

WIRELESS MOBILE CHARGER USING INDUCTIVE COUPLING

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ABSTRACT: In this paper to protect the mobile phone, a new concept is implemented with anti-theft alert and the recharging of the mobile phones is done using inductive coupling. Electromagnetic field is required to transfer the energy between the two objects this is done by induction principle. This paper is used to charge mobile phone wireless and this method is used for multiple ways such as securing the mobile from loss or theft. If anyone wants to steal the mobile phone without switching off, automatically a 60 Db siren will get switched ON. The system is connected to a control switch it has to be made ON such as if the user wants to charge mobile it will be placed on this inductive plates. Once the charging is completed do not remove the mobile phone without making the switch OFF automatically siren will be alerted.

Keywords: KEIL Software, AT89S52 Microcontroller, Induction coils, Buzzer.

1 INTRODUCTION

Now-a-day's technology has grown up rapidly after Wi-Fi becomes widely accepted the wireless communication shows more interest and there has been increasing interest in eliminating the "last cables" research and development of wireless power technology is developed and become the most popular technology in the world [1]. Imagine sitting down on a sofa and reading the newspaper, and placing your mobile phone on the table. The phone starts automatically charge without connectors or cables. You can simply grab your mobile phone at any time and charge it wherever you needed to at home, the office, the library, the local coffee shop. With the help of wired chargers, it is difficult to carry. we could simply forget about USB cables, adapters when traveling, adapters. In this modern technology wireless charging technology is being used for numerous applications by using inductive coupling (e.g. pacemakers, MP3 players, toothbrushes, iPod, digital cameras, laptops, etc.).

To transfer the energy between the two objects electromagnetic field is required this is done by induction principle. This paper is used to charge mobile phone wireless and this method is used for multiple ways such as in securing the mobile from loss or theft. The motivation behind this is, Now-a-day's as technology grownup wireless communication has become one of the most active areas in today's technology development wireless technology covers a very wide range of applications such as MP3 players, cellular telephone or mobile phone. The worldwide wireless communication in the market is very aggressive, and the reported number of cellular telephony subscriptions worldwide has now surpassed the number of fixed telephony subscriptions. Apart from mobile phones, there is a revolution in terms of the number of autonomous electronic devices (e.g. pacemakers, MP3 players, tooth-brushes, iPod, digital cameras, laptops, etc.) [2]

Wireless Power Transfer is an effective and efficient method of transmitting electric power from point A to point B through vacuum or air without using wire. [3]

KEIL software is used to compile and this software uses the C language where the machine language code is written and compiled. For the further process to become simply the code should be converted and dumped into the microcontroller in this process the machine source code is converted into hex code.

2 LITERATURE SURVEY

Tresna Dewi et.al [4] discussed the design and realization of a 12 V lamps, a cell-phone charger and a DC fan through the transmitter (source) powering multiple receivers (loads). A. Gamini Sharma et.al [5] introduce a new idea with the charging of cell phones wireless with the help of microwaves over a large scale. Micro-waves are the radio waves that are used to communicate through two mobile phones. L. Olvitz et.al [6] discussed that a wireless power transfer system is de-signed to get wireless power transmission to the mobile phone. Theory of the wire-less power transfer is explained and a functional wireless charger device is realized. Xiao Lu et.al

[7] propose a novel concept of wireless charger networking that allows chargers to be connected to facilitate information collection and control. Achmad Munir et.al [8] proposed a technique that to get wireless power charging system for mobile device a technique is used based on magnetic resonance coupling. The generated AC signal to be transferred a transmitter circuit is used, to transfer the power of AC signal wirelessly transmitting and receiving radiators

are used to convert AC signal to DC voltage a receiver circuit is used to convert the for charging the mobile device. Khadijat Hassan et.al [9] proposed a technique to change the mobile phone batteries through a multiple receiver wireless power transfer system. Transmitter and two receivers are connected to the system circuit. To understand its behavior, with the help of proposed concept a mathematical analysis of the circuit is carried out and simulated with variation in coupling coefficient and load. Wenzheng Xu et.al [10] discussed that travel distance of an electronic gadget mobile charger has minimized the sum of sensors lifetime get maximized when the use of a mobile charger to wirelessly charge sensors in a re-chargeable sensor. Nathan S. Jeong et.al [11] proposed a technique that a metal wrapped mobile device is enabled using loosely coupled resonant system obtain an efficient wireless charging. To simplify this approach, a metal phone case is used and three coils were designed and distributed on this metal phone case and they are tuned for resonance at 6.78MHz.

