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Solar Based Wireless Charger

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ABSTRACT :

The system charges wirelessly. It utilizes electromagnetic fields in charging by the use of electromagnetic induction. In collaborative induction, the energy changes from the bias (transmitter and receiver). Electricity from the sun is an input to the transmitter induction coil, while the receiver induction coil receives electricity to convert it into current and charge the battery.

Keywords: Transmitter, Receiver, Solar, Battery.

1. Introduction :

Wireless charging is a new technology moment. Wireless charging is also referred to as wireless power transfer; Samsung introduced wireless charging on the Galaxy s6 phones in 2015. Wireless charging is also called inductive charging. Wireless charging generally eliminates the need for lines for charging. Reduces wear and tear and gash on tackle anchorages.
Compared to the wired charging, wireless charging has many advantages that are as listed below.

- Stoner-friendly because it doesn't contain a string. Different phones can use the same charging pad.
- More quality products, i.e. no water pollution and dust
- Provides easy relief, Charging connection lines are more expensive.
- No electrical hindrance

Gradual development is being accomplished through two enormous strategies, one as electric wireless charging or radio frequence(RF) grounded wi-fi charging and inductive charging or Coupling grounded wireless charging. Radiation wireless charging is primarily based on electromagnetic waves, essentially broilers and radio frequence waves, which converts electricity into an electrical shape. The transmission of power is primarily based on the energy of an electric powered current, or in different phrases, electricity. Second, RF- grounded wi-fi charging has the capacity to feature at low electricity levels considering that publicity to RF is a safety problem. Inductive charging is based totally on the principle of collective induction wherein a glamorous discipline hyperlinks coils collectively. Finally, the glamorous area of electromagnetic swells decays as presto as the electrical subject and as a result the energy spreads over a long time. Time. Distance Great restriction. Inductive charging is utilized in our diurnal lifestyles due to protection and practicality.

2. Literature Survey :

Photovoltaic Technology In the beginning, PV cells have been particularly silicon- based, offering margin at approximately 15- 20. New equipment, such as perovskites and natural photovoltaics, had come on stream promising higher efficiency and flexibility at cheaper costs(Kojima et al., 2009). This has enhanced sun electricity possibility and applicability to various applications, which consist of mobile bias and small- scale buildings.[1]
Wireless energy transfer(WPT) technology allows energy to be transferred from a power source to an electrical cargo without the use of physical connectors. This technology is observable increasing relinquishment in patron electronics, especially in mobile bias charging.[2]
Reverberative Inductive Coupling To overcome the limitations of the traditional inductive coupling, reverberative inductive coupling transformed into proposed. In this, power switch over short distances is achievable more accurately and with additional misalignment tolerances(Kurs et al., 2007). This type has been crucial in shaping the use of wireless charging in real operations.[3]
Challenges and opportunities The most basic challenging situations in integrating those technologies have to do with energy conversion efficiency, value, and physical limits of wireless strength transfer- range and orientation, for instance. However, the discreet benefits such as speeded-up independence from the grid power supply and ease of use still function as effective forces riding along with additional improvements within the area.[4]Proposed System
This is a solar-powered wireless bowl that provides sustainable and mobile charging outcomes for minor bias. It harvests solar power in the form of a photovoltaic panel, which it regulates with a charge regulator, and stores the energy in a rechargeable battery. A DC-DC motor provides stable voltage

affair to drive the wireless charging module. Wireless power transfer (WPT) is achieved with the inductive coupling action that allows for unblemished energy transfer without using physical connectors. The system is portable, environment-friendly, and suitable for use out-grid, providing a protean and reachable result for powering the smartphones, smartwatches, and even low-power bias.

