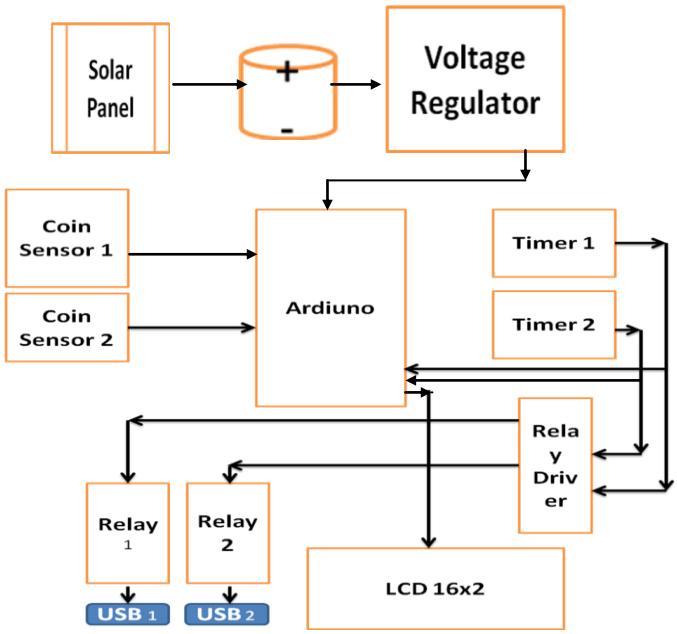

Figure.2. Block diagram

Above block diagram shows the coin based mobile charger using solar system

SOLAR PANEL-

To provide power supply regularly, we use solar panel. This solar panel absorbed the light from the sun then this will generate the light energy and this solar charger convert light energy into DC current for a range of voltage that can be used for charging the 12v rechargeable battery is applied to the voltage regulator which will given to the pure constant DC voltage, Then this pure constant DC voltage is applied to the Arduino.

INPUT-

When the user insert the 10RS. Coin in the box laser is present to detect the coin and this sensor sent a command to the Arduino.

ARDUINO -

Arduino works only when the signal receives from the coin box. And this arduino is ON 5V supply which comes on the voltage regulator. The arduino give the 1us pulse at each USB and then it applied to the timer which gives coin. The arduino which is connected to the LCD will display message, if coin is correct detected then it will accept Otherwise, It will goes to refund box.

OUTPUT-

When the pulse will triggered then it will applied to the relay driver. This relay driver output is directly applied to the USB and USB gives the charging at a particular mobile.

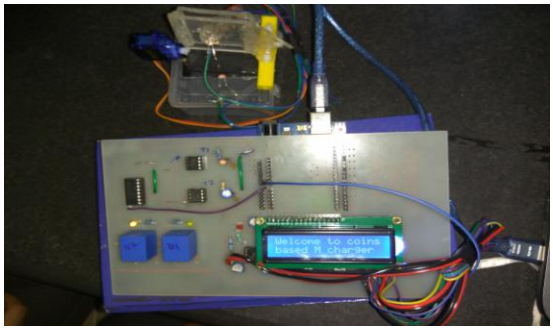

Figure.3. output

IV. APPLICATIONS

- Proposed system will be more effective on Railway Station, Bus Stops, Toll Nakas, and Metro Stations.
- It could be implemented on every square.
- It must be in villages which are without electricity power supply.
- Industrial application.

V. ADVANTAGES

- It will take easier to get mobile charged remote sensing, rural areas.
- No electric power supply needed.
- The coin based mobile battery charger can be easily and installed outside any Business premises.
- Simple and portable.
- Low power consumption.

VI. REFERENCE

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