



Neobolt Wheelchair

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Abstract: Neobolt is an innovative, motorized wheelchair attachment developed by the Indian Institute of Technology (IIT) Madras to enhance mobility and independence for people with lower limb disabilities. It is designed to convert a conventional manual wheelchair into a motorized, roadworthy vehicle capable of traveling up to 10-12 kilometers on a single charge. Powered by a rechargeable battery and equipped with features such as a comfortable seating arrangement, headlamp, horn, and brake, Neobolt enables users to navigate both urban and rural terrains with ease. Its affordable price point, coupled with a durable and ergonomic design, makes it a practical solution for users in low and middle-income settings.

Keywords— NeoBolt, motorized wheelchair, Neomotion, lithium-ion battery, all-terrain, and electric wheelchair.

I. INTRODUCTION

Mobility is a fundamental aspect of life, yet millions of people worldwide struggle with mobility impairments due to age, accidents, or congenital conditions. Wheelchairs have long been a primary solution, but traditional manual wheelchairs often limit users' independence, especially in outdoor environments. The advent of electric mobility solutions has significantly improved the quality of life for wheelchair users. Among these innovations, Neobolt wheelchairs stand out as a game-changer, offering greater independence, convenience, and versatility.

Advantages of Neobolt Wheelchair:

- The Neobolt wheelchair offers several advantages over traditional wheelchairs, primarily focusing on enhanced mobility, independence, and all-terrain capabilities.
- It allows users to navigate various terrains, including uneven surfaces, thanks to its powerful motor and shock-absorbing suspension. Additionally,
- It boasts a quick and easy attachment design, enabling users to switch between a regular wheelchair and a motorized scooter with minimal effort.
- Useful for handicap people.
- The users can be travel from one place to another individually.
- They can work outside and get their own source of income.
- Eco-friendly to environment as it is battery operated.
- Can be kept in small area.

Neobolt Wheelchair: Empowering Mobility with Innovation The Neobolt wheelchair is a cutting-edge mobility solution designed to enhance the independence and freedom of wheelchair users. Engineered with a perfect blend of power and performance, it is equipped with a robust 60V/26A battery that ensures reliability and long-lasting usage. The heart of this machine is an 800-watt motor, delivering smooth acceleration and the power needed to handle urban and semi-urban terrains with ease.

One of the standout features of the Neobolt is its range of 10-12 km on a single charge, making it ideal for daily commutes, errands, and short trips without the worry of frequent recharging. It achieves an impressive top speed of 28-30 km/h, allowing users to move swiftly and safely, reducing dependency on others for mobility.

Designed by me, the Neobolt reflects a user-centric approach, focusing on safety, comfort, and ease of use. The ergonomic design ensures proper posture and support, while the lightweight yet durable frame provides stability without compromising on maneuverability. The detachable mechanism allows users to connect and disconnect the Neobolt attachment effortlessly, transforming a manual wheelchair into a motorized vehicle in seconds.

With a modern, sleek aesthetic and practical performance features, the Neobolt wheelchair represents a revolution in personal mobility. It not only supports individuals in navigating their environments with confidence but also promotes an active, independent lifestyle.

II. MATERIAL AND METHOD



1. BATTERY

BATTERY: It has a lithium-ion battery of 60V and 26 mpr. In full charge, the range will be 10-12 km.

2. MOTOR



It has an 800W hub-mounted motor and a 25 to 30 kilometers per hour top speed.

3. CONTROLLER



In the context of electric bikes (e-bikes), the controller is the "brain" that manages all electrical components, controlling the motor's power, speed, and other functions based on rider input and sensor data.

4. BRAKE



In the Neobolt Wheelchair, this drum brake system is used for braking.

5. WHEELCHAIR



This wheelchair will be attached to the Neobolt with the help of locking clips.

III. RESULTS AND DISCUSSION

Designed to work with the NeoFly wheelchair, it transforms the manual chair into a powered, roadworthy vehicle, enhancing mobility for users. This innovative device attaches to the NeoFly wheelchair, transforming it into a roadworthy vehicle capable of reaching speeds up to 25-30 km/h and covering distances of up to 10-12 km per charge, even on uneven terrains.

The Neo Bolt wheelchair is a high-performance, lightweight, and compact mobility aid designed for active users. Here are some key features and benefits:

Key Features:

1. Lightweight frame: Made from high-strength, aircraft- grade aluminum or carbon fiber, making it easy to maneuver and transport.
2. Compact design: Folds easily for convenient storage and transportation.
3. Adjustable components: Allows for customization to fit individual user needs.
4. High-performance wheels: Provides smooth and efficient movement.

Benefits:

1. Increased mobility: Enables users to navigate various terrain with ease.
2. Improved independence: Enhances user autonomy and confidence.
3. Customization: Allows users to tailor the chair to their specific needs.
4. Durability: Built with high-quality materials for long lasting performance.

IV. WORKING



- The user straps the NeoBolt onto the front of the wheelchair and can drive it independently.
- The NeoBolt is a battery-powered, motorized add-on that converts a NeoFly wheelchair into a road vehicle.
- The NeoBolt wheelchair is an innovative, motorized, foldable electric wheelchair designed to provide users with mobility and independence. It features a compact, lightweight design and is equipped with a powerful electric motor, making it suitable for indoor and outdoor use.

V. CONCLUSION

The device is powered by a rechargeable battery and can reach speeds of up to 28-30 km/h, with a range of about 10-12 km on a single charge. It is designed for safety, ease of use, and affordability, addressing common challenges faced by wheelchair users, such as limited mobility, dependency on others, and accessibility issues in public transport.

The sturdy build, user-friendly controls, and protection from weather elements make it suitable for daily use.

Overall, Neobolt enhances the quality of life for its users by providing them with greater freedom and dignity. It stands as a symbol of inclusive innovation, combining engineering excellence with social impact. With further support and accessibility, Neobolt has the potential to revolutionize mobility aids not just in India, but globally.

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VII. REFERENCES

- [1] IIT Madras Develops India's First Indigenous Motorized Wheelchair Vehicle.
- [2] CHENNAI, 23rd August 2021: Indian Institute of Technology Madras has developed India's first indigenous motorized wheelchair vehicle that can be used not only on roads but even on uneven terrains.

[3] NeoBolt was developed by a team led by Prof. Sujatha Srinivasan, Department of Mechanical Engineering, IIT Madras, and has been commercialized through a startup called 'NeoMotion.' The Startup has been co-founded by Prof. Sujatha Srinivasan and an IIT Madras Alumnus Mr. Swostik Sourav Dash, who is the CEO of NeoMotion.

[4] Swostik Sourav Dash, Co-Founder and CEO of NeoMotion, said, "NeoFly and NeoBolt are presently being used by over 600 users across 28 States in India.

[5] It was developed to empower wheelchair users with a convenient, safe and low-cost mode of outdoor mobility as compared to cars, auto rickshaws and modified scooters. It is powered by a Lithium-Ion Battery, and is a motor-powered attachment that converts the SVLSL wheelchair into a safe, roadworthy vehicle.