3 THEORETICAL BACKGROUND

Since early 20th century, Wireless power transfer becomes the most popular technology in the world and this technology is being used in many electronic applications and using the electromagnetic (EM) field which is generated in the coils this wireless power transfer is enabled between physical objects. A magnetic flux is produced around the coils due to transmit of AC current to the induction coil. [11]

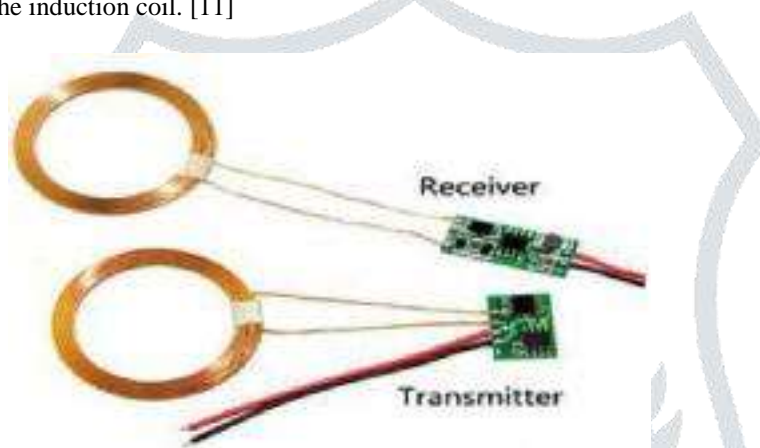


Fig.1. Induction Coils

Now-a-day's embedded technology is being used by many industries for stable and accurate control. Microcontroller (AT89S52) heart of the system which allows dynamic and faster control for the system. With the help of Liquid crystal display 16x2 (LCD) makes the system to display the charging of a mobile phone. The AT89S52 microcontroller is the main part of the system were all the functions of the system are controlled by this microcontroller. This paper is used to charge mobile phone wireless and this method is used for multiple ways such as securing the mobile from loss or theft. If anyone wants to steal it without putting off the switch automatically a 60 Db siren will get switched ON.

AT89S52 Microcontroller is a programmable device. A microcontroller has a lot of peripherals Random Access Memory, Read Only Memory, Input/output ports, CPU, Analog to Digital Converter and a timer all on a single chip. For many applications in which cost and space are demanding microcontroller contains on-chip Read Only Memory, Random Access Memory and number of Input/output ports makes them optimal. [12]

To transfer electrical energy from the sources to the load without using any conventional media such as cables a technique called wireless electrical transfer or sometimes called contactless energy transfer is a method using electromagnetic induction. [13]

Now-a-day's Inductive coupling playing a major role in achieving wireless power transfer at power levels ranging from several microwatts to several kilo-watts. The efficiency reduces rapidly when the distance is increased between the transmitter and the receiver coils as the power delivery its operating range is defined by the efficiency reduce rapidly. [14]

4 HARDWARE IMPLEMENTATION

The Induction coils use an electromagnetic field when AC current transmit to it and a magnetic flux is generated and energy is transferred between two induction coils. The system consists of Transformer, Rectifier, Filter, Voltage regulator, AT89S52 Micro Controller, Induction charging, Transistor driver circuit, Relays, Liquid crystal display, Buzzer, LED AND LDR Selection. The Block diagram of the system is shown in Fig.2.