4. Methodology :

The solar-grounded wireless bowl operates with the use of solar energy as a renewable energy source. A photovoltaic(PV) panel traps sun and transforms it into direct current(DC) electricity. The power is also controlled by a charge regulator to protect the battery from overcharging and voltage fluctuations. The controlled power is stored in a rechargeable battery, freezing harmonious energy emptiness indeed at low- light periods. A DC-DC motor regulates the voltage relationship so that it is in accord with the module of wireless charging requirements. Wireless power transfer(WPT) utilizes inductive coupling, in which a transmitter coil emits an electromagnetic field to transmit energy wirelessly to a receiver coil embedded in the mobile device. This process eliminates the need for bodily connectors with an accessible and environmentally friendly charging outcome suitable for out-of-grid and mobile uses.

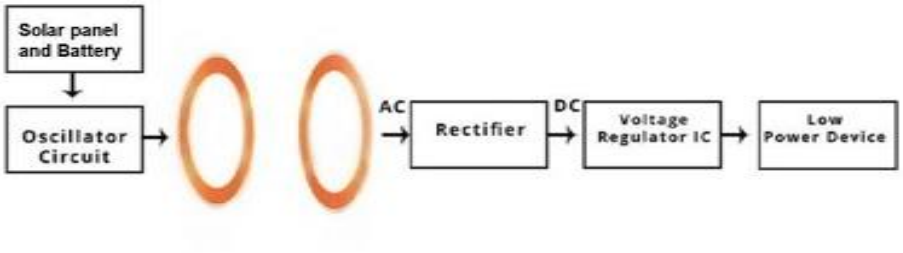

Figure 1: Block Diagram

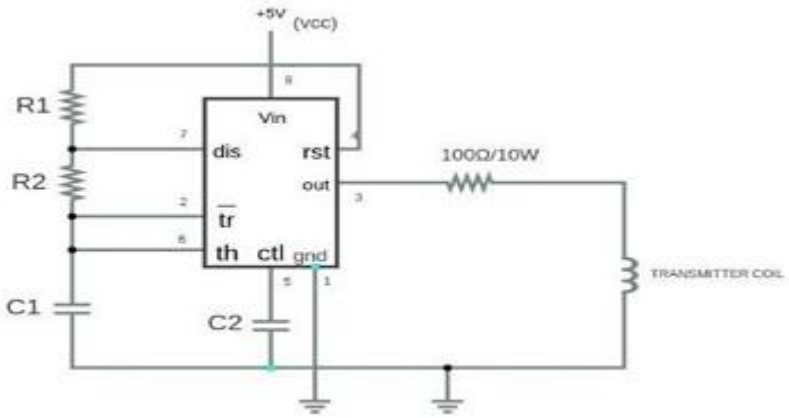

Fig. 2 Transmitter circuit using IC555 timer

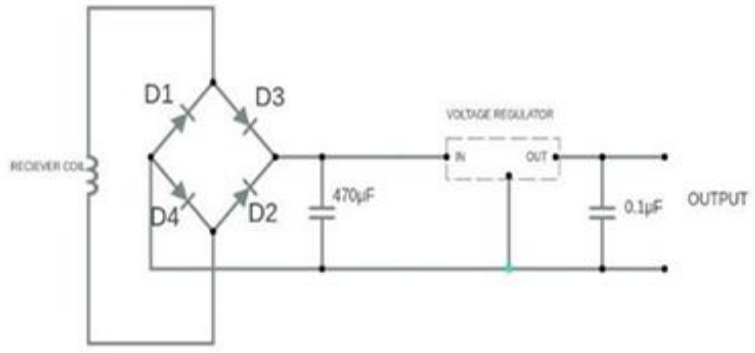

Figure 3: Receiver Circuit Using Bridge Rectifier

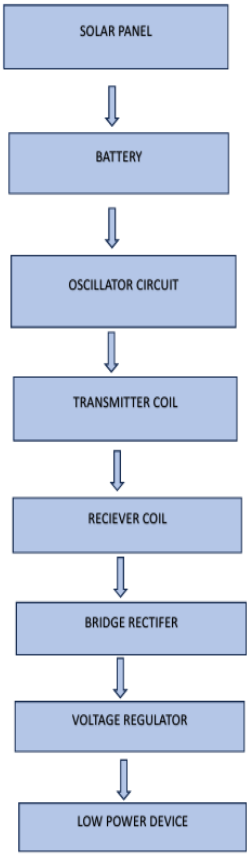

Figure 4: Flow Chart

5.Results And Discussion :

