MOBILE CHARGING BASED ON COIN INSERTION

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Abstract: Mobile phones are phenomenal in recent years for communication as well as in day-to-day life. Hence, charging the mobile phones has become the greater task. In this paper; we are trying to design a mobile battery charger on coin insertion. As uses of mobile phones are increasing day by day it need battery life all the time, so in order to use them public charging is needed which would be useful for mobile users. This system will charge the mobile phone for a particular time-period. When the valid coin is recognized, it will start giving power supply to the cell phone through one of the adapters. We will be using a global charging adapter that would be suitable for all mobile phones. The mentioned system can be implemented in public places like railway stations, bus stops, hospitals, malls, etc. to avail the services.

Keywords: **Mobile Phone, Arduino UNO, Coin acceptor, LCD display, SMPS, Relay**

1. INTRODUCTION:

Now a day's mobile phones are become ineluctable part. Power supply is integral part of all electronic systems. Most of the works are done through mobile phones on daily basis, so charging is the basic requirement to operate them. Therefore, the basic idea considered here is to develop a system that will provide charging on coin insertion. The important thing is the above system will be available at public places to be useful at any time. We will be using electricity for power supply as it is all time available source. The user has to insert the coin into coin acceptor and plug the suitable adapter to the mobile phone. The amount of charging will be pre-defined values as mentioned in the microcontroller. This system is easy to install and useful for the long distance travelling peoples.

2. LITERATURE SURVEY:

The main aim of this research is to provide charger that is determined form solar power and current supply. The system works according to coding written in 89c51 microcontroller IC. The system uses the maximum solar energy for charging mobile battery. The microcontroller activates the driver for particular time as per coin inserted and it consists of transistors that act as a switch to turn ON and OFF MOSFET. The MOSFET output is connected to the charging circuit that will provide charging. [1] The IR (infrared) transmitter and IR receiver is used to transmit and receive the IR signal in the receiver side. Between the IR transmitter and receiver, a coin is to be inserted to change the polarity of pulse in input. The relay will ON to activate the 230v charger, we will use charger to charge for our mobile phone. When the coin is detected it sends a pulse to the 555 timer which turn ON the relay (Electromechanical switch) will start providing charging to the socket to charge the mobile phone. [2] This research is providing unique service to the rural public where the grid power is not available Partial/full daytime. The salient feature of this paper is that it draws power from grid power. In case of non-availability of grid power, it will use the solar energy during the day time for charging the internal battery of the controller. User simply has to plug the mobile phone into one of the adapter and inset the coin; the phone will then be given a micro-pulse for charging. The charging capacity of mobile will be pre-defined values. [3] This research paper is designed based on ATMEL 89c51 a 40-pin microcontroller which support 5 volts only that does the countdown with LCD displays showing the actual time left. AC voltage is converted in to DC voltage by using rectifier. Then fixed DC voltage is regulated by using voltage regulator. During the timing period a relay output is latched and finishing timing in progress. It is of course possible to continue charging by inserting more coins. [4] In the event of unpredictable current supply and availability of abundant solar power, this project is designed with coin detecting mechanism, microcontroller, and real time clock, driver circuit with MOSFET, charging circuit, inverter, cycle converter and different phone socket. This coin based charger is similar like a VENDING MACHINE for charging the cell phone. A sensor attached to the coin insertion slot accepts the coin into the battery charging unit and start charging the mobile battery for a specific period controlled by the software of the microcontroller. The sensor is an IR sensor. [5]

3. PROBLEM IDENTIFIED:

In today's world, mobile phones are considered as the important part of life. People tend to use its huge features, which consumes charging. Peoples who use to make every long journey may require charging anywhere and if they forget to bring chargers then that would create a problem.

Similarly, in many developing areas where grid power is not available for few hours to several hours on regular basis, people may require electricity to charge their mobile phones to continue with their works. So in order to overcome all these problems Mobile Charging Based on Coin Insertion is designed. It would provide reliable charging services with less cost. This system is very helpful an easy to developed.

