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ARDUINO BASED SMART PHONE CHARGING CONTROLLER

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ABSTRACT

Almost every mobile phone (either a fancy smartphone or a simple feature phone) user faces an issue connecting your phone to the charging adapter and forgetting that you plugged in the device. Though almost all the modern charge controllers on mobile phones are very advanced and detect when your battery is fully charged and disconnect supply of power to the battery (not completely but a keeps the device in a charging state known as trickle charge).Every battery has a limit to the number of times it can be charged (known as charge cycles).It effect on the lifetime of the battery. Temperature plays an important role. Hence to avoid trickle charge we need this Arduino based Smartphone Charging Controller. The main concept behind the Arduino based Smartphone Charging Controller is very simple. Set the time for which you wish to charge your mobile phone. Once the time is reached, turn off the power supply to the charger. The power to the charger is turned on with the help of a relay and the timer begins.

Keywords: Arduino, Battery.

I. INTRODUCTION

Nowadays Smart phone is having very high advanced technology than a personal computer. In that smart phone we can access mobile banking whatapp, facebook & other social medias. Mobile phone is having Lithium ion batteries & it was the one we can charge very fastly. In mobile by using android OS we can use many apps as Google map, Gmail,etc.,And also the size of the mobile was very small as compared to personal computers. The batteries in the mobile phones are rechargeable that is one of the big advantage as compared to personal computer. Many peoples are connecting their mobiles to charger & forget to remove as it as fully charged. Due to this the battery life cycle gets decreased & temperature of the mobile gets increased. Due to this increased temperature the hardware of the mobile will gets affected & malfunction may happen. In our modern mobiles automatic disconnection of battery supply was possible but even though its in charging condition. To overcome this by using Arduino we can prevent the overcharging of batteries.

OBJECTIVE

The main objective is to avoid trickle charge and prevent the battery from overcharging and increasing the battery's life cycle. The arduino based smart phone charging controller sets the time for which one has to charge the mobile phone once the time is reached to turn off power supply to the charger.

II. COMPONENTS OF MODEL

A. ARDUINO UNO

The Arduino Uno is an open-source micro controller based on Microchip ATmega328P microcontroller and developed by Arduino. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The Arduino Uno is open-source microcontroller board based on Microchip ATmega328P microcontroller and developed by Arduino.cc the board is equipped with sets of digital and analog input/output(I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.

B. LCD DISPLAY

The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly preferred for multi-segment light-emitting diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations

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for displaying custom characters, special and even animations, etc.

C. MOMENTARY SWITCH

Momentary switches are switches which only remain in their on state as long as they're being actuated (pressed, held, magnetized, etc.). Most often momentary switches are best used for intermittent user-input cases; stuff like reset or keypad buttons. Example:A push button switch causes a temporary change in an electrical circuit only while the switch is physically pushed. A spring returns the switch to its original position immediately afterwards.

D. 5V RELAY MODULE

Relay is one kind of electro-mechanical component that functions as a switch. The relay coil is energized by DC so that contact switches can be opened or closed. A single channel 5V relay module generally includes a coil, and two contacts like normally open (NO) and normally closed (NC). This article discusses an overview of the 5V relay module & its working but before going to discuss what the relay module is, first we have to know what the relay is and its pin configuration.

E. CAPACITOR

Capacitors store electric charge. They are used with resistors in timing circuits because it takes time for a capacitor to fill with charge. They are used to smooth varying DC supplies by acting as a reservoir of charge. They are also used in filter circuits because capacitors easily pass AC (changing) signals but they block DC (constant) signals.

F. BREADBOARD

A breadboard is a rectangular plastic board with a bunch of tiny holes in it. These holes let you easily insert electronic components to prototype (meaning to build and test an early version of an electronic circuit, like this one with a battery, switch, resistor, and an LED (light-emitting diode).A breadboard is a platform you can use to build and test electronic circuits, usually without having to do any soldering. Certain parts of the breadboard are wired together so that electricity can flow from component to component in orderly rows. Amateurs and experts alike use them to experiment with circuit ideas, and in some cases, they can be used to build useful devices directly on the breadboard.

G. CHARGING ADAPTER

An adapter is a device that converts attributes of one device or system to those of an otherwise incompatible device or system. Some modify power or signal attributes, while others merely adapt the physical form of one connector to another.

H. SINGLE SOCKET POWER OUTLET BOX

A small metal or plastic junction box may form part of an electrical conduit or thermoplastic sheathed cable (TPS) wiring system in a building. If designed for surface mounting, it is used mostly in ceilings, under floor or concealed behind an access plan-particularly in domestic or commercial buildings.

