Implementation of Solar Panel Based Multi Mobile Charger with Auto Cut Off of Power

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Abstract: The paper explain Coin Based Mobile Charger Using Solar Tracking System .As whole world is going towards the new phase of technology our needs becomes more sophisticated, on the other hand we need speed, quality, and effectiveness . But battery life of a smart phone will never match that of an old phones, so it is the high on everyone priorities which smart phone should buy? Sometimes battery becomes flat in the middle of conversation particularly at in convenient times when access to a standard charger isn't possible. It is true that many consumers carry around chargers with them or can find them in an Airport terminal or even a retailer, but this requires a consumer on the go to tether themselves to an outlet while waiting for the charge to fill. There are also charging cases and back-up battery products, but these too are mere band aids to the issue at hand. So to operate these mobile phones public charging is needed, and it should be useful to public. This system that is solar mobile charger gives the charging to mobile phone and solve this problem. This system is like coin based phones which was famous in beginning of 20th century. This System is designed based on ATMega16 a 40 pin micro controller that count down timing for a particular time period which was predefine with LCD display showing the processes. The relay and LDR output is latched and finishing timing in progress

Keywords: Battery, Solar tracking system, LDR, ATMega16..

I.   INTRODUCTION

In the present day scenario power has become the major need for human life. Energy is an important input in all the sectors of any countries economy. The day-to-day increasing population and decreasing conventional sources for power generation, provides a need to think on non-conventional energy resources. Here in this paper we are looking forward to conserve the solar energy that gone wasted. With the growing speed of technology advancement, smart phone have become the essential component of daily life. Smartphone is mobile phone which offers advance technologies with functionality similar as a personal computer. There are also very advanced features in smart phone such as internet, instant messenger and email etc. As whole world is going towards the new phase of technology our needs becomes more sophisticated, on the other hand we need speed, quality, and effectiveness . On the other hand these feature should be combined in a solution small enough to carry it in the pocket. But battery life of a smart phone will never match that of an old phones, so it is the high on everyone priorities which smart phone should buy? It is true that many consumers carry around chargers with them or can find them in an Airport terminal or even a retailer, but this require a consumer on the go to tether themselves to an outlet while waiting for the charge to fill. There are also charging cases and back-up battery products, but these too are mere band aids to the issue at hand. So to operate these mobile phones public charging is needed, and it should be useful to public. This system that is coin based solar mobile charger give the charging to mobile phone. Sometimes battery becomes flat in the middle of conversation particularly at in convenient times when access to a standard charger isn't possible. The coin -based solar mobile battery chargers are designed to solve this problem. This system is like coin based phones which was famous in beginning of 20th century. Initially when we inserted the coin into coin insertion slot, it will detect that coin with the help of sensor. Then we can connect our mobile to the charging plug and charging will start. Charging is depend on the coin

II.   LITERATURE REVIEW

[1]   Raju R. Khawse, Sachin S. Shikare , Pradip Suryawanshi, Prof. A. A. Trikolikar- International Journal of Advanced Research in Computer Engineering &Technology (IJARCET) Volume 4 Issue 3, March 2015 Mobile phones play's an important role inpresent communication world as well as day to day life. This paper describes mobile charger using solar panel systembased on coin and RFID module. The mobile phone business is currently worth billions of Dollars supports ofmost no. of features in your mobile phone with several OS.There are increasing large numbers of Android user whichrequires more battery supply. So to operate these mobilephones public charging needed & it should be useful topublic. This design is based on AVR ATMEGA16, a 40 pinmicrocontroller with LCD displays showing the actual timeleft. During the time period, a relay output is latched. Thiscan be used at Hotels, Conference centers, Exhibition halls,service offices, Shopping malls, Airports, Train terminals.So that the mobile phone users can reactivate a low battery or dead battery by simply plug in & charging for one rupee.

[2]   Gunjan Chhabra, Sunil Kumar and Pankaj Badoni -1st International Conference on Next Generation Computing Technologies (NGCT-2015) Dehradun, India, 4-5 September 2015. In this communication era, mobile - telephone industry has grown profoundly. The urban population uses the latest mobile-phone technology while the rural population buys second hand ones, mostly with degraded battery, that require frequent charging. This battery-problem becomes a giant when user doesnt have a standard charger or an electricity connection. In this paper, researchers intent is to propose a public coin based mobile battery charging system. By using image processing techniques, value of the coin has been detected for a limited time; it will charge the device accordingly. A suitable microcontroller is programmed for all the controlling applications. The source for charging is obtained either from a direct power grid or by solar energy.

