



A BATTERY HANDLING SYSTEM AND A BATTERY PACK THEREOF

IITM Technology Available for Licensing

Problem Statement

- Electric vehicles (EVs) use **battery packs** for **propulsion**. These battery packs are **externally rechargeable**, via combustion engines, or by **swapping** them with fully charged ones.
- Current battery swapping mechanisms are based on **skateboard models**, which place the battery **beneath the passenger compartment**.
- Existing automated battery swapping systems are **complex, costly, and have intricate locking mechanisms**.
- Future battery technology goal is to **reduce battery size and weight**, making it possible to place the battery under the vehicle's bonnet and also to overcome above mentioned limitations by developing a more **efficient and cost-effective battery swapping solution for EVs**.
- Thus, a **Battery Handling System** and a **Battery Pack** thereof is disclosed in this patent.

Technology Category/ Market

Category: Automobile & Transportation, Energy, Energy Storage & Renewable Energy

Industry: Automotive and Transportation Industry, Battery Technology, Electric Vehicle (EVs) and Hybrid Vehicle Segment

Applications: This invention **simplifies & expedites battery swapping** for electric and hybrid vehicles, **benefiting public transportation**, fleet management, urban mobility services, rural areas with limited charging infrastructure, vehicle rentals, industrial equipment, **electric motorcycles**, emergency services, and **energy storage**, making **electric propulsion** more **accessible, efficient, and cost-effective in many sectors**.

Market: The global EV battery market was valued at **\$23.8 B** in **2021**, is projected to reach **\$108.2 B** by **2031**, growing at **16.6% CAGR** from **2022** to **2031**.

Intellectual Property

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TRL (Technology Readiness Level)

TRL – 3; Proof of Concept

Research Lab

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Technology

The present patent discloses a **battery handling system and a battery pack for an electric vehicle**. It comprises of:

a. Battery Pack Design:

- **The battery pack includes rechargeable batteries on a platform in an electric vehicle. It has a base with guide rails, a wall with connectors for energy, and a locking mechanism. It can release the battery when a tool engages it.**

b. Battery Housing:

- **The battery unit has a housing to hold the rechargeable batteries and allows energy transfer to the vehicle. It has provisions for locking, grooves for tool engagement, and wheels for sliding.**

c. Battery Handling System:

- **This system includes the battery pack, a storage module with guide rails and connectors, and a tool for moving batteries between the platform and storage. It uses sensors & controllers for secure handling.**

d. Battery Storage Module:

- **It has compartments with guide rails and connectors for battery storage, ventilation, and a smart management system, using sensors and a controller to secure and release batteries via the transportation tool.**

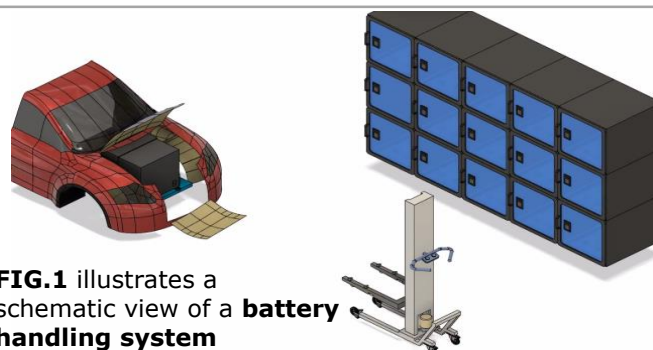


FIG.1 illustrates a schematic view of a **battery handling system**

Key Features / Value Proposition

Increased Productivity: Boost industrial efficiency with faster battery replacements for electric equipment, reducing downtime.

Cost-Efficiency: Reduce manufacturing, maintenance and operational costs, making electric machinery more economically viable.

Adaptability: Accommodate various battery sizes for versatility in industrial applications.

Simplified Operations: Streamline battery swapping with user-friendly technology, reducing complexity.

Efficient Swaps: Fast & hassle-free battery swaps.

Versatile Use: flexibly Works with various e-vehicles.

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