

SELF CHARGING EVs

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Abstract- The development of Self-Charging Electric Vehicles (EVs) represents a significant advancement in automotive technology, addressing key challenges in sustainable transportation. Traditional electric vehicles rely on external charging infrastructure, often limiting their convenience and long-range capabilities. Self-charging EVs, however, leverage innovative technologies, such as regenerative braking, solar panels, and advanced energy harvesting systems, to generate power during the vehicle's operation. These systems enable the vehicle to recharge its battery, reducing reliance on external charging stations and increasing the vehicle's range.

This abstract explores the various mechanisms behind self-charging technology, including the integration of solar cells on the vehicle's surface, regenerative braking systems, and energy recovery from motion or external factors like temperature and wind. Additionally, it discusses the challenges in improving efficiency, minimizing weight, and maximizing energy output from these systems to ensure they complement traditional charging methods.

The concept of self-charging EVs presents a potential breakthrough in making electric vehicles more accessible, reliable, and environmentally sustainable, fostering a future with reduced carbon emissions and energy dependence. In conclusion, while self-charging EVs are still in the developmental phase, on-going advancements in energy management, battery technology, and renewable energy integration hold the promise of transforming the automotive industry towards a more self-sufficient, eco-friendly future.

INTRODUCTION

Self-charging electric vehicles (EVs) are an innovative concept in the world of sustainable transportation. These vehicles incorporate advanced technologies that allow them to recharge their batteries while in motion, reducing the dependency on external charging stations. Unlike traditional EVs, which require an external power source (such as a charging station) to replenish their batteries, self-charging EVs generate electricity

on the go, using various energy recovery and generation methods.

LITERATURE REVIEW

Self-charging electric vehicles (EVs) have sparked considerable interest in the automotive industry as an innovative solution to the common challenges faced by traditional EVs, such as range anxiety and frequent charging needs. While still a relatively new concept, self-charging EVs promise to enhance convenience, energy efficiency, and sustainability. In this review, we'll take a closer look at their advantages, drawbacks, and what the future holds for these vehicles.

Reduced Range Anxiety: One of the main selling points of self-charging EVs is the reduction in range anxiety — the fear of running out of battery while on the road. By incorporating features like regenerative braking and solar panels, self-charging EVs can extend the driving range, offering drivers more confidence on longer trips or in areas where charging stations are scarce.

Energy Efficiency: Self-charging EVs employ regenerative braking systems, which convert kinetic energy from braking into electrical energy. This process helps recharge the battery while the car is in motion, increasing overall energy efficiency. This not only makes the vehicle more economical in terms of energy use but also reduces wear and tear on brake components.

Sustainability and Eco-Friendliness: Self-charging EVs often feature solar panels, which help reduce reliance on conventional charging stations. By tapping into renewable energy sources, such as solar power, these vehicles contribute to reducing their carbon footprint. This is a significant advantage for eco-conscious drivers who are looking for ways to make their transportation even more sustainable.

Convenience: The convenience factor is another attractive feature. With solar charging and regenerative braking working continuously to recharge the battery while driving, drivers can enjoy reduced dependence on charging infrastructure. This could be particularly beneficial for those in rural or less-developed areas where charging stations are limited.

OVERVIEW OF SELF CHARGING EVs

Self-charging electric vehicles (EVs) represent a significant advancement in the world of electric mobility, offering a hybrid solution that blends traditional electric vehicle technology with energy regeneration systems. These vehicles are designed to recharge their batteries while driving, using innovative technologies like regenerative braking and, in some cases, solar panels or onboard generators. The goal is to reduce the dependency on external charging stations, offering a more sustainable, energy-efficient, and convenient driving experience.

1. **Regenerative Braking:** One of the primary features of self-charging EVs is regenerative braking. When the vehicle slows down, the electric motor acts as a generator, converting kinetic energy (energy from motion) into electrical energy. This recovered energy is then stored in the vehicle's battery, reducing the need for external charging and improving the overall energy efficiency of the vehicle. And also by using faradays lay of electro magnetic induction the electricity can be generated and used to run the vehicle

2. **Electro magnetic induction:** Electromagnetic induction is the process by which a change in magnetic field within a conductor induces an electric current. It is the fundamental principle behind how generators and transformers work.

1. **Magnetic Field and Conductor:** When a conductor (such as a wire) is placed in a magnetic field, the electrons in the conductor experience a force due to the magnetic field.
2. **Movement or Change in Magnetic Field:** If the magnetic field changes (for example, by moving a magnet near the conductor or changing

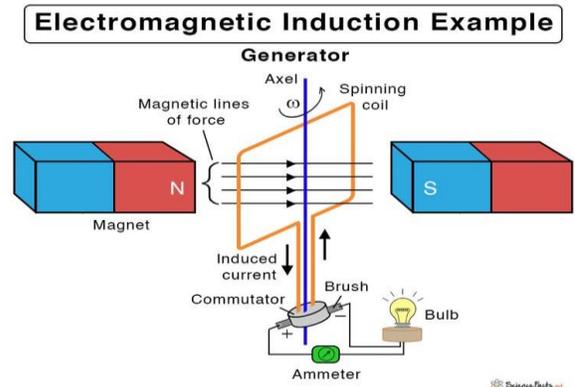
the strength of the magnetic field), it causes the electrons in the conductor to move.

