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WIRELESS CHARGING OF MOBILE PHONE USING MICROWAVES

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Abstract *—*

In this paper the main purpose is shown to make the charging of mobile phone anywhere you want to without charger this is done only when there is a use of microwave[3].

Mobile phone becoming basic part of life. The microwave signal is transmitted from transmitter special kind of antennas called slotted wave guide antenna. That is the frequency of 2.4 GHz[3]. The microwaves are the part of electromagnetic spectrum. Microwaves wavelength range of 1mm to 1metre and frequency is 300KHz to 300GHz.The main objective of this research paper transmitter and receiver are also should be very powerful device, the distance increases the charging speed is constant .Made in mobile phone handsets which are additional of sensor, rectenna and a filter.

Keywords-component;

Microwave generator, Transmitting antenna , Rectenna, Sensor, Microwave slotted guide antenna , mobile phone.

INTRODUCTION:

The microwaves are radio waves they wavelength range from longer for one meter to shorter from one millimeter. The prefix "micro-" in "microwave" is not meant to suggest a wavelength in the micrometer range. It is indicates that microwaves are "small" compared to waves used in typical radio broadcasting, in that they have shorter wavelengths[1].

This paper is main objective increasing the distance from transmitter and receiver then do not change the charging speed , this is the constant.

Microwaves are especially suitable for this use since they are more easily focused into narrow beams than radio waves, allowing frequency reuse; their comparatively higher frequencies allow broad bandwidth and high data transmission rates, and antenna sizes are smaller than at lower frequencies because antenna size is inversely proportional to transmitted frequency[1].

Microwaves are used in spacecraft communication, and much of the world's data, TV, and telephone communications are transmitted long distances by microwaves between ground stations and communications satellites. Microwaves are also employed in microwave ovens and in radar technology[4].

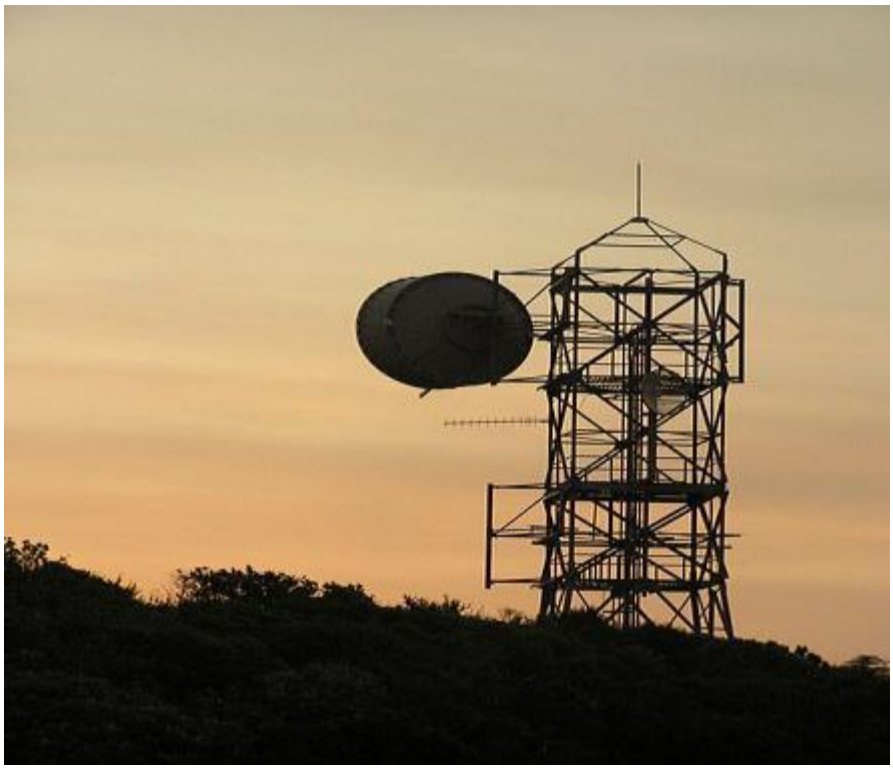
With mobile phones becoming a basic part of life, the recharging of mobile phone batteries has always been a problem. The mobile phones vary in their talk time and battery standby according to their manufacturer and batteries. All these phones irrespective of their manufacturer and batteries have to be put to recharge after the battery has drained out

The main objective of this to make the recharging of the mobile phones independent of their manufacturer and battery make. In this paper a new proposal has been made so as to make the recharging of the mobile phones is done automatically as you talk in your mobile phone.