4. PROPOSED WORK:

The system uses a coin acceptor machine which will detect for a valid coin. The coin acceptor is connected to Arduino board and it then connected to the LCD display. If a valid coin found it signals the Arduino and the Arduino will send signal to LDC to display the amount of time to be charged. The relay will control the power supply to charger, after completion of time duration it will stop supplying power. The SMPS (Switch Mode Power Supply) in the charger used for managing energy conversion. The LCD screen will show how much time left for the charging if the user wants to increase the duration of charging he needs to add another coin then the microcontroller adds the time in currently remaining time.

5. MODULES:

- Input stage-To recognize and accept the valid coins
- Controller-To control the voltage supplied
- Power-To supply the power based on the requirements
- Output stage-To display the output information on screen

6. BLOCK DIAGRAM:

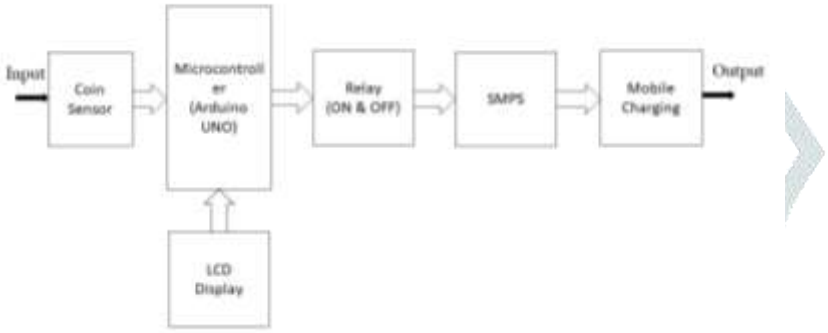

Fig 1: Block Diagram of coin based mobile charging system

7. MAIN COMPONENTS:

7.1 Coin Acceptor:

The coin acceptor device accepts the coin through coin insertion slot. The sensor inside the coin acceptor device will recognize and validate the coin based on the coin diameter. When the inserted coin is validated, it sends signal to the Arduino for power-supply otherwise the coin will be returned back.

Fig 2: Coin Acceptor

7.2 LCD:

LCD is Liquid Crystal Display. Initially it will display 'please insert a coin'. When the coin is validated, it displays the timing of charging and when coin is not validated it displays a 'rejected' message. LCD is attached to Arduino UNO and gets the status of the systems to display on the screen.

Fig 3: LCD Display

7.3 Relay:

Relay is a switch that open and close circuits electromechanically. Relay control one electrical circuit by opening and closing contacts in another circuit. When the relay circuit detects the undesirable condition with an assigned area and gives the command to the circuit breaker to disconnect the affected area. Thus protects the system form damage.

Fig 4: Relay Board

7.4 Arduino UNO:

Arduino is an open source electronics platform. It is easy to use hardware and software device. Arduino Uno is a microcontroller board that contains everything needed to support the microcontroller. Arduino does not need a separate piece of hardware in order to load new code onto board, instead it uses a USB cable. Arduino board is able to read inputs-light on a sensor, a finger on a button, turning on the LED etc. It has 14 digital input and output pins.

Fig 5: Arduino UNO Board

7.5 SMPS (Switch Mode Power Supply):

SMPS is an efficient and effective source of power. It is a device in which energy conversion and regulation is provided by power semiconductors that are continuously switching “on” and “off” with high frequency. The switching regulator does the regulation in the SMPS. It turns the current supply to a smoothing capacitor on and off. SMPS dissipates very less energy as heat.

Fig 6: SMPS Circuit

8. CONCLUSION:

Our paper describes the new way of providing charging services to the public. It would be of less cost because conventional grid power is used and beneficial to the long distance travelers. This coin based mobile charging system can be installed at various public places for the convenience of mobile users. The objective of this paper is to help mobile users by providing coin based charging that would be easily available whenever they need it.

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