An Unique Power Transfer Methodology As Source For Moving Electrical vehicle

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***Abstract*—** It is known that the technological advancements are increasing at a faster pace. But the utilization of various sensors is very low in various sectors. It is known that we are constantly depending upon renewable energy resource for operating various devices. The most commonly used devices are solar lamp. The advances make the wireless power transfer (WPT) very attractive to the electric vehicle (EV) charging applications in both stationary and dynamic charging scenarios. This paper reviewed the technologies in the WPT area applicable to EV wireless charging. By introducing WPT in EVs, the obstacles of charging time, range, and cost can be easily mitigated. Battery technology is no longer relevant in the mass market penetration of EVs. It is hoped that researchers could be encouraged by the state-of-the-art achievements, and push forward the further development of WPT as well as the expansion of EV. So as the petrol prices are hiking at a faster pace, it is possible that we will use electrical bikes. But the charging station is static. So we propose a system to charge this vehicle using PIC microcontroller development board.

***Keywords*—** **Electric Vehicle, Wireless Power Transfer, Battery electric vehicle**

I. INTRODUCTION

An electric vehicle, also called an EV, uses one or more electric motors or traction motors for propulsion. An electric vehicle may be powered through a collector system by electricity from off-vehicle sources, or may be self-contained with a battery, solar panels or an electric generator to convert fuel to electricity. EVs include road and rail vehicles, surface and underwater vessels, electric aircraft and electric spacecraft. EVs first came into existence in the mid-19th century, when electricity was among the preferred methods for motor vehicle propulsion, providing a level of comfort and ease of operation that could not be achieved by the gasoline cars of the time. Modern internal combustion engines have been the dominant propulsion method for motor vehicles for almost 100 years, but electric power has remained commonplace in other vehicle types, such as trains and smaller vehicles of all types.

Electric cars are measured by the same safety standards as standard cars, and many have the highest 5-star ratings. There have been (very rare) reports of lithium ion batteries catching fire and exploding, but extra safety measures are installed to ensure this cannot happen. These include fuses and circuit breakers, plus coolant run through battery packs to keep them at a low temperature.

Fans of petrol cars argue that chemicals in an electric car battery will catch fire in the event of a crash. However, a tank full of petrol is about as flammable as you can get. This is why some people believe electric cars are in fact the safer option. Electric cars are a more environmentally-friendly option than traditional cars because they produce no tailpipe emissions. However, they are not considered carbon neutral unless the electricity they run on is generated from a renewable source. In simple terms, an electric car is a one powered by an electric motor rather than a traditional petrol/diesel engine. This electric motor is powered by rechargeable batteries that can be charged by common household electricity.

A battery electric vehicle (BEV) has far fewer moving parts than a conventional gasoline-powered vehicle. There's no need for liquid fuels or oil changes. There's no transmission or timing belt to fail when you least expect it. In fact, most of the maintenance costs associated with an internal combustion engine are eliminated.

II TYPES OF ELECTRIC VEHICLES

2.1 Hybrid Electric Vehicles (HEVs)

HEVs are powered by both petrol and electricity. The electric energy is generated by the car's own braking system to recharge the battery[1]. This is called 'regenerative braking', a process where the electric motor helps to slow the vehicle and uses some of the energy normally converted to heat by the brakes.HEVs start off using the electric motor, then the petrol engine cuts in as load or speed rises. The two motors are controlled by an internal computer which ensures the best economy for the driving conditions. The Honda Civic Hybrid and Toyota Camry Hybrid are both examples of HEVs.

2.2 Plug-in Hybrid Electric Vehicles (PHEVs)

Also known as Extended-Range Electric Vehicles (EREVs), this type of EV is powered by both petrol and electricity. PHEVs can recharge the battery through both regenerative braking and 'plugging-in' to an external electrical charging outlet[2]. In EREVs the petrol engine extends the range of the car by also recharging the battery as it gets low.

2.3 Battery electric vehicle (BEV)

A battery electric vehicle (BEV), battery-only electric vehicle (BOEV), full electric vehicle (FEV) or all-electric vehicle is a type of electric vehicle (EV)[3,4] that uses chemical energy stored in rechargeable battery packs. BEVs use electric motors and motor controllers instead of internal combustion engines (ICEs) for propulsion. They derive all power from battery packs and thus have no internal combustion engine, fuel cell, or fuel tank.

III IMPLEMENTATION

The proposed system consists of two sections. The transmitter section is used at the road section. The IR sensor is used to detect presence of vehicle. The RF receiver is used to detect the signal transmitted from the RF transmitter. If the RF receiver receives the signal and then the IR is detected in the transmitter section, then the driver circuit activates the power transfer mechanism. The second section is the Car section. The car section consists of the IR device to detect the driver and if the driver is detected[5,6], then the RF transmitter transmits the signal to the RF receiver to the transmitter section. Based on the signal it starts power transfer.