This is done by use of microwaves[1].

The microwave signal is transmitted from the transmitter along with the message signal using special kind of antennas called slotted wave guide antenna at a frequency is 2.45 GHz.

I.



Wireless Power Transmission System:
Nikolas Tesla was first transmitted electricity without wire and known as the father of wireless electricity transmission. Wireless power transmission works on the principle of Magnetic induction. We are put one coil carrying current through it, it creates a magnetic field near to it. And if we put other coil over there than it is induce by the first coil and it current from it. This is the principle of magnetic induction[2].

A. Wireless Power Transmission System:

The principle that how the power can be transfer through space using microwaves. This principle of wireless power is consists of two parts One is transmitting part and the other is the Receiving part. At the transmitting end there is one microwave power source which is actually producing microwaves[2].

B. Components of Wireless Power Transmission System:
There are three important components of Microwave generator, Transmitting an-tenna, and the receiving antenna.

1. Microwave Generator:
The Microwave Generator is the one which generates the microwave of preferred frequency. It generates the Microwave by the interaction of steam of elections and the magnetic field[1].

2. Transmitting Antenna
Transmitting antenna are use to transfer the signal from free space to the device. There are many kind of slotted wave guide antenna available. Like parabolic dish antenna, micro strip patch an-tennas are the popular type of transmitting antenna. Signal are transfer for one place to another place[1].

3. Rectenna
It is the elements are usually arranged in rectenna. The current is included by the microwaves in the rectenna is rectified by the diode which powers a load connected across the diode. Scotty diodes are used because they have low voltage drop and high speed so that they have low power loss. Rectenna are highly efficient at converting microwave energy above 90% have been observed with regularity[1].
The basic addition to the mobile phone is going to be the rectenna. A rectenna is a rectifying antenna, a special type of antenna that is used to directly convert microwave energy into DC electricity. Its elements are usually arranged in a mesh pattern, giving it a distinct appearance from most antennae. A simple rectenna should be constructed from a Schottky diode placed between antenna dipoles. The diode rectifies thes current induced in the antenna by the microwaves.

It has been theorized that similar devices, scaled down to the proportions used in nanotechnology, could be used to convert light into electricity at much greater efficiencies than what is currently possible with solar cells. This type of device is called an optical rectenna. Theoretically, high efficiencies can be maintained as the device shrinks, but experiments funded by the United States National Renewable energy Laboratory have so far only obtained roughly 1% efficiency while using infrared light. Another part of our receiver circuitry is a simple sensor[2].

System Design:

The system design is wireless charging of mobile phone using microwaves mainly consist of four parts as transmitter design, receiver design, the Process of Rectification, sensor Circuitry.

A. Transmitter Design:

A magnetron is a diode vacuum tube with filament in which filament act as the cathode shown in fig 3. Magnetron is actually behaved as an oscillator to produce microwaves. It can be done by putting magnet between the resonating chambers which is the center of the oscillator. These resonating chambers are name as anode in the magnetron. When electrons come out from the cathode and go direct towards the Anode, it passes through the magnetic field. It starts circulating in the resonating cavity and start producing waves according to its frequency. And the generated RF signal by this flow outside of the chamber[5].

B. Receiver Design:

The basic addition to the mobile phone is going to be type of antenna that is used to directly convert microwave energy into DC electricity. Actually the size of rectenna can be reducing using the Nano technology.We also have to add a sensor at receiver side[5].

As we know we are going to charge the phone while a person is talking. So here sensor is used to detect wither the phone is using microwaves or not[5].