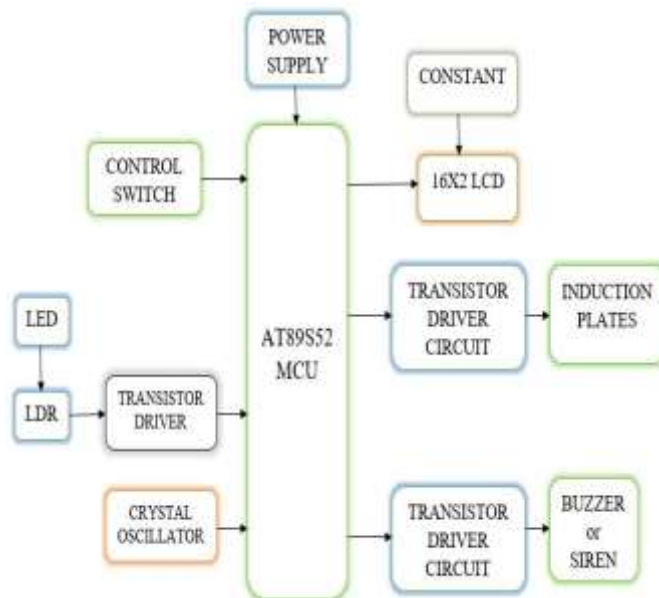


Fig.2. System Block diagram

The regulated power supply is used where the input of the circuit is applied to it. The transformer is used to step down the voltage to the required amount of voltage an input of 230V AC is given from the mains supply and by the use of step-down transformer 12V supply is obtained and is given to a rectifier. From the rectifier, a DC voltage is obtained. Now the obtained dc voltage output of the rectifier may consist of some AC components to eliminate the AC components and to get the pure dc voltage the output of the rectifier is given to filter to make the voltage smooth. Now, to obtain a pure constant dc voltage a voltage regulator is connected to the filter. The Overall Power Supply of a Block diagram is shown in Fig.3.

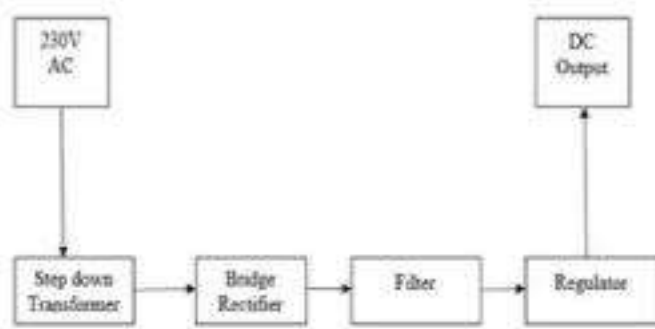


Fig.3. Power Supply Block diagram

Transformers are used for step up or step down the voltage Usually, most of the electronic gadgets or equipment's require DC voltages. The AC input mains sup-ply consists of 230V and here we need a step-down transformer i.e., 230V a.c is to bring down to the required Voltage. To bring down the voltage to a required level a step-down transformer is hooked.

Rectifier

The output from the transformer is given to the rectifier. It converts A.C. to D.C. The rectifier may be of half wave or a full wave rectifier. Full wave rectifier maintains good stability condition and to obtain a good result a full wave rectification is used.

Filter

To remove ripples from the output of the Bridge rectifier capacitive filter is used and which smoothens the d.c voltage. Until it maintains constant Output the voltage and the load never change and received the voltage from this filter is constant. Therefore, a regulator is applied at the output stage

Regulator

Now to obtain a constant DC voltage source a Voltage regulator is used. A 5V and 12V DC power supply are required for this project. 7805 and 7812 are the voltage regulators used to obtain the voltage levels. In this process, the regulators consist of positive supply were the number 78 indicates and the numbers 05 and 12 are the output voltage levels of the regulator.

LED and LDR Selection

LDRs or Light Dependent Resistors are very useful, especially in light/dark sensor circuits. Here in our project to avoid the light from led to falling on to LDR, we place a box up on that will keep our mobile phone. If anyone wants to remove the box, the Buzzer gets switched ON because the light from led falls directly on to the LDR and then the transistor will be ON which is monitored by the microcontroller.

5RESULTS

Thus by using an induction coupling principle, we could energize the coil adjacent to it. The efficiency of transfer was quite low though, but it mainly depends upon the distance between the coils. By increasing the size of the coil efficiency can be further increased, but the size constraint is violated. The anti-theft system could precisely detect the absence of phone on not switching off the power supply. This is a major advantage for bio-medical such as the pacemaker can be charged wirelessly when the battery gets exhausted. The overall implementation of the system shown in below Fig.4.



Fig.4. Overall System Implementation

6CONCLUSION

In today's world, the wireless technology has improved and used in many electronic applications. Especially since wireless communication systems are becoming cheaper, easier to implement and smaller every day, so more and more devices can profit from it. Wireless solutions can be time-saving, easier to use. Also, different applications reveal by wireless conditioning monitoring not even realizable through a wired network.

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