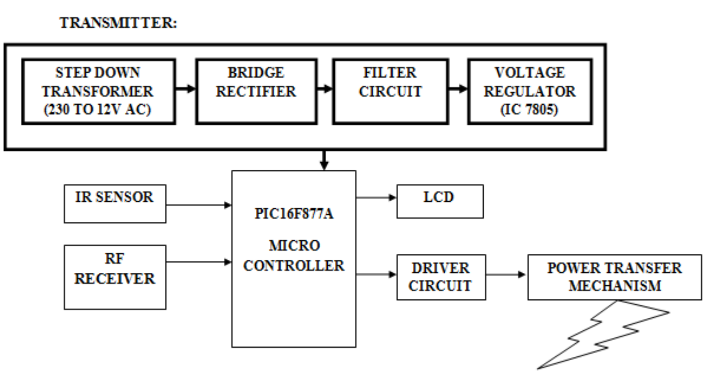

Figure.1 Transmitter Block

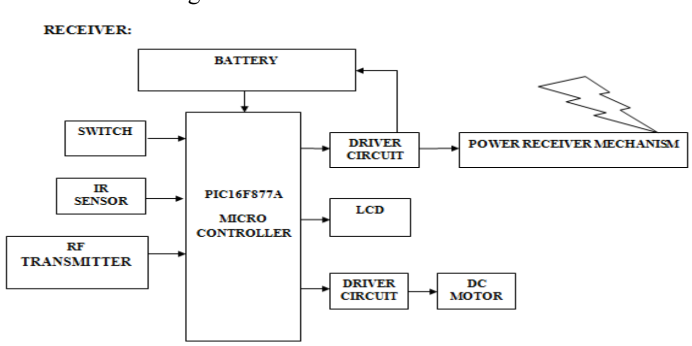

Figure.2 Receiver Block

PIC16F877A is used for the transmitter side and receiver side. ULN2003 driver circuit is usedto drive DC motor for demonstration purpose.The Proteus tool was used for initial design of the circuit with MPLAB IDE to develop the programming.

IV RESULTS AND ANALYSIS

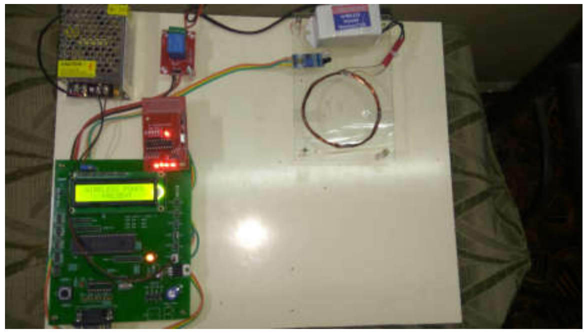

Figure. 3. Transmitter Implementation

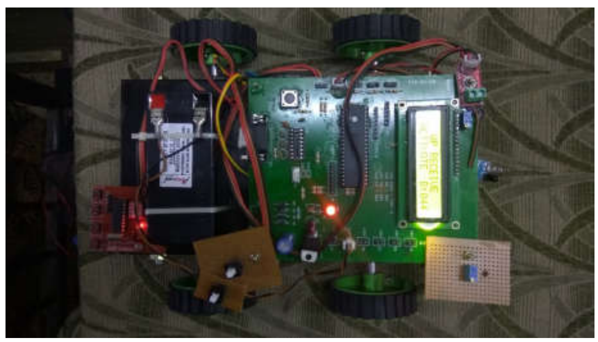

Figure. 4. Receiver Implementation

V CONCLUSION

Wireless power transfer has the potential to change this planet on so many different levels. Whether it is charging a handheld device, to changing the effect of global warming on this planet, wireless power transfer has an answer. Wireless technology has become viable reality. The most commercially viable application arising to counter the effects of global warming and the increasing demand for electricity is WPT through microwave transmission from space. With WPT through resonance and inductive coupling, emerging tech companies are able to broaden the capabilities of most small electronics including cell phones, PDAs, and in big applications such as charging a car.

REFERENCES

[1] Siqi Li Chunting Chris Mi, "Wireless Power Transfer For Electric Vehicle Applications", IEEE Journal of Emerging and Selected Topics in Power Electronics (Volume: 3, Issue: 1, March 2015) .

[2] FaicalTurki, Volker Staudt, Andreas Steimel, "Dynamic Wireless Ev Charging Fed From Railway Grid: Grid Connection Concept", Electrical Systems for Aircraft, Railway, Ship Propulsion and Road Vehicles (ESARS), 2015 International Conference.

[3] Xiaolin Mou Hongjian Sun, "Wireless Power Transfer: Survey And Roadmap" Vehicular Technology Conference (VTC Spring), 2015 IEEE 81st .

[4] Yiming Zhang,Zhengming ,ZhaoKainan Chen, " Frequency Decrease Analysis Of Resonant Wireless Power Transfer" IEEE Transactions on Power Electronics (Volume: 29, Issue: 3, March 2014)

[5] Jiejian, DaiDaniel, C. Ludois "Wireless Electric Vehicle Charging Via Capacitive Power Transfer Through A Conformal Bumper", Applied Power Electronics Conference and Explosion (APEC),2015 IEEE

[6] Jiejian Dai, Daniel C. Ludois, "A Survey Of Wireless Power Transfer And A Critical Comparison Of Inductive And Capacitive Coupling For Small Gap Applications", IEEE Transactions on Power Electronics (Volume: 30, Issue: 11, Nov. 2015)