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Faculty of Science and Technology

Group Report 1

(Patent Application) [UG 11408 ON CAMPUS]

VoltHitch - Roof-Mounted Battery System for Electric Vehicles

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Description

Portable Charger for EV Cars

Introducing VoltHitch: Your On-the-Go EV Charging Solution

Unleashing the Power of VoltHitch

Is the constant worry about finding an EV charging station during road trips getting tiresome? Are they frustrated by the fear of cutting short their adventures due to a low battery? Introducing the new VoltHitch Portable Power to solve all worries. VoltHitch Portable Power is like a mobile power buddy, always ready to give the electric vehicle (EV) a boost wherever and whenever they need it. VoltHitch makes power easily accessible!

VoltHitch isn't just an ordinary charger, it's a game-changer in EV technology. This ingenious battery pack adds substantial energy to the EV significantly increasing its range.

Now, drivers can confidently embark on long journeys, knowing they have got extra power in reserve. Whether they are off on a remote camping adventure or navigating a busy city, the VoltHitch Portable Power Battery keeps their EV charged up. Just plug it in and recharge while parked, ensuring they are always ready for the next part of the journey.

Solar Powered Sustainability

The VoltHitch comes with built-in solar panels on its roof. These panels soak up sunlight and continuously charge the battery pack as they drive. It's an eco-friendly feature that means it's not just using electricity to power the EV, but it is utilised while it's moving. Empowering EV, anytime, anywhere: VoltHitch is not the typical EV charger; it's a game-changer in EV technology. It's designed to sit conveniently on top of the car, like a personal power station that goes wherever user's go. VoltHitch is designed for ease.

Effortless Attachment

The VoltHitch is effortlessly attached using U square bolts, which can be secured to a car roof rack or car roof basket with ease.The VoltHitch is always ready to charge your EV, ensuring uninterrupted movement. Whether you prefer a quick plug-in charge

when available or harnessing the sun's power to maintain a full battery during your journey, it serves as the ultimate backup, guaranteeing you never experience the inconvenience of a low battery again.

Empower your EV, Anytime, Anywhere

VoltHitch isn’t just about charging your EV, it's about unleashing the full potential of electric mobility. It's about the freedom to explore, the confidence to go the extra mile, and the satisfaction of knowing you’re driving on the sunshine. Say goodbye to range anxiety and hello to endless possibilities with VoltHitch.

Don't let charging worries stop you from exploring the world in your electric vehicle. VoltHitch is here to empower your EV, wherever your adventures take you. Enjoy the freedom to drive electric, anytime, anywhere, with VoltHitch – Your EV's Best Companion!

Size/Weight and Model Convenience

One of the significant factors for this VoltHitch is the size of the battery which fits all midsize EV models weighing 90 kg to be exact.

Adding to it, the battery pack can easily be attached or removed from the car by using square U-bolts to hold the battery firmly in place and using wrench to tighten the bolt securely to the car roof rack or basket.

A common range for the weight of such a portable battery pack might be between approximately 22.7 kilograms to approximately 68 kilograms. Midsize EVs for instance, the Tesla model 3, typically come with midrange battery packs ranging from 50 to 75 kWh in capacity which are essential for powering the vehicle and are a key component of the EV's architecture, contributing significantly to its weight. The batteries for the midsize EVs weigh around 320 to 450 kilograms.

Their substantial weight is primarily due to the dense and numerous lithium-ion battery cells contained within. These cells store electrical energy and are arranged in modules or packs to create the required capacity. The weight also comes from the protective casing, cooling systems, and other structural components that ensure safety and efficient operation.

Display the battery percentage

One of the elements that effectively communicates the battery usage and charge status in VoltHitch is the LED light sensor, strategically positioned on the side of the battery. This LED light features a user-friendly colour display, ranging from a deep, dark blue to a vibrant light blue, mirroring our logo's blue colour palette. This intuitive

display not only flashes to alert you when the battery is running low and needs charging but also signals when it's fully charged, ensuring you stay informed at a glance.

Claims

Claim 1: A roof-mounted battery system for electric vehicles (EVs), comprising:
- A battery pack capable of storing electrical energy.
- An integrated solar panel system.
- A secure mounting system enabling attachment of the battery pack to the roof of an electric vehicle.
- A bi-directional energy connector.

Claim 2: The battery pack in Claim 1 is designed with a capacity of approximately 75 kWh, adaptable for various EV models, capable of charging an average midsize EV up to half of its battery.

Claim 3: The integrated solar panel system in Claim 1 is positioned on the top surface of the battery pack, providing continuous charging to the battery while the EV is in motion and at a standstill.

Claim 4: The roof-mounting system in Claim 1 ensures secure and aerodynamic attachment of the battery pack without exceeding the roof load capacity of the vehicle.

Claim 5: The connector in Claim 1 allows for bi-directional energy transfer, enabling the EV to charge the battery pack when needed and later use the stored energy for vehicle propulsion.

Claim 6: The battery pack in Claim 1 weighs 90 kg and is specifically designed for midsize EVs with dimensions of:
- Length: 42.6 in / 1.08204 m / 108.204 cm
- Width: 22 in / 0.5588 m / 55.88 cm
- Height: 11.811 in / 0.2999994 m / 30 cm

Claim 7: This system provides an eco-friendly and sustainable charging solution for EVs as the integrated solar panels harness solar energy, reducing reliance on grid electricity and promoting environmentally responsible driving practices.

Claim 8: The battery pack in Claim 1 features a side light bar indicating battery level and a flashing mechanism for full or near-empty battery pack alerts.

Claim 9: Claim 1's battery packs include a power button for manual initiation of charging.

Abstract

VoltHitch: Revolutionizing EV Travel

VoltHitch is an innovative on-the-go EV charging system created to provide owners of EVs a level of freedom and sustainability never before possible. This novel battery pack has been perfectly incorporated into the design of a car and is suitable for midsize EVs. Not only does it considerably extend the range of an EV by adding substantial energy, but it also has built-in solar panels that collect energy from the sun while driving.

Long-distance driving with EVs will be revolutionised by the idea of a portable electric car battery. In addition to extending the driving range of EVs over vast distances, this invention incorporates a solar panel system that transforms a vehicle into a selfsufficient energy source. These portable batteries are continuously charging thanks to solar energy through the solar panels that are fitted on top of the battery pack. This dual electric system ensures that electric vehicles may undertake lengthy journeys with confidence and the least amount of stress possible by providing an environmentally friendly and economically advantageous alternative to traditional EV charging stations. This invention frees drivers from the need for frequent charging stops and allows them to travel far while reducing their carbon footprint.

VoltHitch does not require any difficult installations and is simple to operate. It provides independence, assurance, and happiness when travelling in an EV.

Drawing