III. PROPOSED BLOCK DIAGRAM

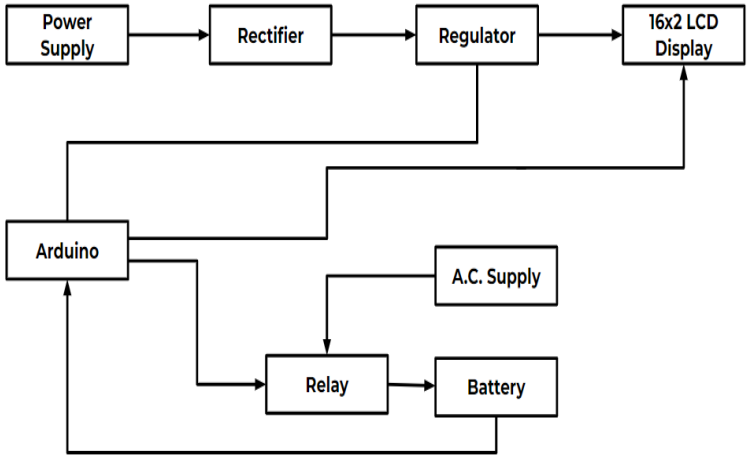

Fig 1: Arduino Based Smart Phone Charging Controller Block Diagram

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IV. ADVANTAGES

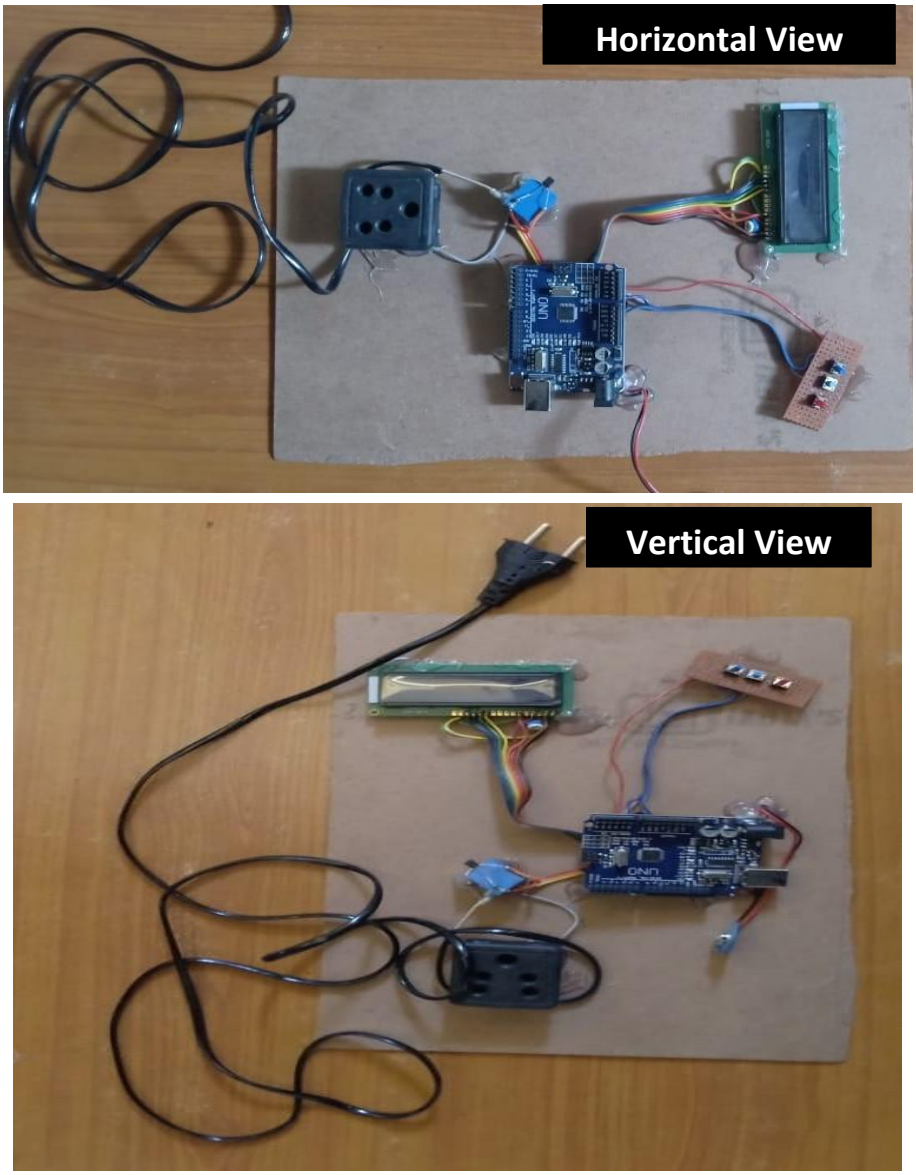
- Improves battery life
- Very useful for people who tend to charge the phone during night time or those who often forget that they plugged in the phone to the charger.
- Easy Integration
- More Reliable & requires less space
- Faster to connect & disconnect
- Multiple devices can be charged simultaneously

V. APPLICATION OF PROPOSED SYSTEM

Smartphone Charging Controller system can be help full to control the charging-time improves battery life of mobile phones & very useful for people who tend to charge the phone during night time or those who often forgot that they plugged in the phone to the charger.

VI. RESULT

Once, the timer completes the input time set from the switch the mobile phone stops getting charged. This results in saving the battery life of the mobile phones.



Project Overview

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VII. FUTURE SCOPE

In future there is a good amount of demand of this type of systems which help in maintaining the battery life of smart phones as by the increased use of these gadgets.

VIII. CONCLUSION

Arduino based Smartphone Charging Controller is implemented here which is a simple project for controlling the amount of time you charge your mobile phone. Using this project, you can plug in your phone to the charger, set the time for which your phone gets charged and forget as the project will automatically disconnect power to the charger. This project is very useful for people who tend to charge the phone during night time or those who often forget that they plugged in the phone to the charger.

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