The solar- grounded wireless bowl was successfully developed and tested under colorful conditions, which demonstrated dependable performance in converting solar energy into usable power for wireless charging. Under optimal conditions, the system achieved a wireless charging effectiveness of roughly 70- 75, which is slightly lower than wired systems but respectable for wireless technology. The solar panel delivered an average power affair of 5-7W under direct sun, although performance greatly plummeted in low light or cloudy conditions, requiring cold-blooded energy results or much more efficient solar panels. An integrated battery promised continued charging since it was designed to store sufficient energy to charge a smartphone in its entirety, even when sun was not approachable. The bowl showed comity with multiple Qi-enabled bias, though minor alignment adaptations were sometimes needed for effective power transfer. The compact and featherlight design made the system movable and accessible for out-of-door use.

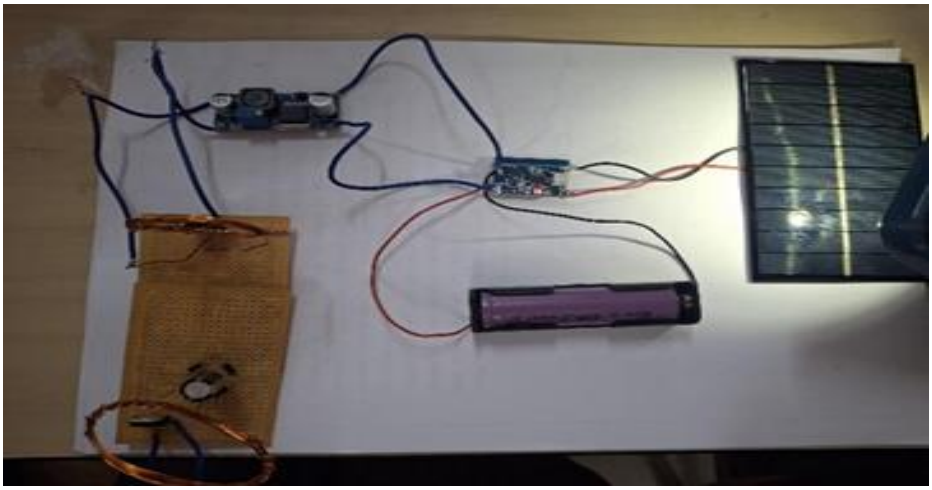

Figure 5: Experimental Setup.

6.Conclusion :

The Solar-Based Wireless Charging Mini Project is a compact, sustainable charger powered by sunlight for charging electronic devices wirelessly. The project integrates photovoltaic cells to capture and convert sunlight into electrical energy that is then stored in a rechargeable battery. The stored energy is utilized to power a wireless charging module and charge devices including smartphones and tablets through wireless charging by eliminating physical cables.

7.Future Scope :

A solar- predicated wireless coliseum is promising in its future. Advancements are to be seen in the following multiple areas solar panel effectiveness and wireless power transfer technology will make possible the speedy and more reliable charging of the coliseum. Integration with an IoT system would optimise charging by sheeting the intensity of sun light and user conditions. Portability advancements will make the coliseum suitable for out- of- door exertion, disaster relief, and remote locales. also, cold- thoroughbred energy systems combining solar power with other renewable sources like wind or kinetic energy can meliorate responsibility. Wider harmony to charge multiple bias, including wearables and electric vehicles, will expand its usability. espousing eco friendly paraphernalia will make the system more sustainable, while marketable scalability could see its integration into public spaces, smart municipality structure, and communal vehicle centrals

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