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Transmit Wireless Power by Using Magnetic Resonance

Mrs. Vishakha Saurabh Shah[1], Mr. Saurabh Anil Shah[2]

[1,2]*Assistant Professor at PRMCEAM, Badnera-Amravati, (M.S) (India)*

ABSTRACT

This Paper Proposes to Transmitting wireless power by using magnetic resonance. It is very important for modern system. Now-a-days we are using laptops, sensors, consumer products so it is important to use wireless power transmission. Wireless power transmission is continuously energy transfer. In this paper, it is possible by using magnetic resonant coupling to transmit the wireless power from source coil to a single load.

Index Terms: A/D Converter, IGBT, IC555, Source Coil, Device Coil, Magnetic Field, Embedded Computing, Mobile Computing, Sensor Networks, Micro robotics.

I. INTRODUCTION

In this paper give a short overview of the current technologies exists for wireless power transmission using magnetic resonance. It is based on the principle of electric conductivity. This achieved using big coupled electromagnetic resonators, able to generate very large electric fields, which are propagate most likely either via conduction through the ionosphere or through the intermediate coupling to the earth charge resonance. Tesla is an excellent electrical conductor. The Development of a wireless powered world due to Tesla. In this paper, they used the phenomenon of Resonant Magnetic Coupling for wireless electric power. By using Electromagnetic Induction they developed new technologies for charging small gadgets, such as cell phones and cameras etc. Wireless transmission of electricity will enable self charging of devices and is the need of the hour. By providing electricity wireless to the electronic devices, it is possible to eliminate our dependency on bulky, heavy batteries and power cords. The purpose of this paper is to use wireless electricity for electronics device. Here, Witricity devices are develop, which are capable of charging laptops and other portable devices with increased efficiency. This technology is still in the development stage and lots of work is to be done in improving the range and efficiency of power transmission.

II. RELATED WORK

1] Andre Kurs(2007)[3] :- This paper is focused on self-resonant coils. They were able to transfer 60 watts with 40% efficiency over distances in excess of 2 meters. We conclude that a quantitative model is describing the power transfer, which matches the experimental results to within 5%, was presented.

2] Sagolsem Kripacnariya Singh(2011)[5]:- In this paper, the methods applied for wireless power transmission like Induction, Electromagnetic transmission, Evanescent wave coupling, Electrodynamics induction, Radio and microwave and Electrostatic Induction. In this paper we conclude that Solar power satellites are the future of supplying non conventional energy.

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3] Benjamin Cannon(2009)[9]:- In this paper transmit the power wireless by using magnetic resonant coupling is experimentally demonstrated in a system with a large source coil and either one or two small receivers. We conclude that resonant frequency splitting is observed experimentally and described theoretically for the multiple receiver system.

4] Sayed-Am El-Hamamsy(2006)[13]:- In this paper, the losses in an RF switching power amplifier and their frequency dependence are explained. The losses are analyzed the switching, conduction, and gate drive losses. The last of these are usually ignored in lower frequency applications, but must be accounted for at the frequencies of interest in this paper (> 10 MHz).

5] Aristeidis Karalis(2007)[14]:- This paper focused on the physical phenomenon of long-lifetime resonant electromagnetic states with localized slowly-evanescent field patterns can be used to transfer energy efficiently over non-negligible distances, even in the presence of extraneous environmental objects. We conclude that by using real world model situation establish non-radiative scheme can lead to strong coupling between two medium.

6] Prof.Vishal V. Pande(2014)[15]:- In this paper, we present the concept of transmitting power without using . This concept is known as Resonance Inductive Coupling (RIC). It will further reduce the dependence on the fossil fuel and other petroleum products that directly leads to the Global warming.

7] Vikas Choudhary(2011)[17] :- This paper includes the techniques of transmitting power without using wires with an efficiency of about 95% with non-radiative methods. This paper as a whole gives an effective, high performance techniques which can efficiently transmit the power to the required area varying in distances.

8] Qiang Zhao(2015)[18]:- This paper suggests, magnetically coupled resonators coils in a strongly coupled near field for wireless power transfer. Here, a simple circuit topological structure, the series-shunt-mixed resonant coupling, is presented with better performance in the transfer distance and efficiency. The work in this paper provides a deeper understanding of the underlying principles of coup the proposed mixed-resonant coupling model has showed an excellent performance in WPT, making a further step for the magnetically coupled resonant structures toward practical applications.

9] Jong-Ryul Yang(2013)[21]:- This paper focused on a class E power amplifier including coupling coils is proposed for application in a wireless power transfer system using magnetic coupling. The system with the differential amplifier shows 6.95W of transmitted power and 44.6% transmission efficiency at 6.8MHz with 14-cm distant coils. The drain of the transistor in the amplifier links to the source coil of the wireless power transfer network. A highly efficient transmitter of the WPT system can be obtained by using the proposed amplifier with the network designed to consider impedance difference and cooling devices.

