Title of the Project : Development of electric three wheeler for physically challenged people

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Introduction

Scooters with three wheels have gained popularity as a mobility aid for those with impairments. They are made to specifically meet the requirements of those who, because to age or a medical condition, have reduced movement. Three-wheeler scooters are perfect for indoor use because of their tiny shape, which enables them to fit into tight spaces like corridors and corners. Additionally, they are portable and lightweight, making them simple to move from one location to another.

Another key benefit of three-wheeled scooters is their simplicity of operation. Because of their straightforward and user-friendly design, people with disabilities may easily operate them. The majority of models include straightforward controls that are simple to grasp and operate, letting users to easily regulate their mobility.

Even while travelling over rough terrain, modern suspension systems offer a comfortable ride. People with mobility impairments who may find it difficult to navigate uneven ground would especially benefit from this. Another important factor is safety, and three-wheeled scooters are made with safety in mind. Users are kept safe when driving the scooter thanks to features like anti-tip wheels, strong brakes, and reflective lighting.Three-wheeler scooters come in a variety of models, so it's simple for consumers to choose one that suits their unique requirements. While some versions are small and light and intended for interior usage, others are more robust and durable and intended for outdoor use.

Additionally, since they don't require petrol and don't emit any hazardous pollutants, electric three-wheeler scooters are environmentally beneficial. Because of this, they are a green alternative that help people lower their carbon impact.

These scooters come in a range of sizes, from small and compact to larger models that can accommodate larger individuals. This makes it easy for users to find a model that fits their size and weight. Furthermore, three-wheeler scooters are an affordable mobility solution for people with disabilities. They are significantly less expensive than traditional mobility scooters, making them an ideal choice for people who are on a tight budget.

In conclusion, three-wheeler scooters have become a popular option for persons with impairments who need help moving around. They are a great option for anyone searching for a mobility solution because they are simple to use, cosy, secure, and economical. Users can choose a three-wheeler scooter from a variety of models that best suits their needs, whether they require it for indoor or outdoor use, different sizes, or different weights.

Objectives

1) To increase the life of fuel filter. Ensure disabled people's independence and freedom of movement
2) In comparison to typical wheelchairs, offer more stability and easier manoeuvrability.
3) Improve quality of life by making mobility simpler and more comfortable.
4) Decrease reliance on others for movement to enhance both mental and physical health.
5) Encouraging people with disabilities to get out and engage with people will increase interaction with others and participation in society.
6) Offer a less expensive option to high-priced electric wheelchairs, which some people may not be able to purchase or be covered by insurance.
7) Reduce the possibility of accidents involving traditional wheelchairs, such as falls or other mishaps.

Methodology

Identify user requirements: The first stage is to determine the precise demands of the target users, such as their preferences, mobility requirements, and physical restrictions. Surveys, interviews, and focus groups with disabled persons and healthcare professionals can be used to do this.

Conduct research: The three-wheeled scooter's design will be done as the next step in research and development. This includes constructing the control system, testing the safety features, designing the frame and chassis, choosing the proper motor and battery, and so forth.

Define the design specifications: The next step is to specify the three-wheeler scooter's design needs based on the user requirements. This includes details like the scooter's size and weight, the sort of controls, the top speed, the battery's range, and the safety measures. The process of defining the design specifications includes following sub-process.

a) Conceptualization

b) Design refinement

c) Material Selection

d) Analysis and Simulation

Prototype development: The three-wheeled scooter prototype must be created after the design is complete. This entails creating a functioning scooter model based on the design requirements.

Testing and validation: The prototype is then put to the test and validated to make sure it satisfies the design objectives and user demands. This entails putting the scooter through various terrain tests, confirming its range and speed, and inspecting its safety features.

Results

1) Design Result

Design of the three- wheeler scooter for the physically challenged people is successful due to the following parameters:

Ground Clearance	164 mm
Suspension	2.50 – 16 mm
Width between rear wheels	452.2 mm

2) Analysis Result

Analysis of the design is done successfully as the material and dimensions of components used is able to bear the load and stress easily.

Particular Portion of Frame	**Load**
Swing arm	80 N

Tubular Frame	100 N
Hub	20 N
Floor	50 N

3) Testing Result

Testing of the prototype is done successfully by giving the efficient performance and good stability.

Breaking Distance	4 – 6 m
Pickup Torque	6 N-m
Kerb Weight	95 kg

Conclusion

The development of an electric three-wheeled scooter for those with physical limitations has been a success, with the prototype meeting every design goal outlined in the project brief. The scooter offers disabled people a safe, comfortable and environmentally responsible means of transportation. It is a practical and cost-effective solution with little maintenance requirements because it uses electric power.

Numerous research papers and experts in the field of mobility aids were consulted during the design process. As a consequence, a scooter that is simple to use, has excellent stability and safety features, and can be customised to fit the specific needs of disabled people was created.

To ensure that the scooter complied with all applicable safety regulations and was user-friendly, a thorough safety inspection and testing phase were conducted.

In conclusion, the development of an electric three-wheeled scooter for physically challenged persons is a noteworthy accomplishment that could significantly enhance the lives of millions of disabled people worldwide. The scooter offers disabled people a safe, comfortable and environmentally responsible means of transportation. It is a practical and cost-effective solution with little maintenance requirements because it uses electric power.

In terms of mobility aids for the disabled, the development of electric three-wheeler scooters for physically challenged people has been a significant advancement. The accomplishment of this project

demonstrates the value of continued study and development in this field and the possibility for new developments to enhance the quality of life for people with disabilities.

Scope for future work

Unquestionably, the creation of an electric three-wheeled scooter for physically challenged people is a tremendous accomplishment that will have a long-lasting effect on their independence and mobility. Millions of people throughout the world could see a major improvement in their quality of life as a result of the initiative by getting them access to a reliable, reasonably priced, and sustainable form of transportation that suits their individual needs.

There are several potential applications for electric three-wheeler scooters for physically challenged people as technology advances, some of which are covered here.

1) Advancement in battery technology
2) Integration of smart technology
3) Customization of specific disabilities
4) Use of artificial Intelligence
5) Increased accessibility