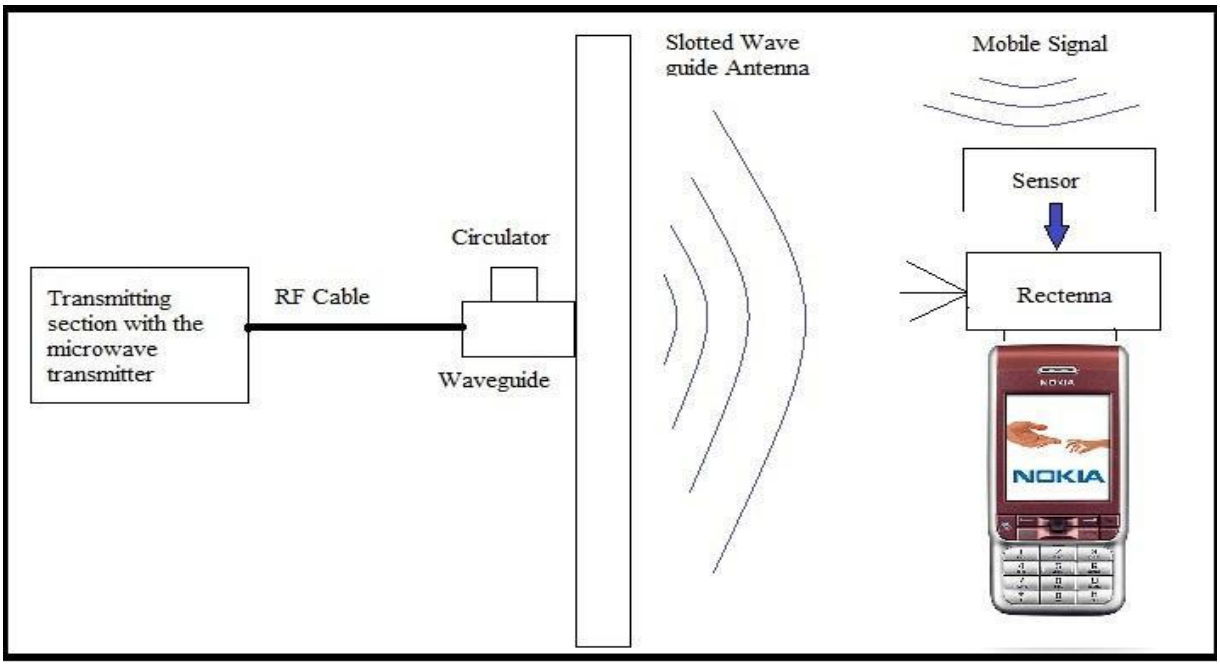
C. The Process of Rectification:

Microwave can easily travel through the media but it also loses some energy. So our key objective is to rectify the circuit and to rectify the waves at the low cost. And also we have to make the detection more sensitive. As we know that bridge rectification is more efficient than the single diode we use this for the better performance. We use the shottky diode to get the batter Impedance[5].

D. Sensor Circuitry

The sensor circuitry is a any message signal. This is very important as the phone has to be charged as long as the user is talking. Thus a simple frequency to voltage converter would serve our purpose. And this converter would act as switches to trigger the retina circuit to on. So when our phone is receiving microwave signal it make the recteen circuit on and charge the battery[5].

Working of Device:



Inductive Charging:

Some mobile handsets on market provide wireless charging , the technology is not exactly same as mentioned. For charging phone are required to keep the charging plate.

LIMITATION:

The Mobile Handset should additionally have a device, "Rectenna" which would make it bulky and hence device size up to molecular level is essential. The main disadvantages of wireless charging are its lower efficiency and increased resistive heating in comparison to direct contact. Implementations using lower frequencies or older drive Technologies charge more slowly and generate heat within most portable electronics. Due to the lower efficiency, devices can take longer to charge when supplied power is equal[1].

CONCLUSION:

This paper is successfully to method of using the power microwave to charging the mobile phone without wire .we do not enough time to be constantly at one place and recharging our mobile phones. it is use of the rectenna and a sensor in a mobile phone could provide in the revolution of mobile Phone. Communicating media need recharge without being interrupted.

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