[3]   S.B.Sridevi, A.Sai Suneel, K.Nalini- International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) Volume 2, Issue 9, September 2013 This paper describes coin based mobile charger using solar tracking system. Mobile phone's become a major source of business/personal communication; the mobile phone business is currently worth billions of dollars, and supports millions of phones. The need to provide a public charging service is essential. Many critics argued that a public mobile phone charging service is not a lucrative business because most users can charge their phones at home, in their office or in their cars. Coin operated mobile phone charger is new business milestone because many are attending business conventions and forgetting their chargerat home or in hotel rooms. Students and many people use the public transportation that don't know that their level of their battery is low are prospective customers for coin operated mobile phone charger service. Recommended locations include: Hotels, Conference centres, Exhibition halls, Serviced offices, Exchange halls, Motels, Leisure centres, Health clubs, Training centres, Golf clubs, Retail outlets, Shopping malls, Internet cafes, universities, Colleges, Hall of residence, Airports, Train terminals, etc., so that the mobile phone users can reactivate a low or dead battery by simply plugging in and charging for one rupee.This is designed based on ATMEL 89c51 a 40-pin microcontroller that does the countdown timings for a period of 3 minutes with LCD displays showing the actual time left.During the timing period a relay output is latched and finishing timing in progress.

III.   CIRCUIT DIAGRAM
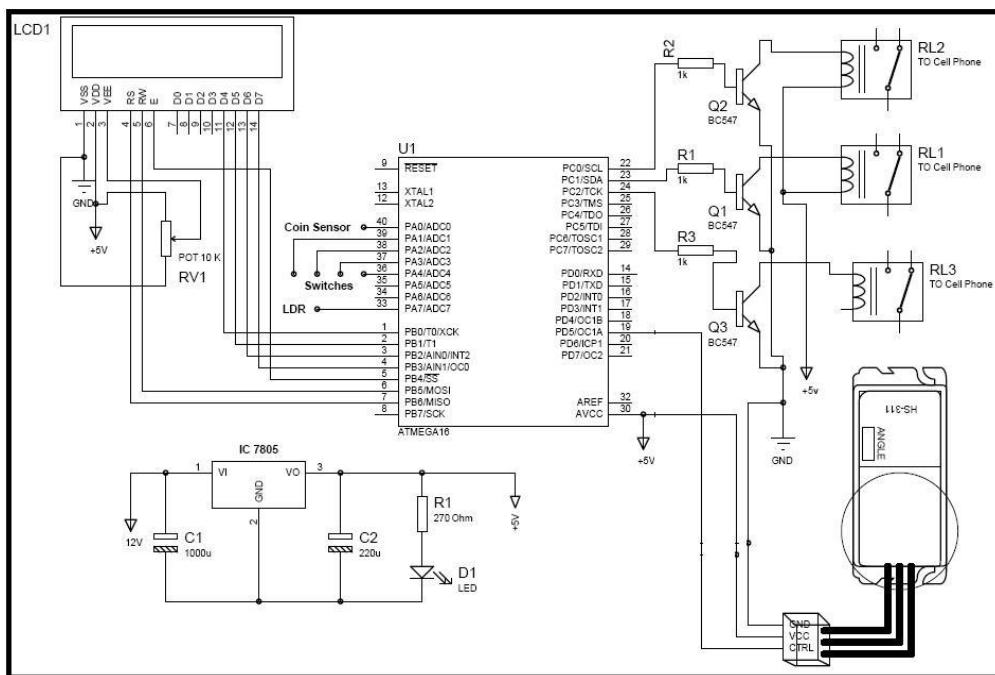
IV.   WORKING

Usually ordinary solar panel is always faces only in one direction because of this reason the solar panel may not get sufficient sun rays to work. In this system solar panel will rotate according to the readings read by the LDR. So it will utilize the full sun light to work & power optimization is also done by using the LDR. This work mainly designed to control the solar panel automatically, maintains face of the solar panel towards the sun. This is done by controlling the mechanical movement of the solar panel. The mechanical movement of the solar controlled through the stepper motor. 3 LDR's will be placed on arch. So according to the sun movement LDR intensity will be varied where the sun light intensity is more LDR intensity will be less and depending upon LDR intensities stepper motor will be rotated to the side where the LDR intensity is found to be less so that solar panel is also rotates. Power optimization is done by using LDR. If the surrounding light is less then LDR reads maximum. According to the value of LDR the ADC shows the reading. The ADC will send this value to microcontroller. According to the value sent by the ADC the microcontroller glows the LED through relay. If the intensity of the light is more means all the LED array will be OFF. Depending upon the intensity of the light LED arrays will be switched ON or OFF. The input to the circuit is applied from the regulated power supply. The AC input i.e., 230V from the mains supply is step down by the transformer to 12V and is fed to a rectifier.