III. PROPOSED CONTROL DESIGN

In this paper proposed system introduce Magnetic Resonance coupling, when two objects exchange energy through their varying or oscillating magnetic fields then magnetic coupling occurs. Resonant coupling occurs when the resonant frequencies of the two objects are approximately the same. Inductive coupling uses magnetic fields that are generated when current flow through a wire. Evanescent waves are always associated with matter, and are most intense within one-third wavelength from any radio antenna. The electromagnetic waves tunnel, they would not propagate through the air to be absorbed or dissipated and would not disturb.

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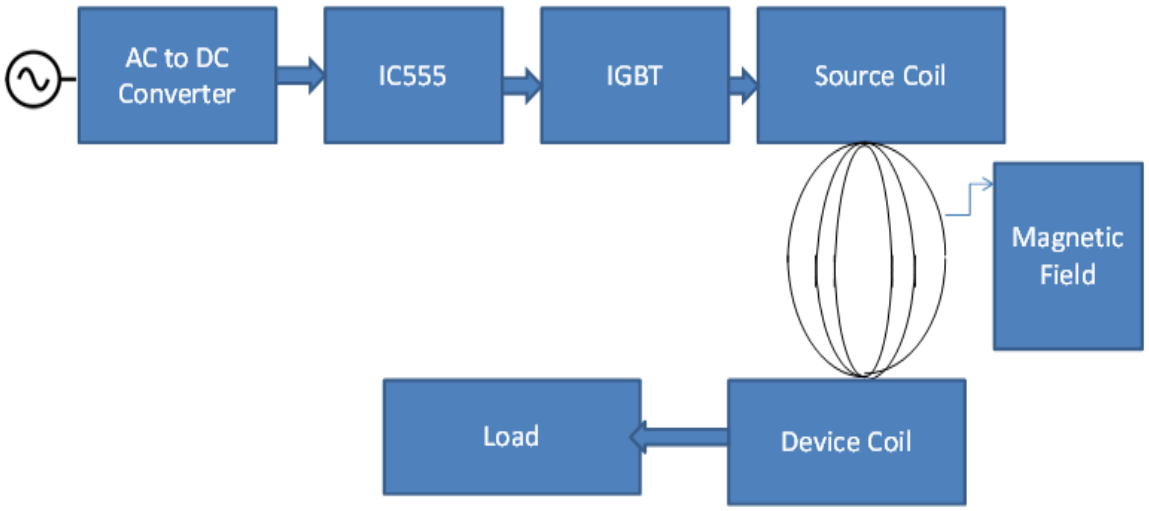

Fig 1: Block diagram of Wireless Transmission of Electricity

In this Block Diagram it consist transmitter is composed of an ac/dc converter. This converter will convert 230V, 50 Hz AC to 12V DC voltage which is given as supply voltage to the frequency oscillator. The output of AC/DC converter is given to 555 timers IC. It can produce a single pulse when triggered or it can produce a continuous pulse train as long as it remains powered. Here, Source coil and Device Coil act as a transmitter and receiver. The energy transmission is unaffected even if the line of sight between the source and device coil is interrupted.

IV. IMPLEMENTATION AND TESTING

In this paper, the transmitter consists of an ac/dc converter, an IC555, an IGBT and a copper coil which acts as an antenna. The voltage regulator IC is used to increase current and maintain the output voltage at a constant value. The IC555 circuit generates a signal whose frequency is equal to the resonant frequency of the source and device coils of about 100 KHz. Driver circuit is used to provide 12V to the IGBT. The IGBT collects efficiencies of all equipment, amplifies the signal and drives the transmitting coil. When the signal passes through the source coil, a magnetic field is set up. Since the frequency of the driving signal is equal to the resonant frequency of the coil, resonance occurs. Thus, resonant magnetic coupling take place between the two inductively coupled coils and energy is efficiently transferred. The magnetic field generated by the source coil inks with the device coil and emf is induced in it. A current is generated because of the induced emf and thus, the load is powered.

V. CONCLUSION

Magnetic resonance coupling is an efficient way of energy transmission than inductive coupling. The efficiency can exceed 95% if the source and receiver very close to each other. The transmission distance is independent in the size of the receiver coil and the size of the receiver coil can be reduced to such an extent that it can be embedded into various devices like cell phones, laptop, etc. They both have a same resonant frequency. Therefore, we conclude that Wireless Electricity is a boon for devices which use midrange energy. By using this technique it is possible to eliminate dependency on heavy and bulky batteries.

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