

ENHANCED PHYSICALLY CHALLENGED SCOOTERS WITH AUTOMATIC BALANCING WHEEL ADJUSTMENT

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ABSTRACT- This paper reports on enhanced physically challenged scooters with automatic balancing wheel adjustment. It mainly aims to focus on retrofitting special features in the existing scooters for physically challenged people. By automating the adjustment of balancing wheel attached parallel to the rear running wheel, the active life cycle of the vehicle can be increased. It is intended to reduce the wear and tear losses of the balancing wheels and to restore the mileage of the vehicle.

Keywords: Balancing wheels, Brake sensor

I.INTRODUCTION

In present scenario, transportation is one of the major requirements of the people for transportation of goods or self from one place to a different place. For a physically disabled or a debilitated person, transportation is a major hindrance and so the mobility of physically disabled people is among the great concern of the human civilization. It is really very hard to realize the problems and sorrows of a physically disabled or debilitated person who is dependent on others or is confined on a wheel chair with a limited mobility. In order to provide effective rehabilitation services to the physically challenged people, the scooters with side wheel attachment has been come into existence

II.EXISTING SCOOTER DESIGNS

In existing scooter design, the balancing wheels attached parallel to the running wheel is constantly in contact with the road surface. There is no facility for lifting the balancing wheels whenever the physically challenged person is able to balance the vehicle during running condition. The continuous running of the balancing wheels along with the running wheels ensue many defects which reduces the performance of the vehicle. Consequently, the active life period of the vehicle decreases.



Fig 1.Existingscooter design

III.LIMITATIONS IN EXISTING DESIGN

Drop in vehicle's mileage due to increased fuel consumption of the balancing wheels. Wear and tear losses of the tyre increases as the balancing wheels run constantly during the running condition. Running cost increases with respect to fuel cost. Maintenance cost increases as the balancing wheels are constantly subjected to friction losses. The dimension of the balancing wheel is large which is not necessary since adequate balance can be provided with the help of smaller balancing wheels with reduced dimension.

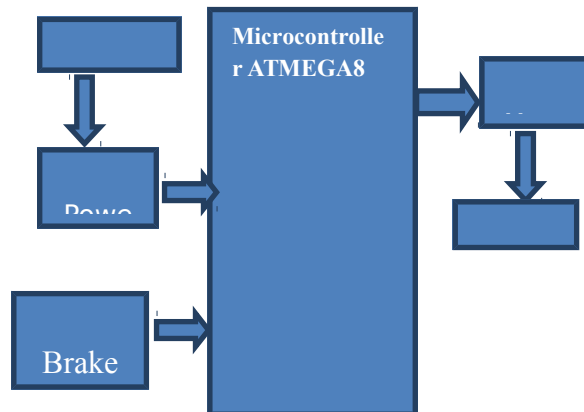
IV.ALTERNATE METHOD

In the proposed method the feature for lifting the balancing wheel is added. This advancement reduces the wear and tear losses of the wheel and increases the mileage of the vehicle. It further helps in improving the performance of the vehicle. This proposed work is done with the help of application of brake. When the brake is applied, balancing wheels are made in contact with the road surface in order to provide balance to the person. When the applied brake is released, the balancing wheels are lifted and the scooter moves forward.

released, the balancing wheels are elevated to a particular height and locked at that level.

controls the up and down motion of the balancing wheels. Two 6V batteries are used in series as main power supply. Capacitors are used to smooth the pulsating DC output after the rectification so that nearly a constant power supply is supplied to the load.

V. BLOCK DIAGRAM



The actual control applied by means of the application of brake. The brake sensor which is a limit switch monitors the status of the brake. It sends a high or low signal according to the brake condition to the microcontroller ATMEGA8 which processes the data received from sensor and stimulates the operation of motor driver which is a relay circuit. The relay runs the motor correspondingly facilitating two operation namely forward and upward motion.

VI. HARDWARE SETUP

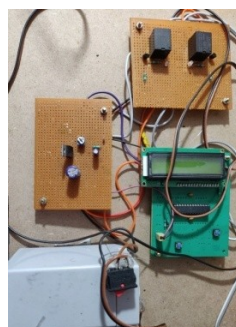


Fig 2. Hardware setup

VII. TECHNICAL ASPECT

A. Power Supply Regulator Circuit

It outputs a value of 5V.7805 voltage regulator is used to provide the regulated power supply of 5V to the relay circuit which

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B. Relay Circuit

Relay circuit assists in the elevation and delevation of the balancing wheels. Two 5pin relays are used in the circuit. One relay aids in the elevation of the balancing wheels and the other aids in the delevation of the balancing wheels.

C. Microcontroller Circuit

Microcontroller used here is ATMEGA8. It is used because of its availability and ease in usage. The output from the brake sensor is processed by the microcontroller and makes the corresponding 5 pin relay ON for the motor operation

VIII. MECHANICAL SETUP



Fig 3. Mechanical setup

IX. WORKING

The motor used for operation is wiper motor. It is a simple dc motor which supports both forward and reverse operation. The brake sensor is a simple limit switch which sends a high signal to the microcontroller when the brake is applied. The microcontroller processes the data and the 5 pin relay which is intended to perform the forward operation is switched ON and the motor runs in clockwise direction which elevates the balancing wheels. If the brake is released a low signal is sent to the microcontroller and it activates the 5 pin relay which is intended to perform the reverse operation. The motor runs in anti clockwise direction and the balancing wheels are delevated to the ground level. The level to which the balancing wheels are elevated and locked is programmable.

X. FUTURE SCOPE

Further development of this design comprises of replacement of the larger balancing wheels with the smaller ones with no

reduction in mechanical strength. Replacement of larger balancing wheel with the smaller ones further increases the mileage and performance of the vehicle.

XI. CONCLUSION

Automation is the technology concerned with the application of mechanical, electronic and a computer based system to operate and control protection. Thus the realization of automated balancing wheel adjustment of vehicles for differently abled people is done and the drawbacks in the existing scooter design is rectified. We developed this project in such a way that it ensures the safety of differently abled person and facilitates the comfort and ease transportation.

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