The output obtained from the rectifier is a pulsating DC voltage. So in order to get a pure DC voltage, the output voltage from the rectifier is fed to a filter to remove any AC components present even after rectification. Now, this voltage is given to a voltage regulator to obtain a pure constant DC voltage. The mobile battery charger starts charging a mobile connected to it, when a coin is inserted at the coin insertion slot at the input stage. The type of coin and the size will be displayed at the LCD display for the user, so as to ensure correct coin insertion. Any other coin, if inserted in the slot will be returned to refund box. A mechanical slot is attached with electrical triggering in coin insertion slot, if the correct coin is inserted, it sends a pulse to the control unit authorizing the start of charging the mobile battery connected to the device. Then 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. Microcontroller section acts according to the input signal from the sensor circuit. Coin accepted or rejected is based on the diameter of the coin. This invokes microcontroller along with LCD interface displays the selection of mobile option if particular mobile is selected for charging the corresponding routine is activated and charge the mobile for a particular duration of time .When the routine completes, it indicates charge complete message through LCD display. Similarly the same procedure is followed for charging more than four different mobiles simultaneously. The LCD displays all the information to the customer as and when required. When the mobile battery is connected, it displays" Insert Coin". While charging it displays "Charging" and at the end of charging cycle it displays "Charge completed". For charging continuously the coin has to be inserted when the display shows "Charge Completed" The output has 10 terminals for connecting different types of mobile batteries. The salient feature of the universal mobile battery charger is that it draws power from the solar energy during the day time for charging the internal battery of the controller. Only if additional power is required, then the grid power is used. A solar micro inverter has been designed for supplying 230v, 50Hz so that both grid power and the solar power are connected in parallel with a switch to changeover from one to the other.

V. SOLAR TRACKING SYSTEM

To provide power supply regularly, we use Solar Panel, DC Power Supply, Battery. Solar Panel provide DC power supply which is given to charge the rechargeable battery of 12V and DC power supply which is from Grid supply provides DC 12V to charge the battery. The mechanical movement of the solar controlled through the stepper motor [5]. 2 LDR's will be placed on arch. So according to the sun movement LDR intensity will be varied where the sun light intensity is more LDR intensity will be less and depending upon LDR intensities stepper motor will be rotated to the side where the LDR intensity is found to be less so that solar panel is also rotates. Power optimization is done by using LDR. If the surrounding light is less then LDR reads maximum. According to the value of LDR the ADC shows the reading. The ADC will send this value to microcontroller.

VI. HOW SOLAR PANELS BEHAVE TO DIFFERENT INTENSITIES OF LIGHT.

CONDITIONS	OPEN CIRCUIT VOLTAGE ACROSS THE PANEL
Covered with cardboard	0.263V
Facing the desk	0.468V
Covered with Paper	2.5V
At the window(11am)	14.72V
In the lab	7.62V
At the desk	5.2V
Using a torchlight at distance 15cm	11.22V
At the terrace(2pm)	At the terrace(2pm)

VII. POWER SUPPLY

The input to the circuit is applied from the regulated power supply [6]. The AC input i.e., 230V from the mains supply is step down by the transformer to 12V and is fed to a rectifier. The output obtained from the rectifier is a pulsating DC voltage. So in order to get a pure DC voltage, the output voltage from the rectifier is fed to a filter to remove any AC components present even after rectification. Now, this voltage is given to a

voltage regulator to obtain a pure constant DC voltage.

VIII.   ADVANTAGES

- Simple and hand efficient.
- Affordable for users.
- Reduced man power.
- Low power consumption.
- More than one user can charge their devices.
- Low Maintenance.
- One time investment system

IX.   APPLICATIONS

• It is useful in public Places.
• It can be used to charge any type of mobile phones.
• It can be used in rural areas where grid is not available.
• It can be used to charge the Power Bank

X.   CONCLUSION

After understanding the related articles, literatures and analysis of a few similar projects, the current design strategy was selected. In this project a novel method of charging mobile phones with coin detection as well as smart card has been designed and with the provision of solar tracking and locking system, travelers who need to charge their mobile phones and gadgets any times and anywhere.

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