3. **Induced Electric Current:** This movement of electrons creates an electric current in the conductor. The faster the change in the magnetic field, the stronger the induced current will be.
4. **Onboard Generators (Optional):** In some hybrid self-charging vehicles, an onboard generator is used to generate electricity while the vehicle is in motion. This system supplements the vehicle, allowing for more extended driving range when necessary.

WORKING PRINCIPLE

The working principle of electromagnetic induction is based on Faraday's Law of Induction, which states that a change in magnetic flux through a conductor induces an electromotive force (EMF), or voltage, in the conductor. This induced voltage causes a current to flow if the conductor forms a closed loop.

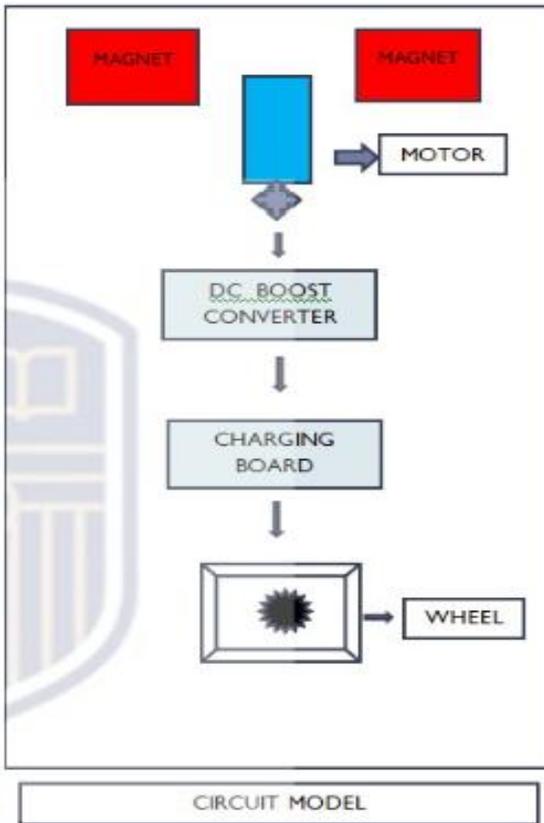
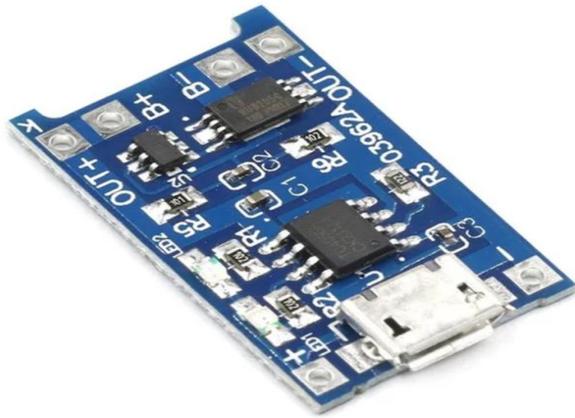
In simpler terms, electromagnetic induction occurs when a magnetic field around a conductor changes, causing an electric current to be generated in that conductor.



a current of 2v of 0.5a is produced this 2v of current is converted into 5v with the help of dc voltage boost converter .dc voltage boost converter (xl6009) is a step up voltage transmitter which is used to increase the voltage from 2v to 30v.

with the help of 5v of current one battery is charged with the help of a mobile charging board (hq2h66158a) in WHICH the red light indicates charging and the blue light indicates full charge of battery while this one bettery is charging another one battery will produce the

voltage to run the vehicle which acts as a self-charging EVS



HARDWARE REQUIRMENTS

1. Neodymium Magnets
2. Dc motor
3. DC VOLTAGE BOOST CINVERTER (XL6009)
4. MOBILE CHARGING BOARD (HQ2H66158A)
5. Wires
6. Wheels

APPLICATIONS

Improved Energy Efficiency: Self-charging EVs are highly energy-efficient, as they capture and store energy that would otherwise be wasted. For example, regenerative braking recycles energy during deceleration, making the vehicle more efficient than traditional vehicles that lose this energy as heat.

Reduced Need for External Charging: By using onboard technologies to recharge the battery, self-charging EVs reduce the frequency with which drivers need to visit charging stations. This is especially beneficial in areas with limited charging infrastructure or during long road trips.

Eco-Friendly: Self-charging EVs that use solar panels or renewable energy sources can help reduce the vehicle's overall carbon footprint. By utilizing clean energy for recharging, these vehicles contribute to a more sustainable, environmentally-friendly transportation solution.

Reduced Range Anxiety:

One of the major concerns for electric vehicle owners is range anxiety—the fear of running out of battery power while driving. Self-charging EVs help alleviate this concern by using regenerative braking and solar panels to recharge the battery while on the road, extending the vehicle's range.

Future Scope

While self-charging EVs are still in their infancy, the concept holds great promise for the future of electric transportation. As technologies improve, such as more efficient solar panels, better energy storage systems, and advancements in regenerative braking, self-charging EVs could become even more efficient and capable of extending their range without relying on external charging stations. The increasing focus on sustainable, energy-efficient solutions in the automotive industry suggests that self-charging EVs could play a significant role in reducing the global carbon footprint.

CONCLUSION

Self-charging electric vehicles offer a glimpse into the future of electric transportation, combining the advantages of renewable energy, energy regeneration, and traditional EV technologies. While they can't completely eliminate the need for external charging, they provide drivers with greater convenience, reduced range anxiety, and improved energy efficiency. As the technology continues to evolve, self-charging EVs could become a key part of the solution for a more sustainable and efficient transportation system.

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