

Motorized Wheelbarrow

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ABSTRACT: The wheelbarrow is an useful tool that is commonly used for carrying out transportation activities of construction workers, gardeners, farmers etc. One drawback using this conventional wheelbarrow is that it lacks any kind of automation to assist the operator. The main goal of Motorized wheelbarrow is to bring automation in order to help people to conserve their energy but also having more work done in less time. The major step in the designing phase started by the selection of motor that is required to drive the wheelbarrow considering the load and work force required. This was followed by the designing of chassis and other works surrounding it and finally testing the barrow. Another objective achieved was the addition of Reverse breaking and safety feature that aims to ensure the safety of users when carrying heavy loads. The Motorized wheelbarrow is thus being able to moderate the burden on the operator.

KEYWORDS: Motorized wheelbarrow, Reverse breaking and safety feature, Chassis. -vided for better balancing. The required speed is taken to be 10 km per hour and calculations are done in order to obtain specific values including torque angular acc- eleration, etc. The wheelbarrow will be controlled usi-
ng a hall effect throttle. As a safety mechanism, rever- se breaking mechanism is added to the design.

I. INTRODUCTION

Wheelbarrows are conventionally used to carry cement, refuse, tools and other materials. The conventional designs' workings is mainly based on the strength and effort of the worker. The several drawbacks of the conventional wheel barrows limit's its use in wide areas and reduces its effectiveness. This can be overcome by modifying it into a motorized one, simultaneously providing

further attachments in order to reduce the strength requirement and increase the effectiveness. These motorized wheelbarrows will be of wide range applications and hence, they are important in the present day scenario.

II. METHODOLOGY

The design comprises of three wheels. Two of them are connected to motors and the third one is pro- -vided for better balancing. The required speed is taken to be 10 km per hour and calculations are done in order to obtain specific values including torque angular acc- eleration, etc. The wheelbarrow will be controlled usi- ng a hall effect throttle. As a safety mechanism, rever- se breaking mechanism is added to the design.

2.1 DPDT SWITCH WORKING

A DPDT switch has 2 inputs and 4 outputs. Each input can be connected to the 2 corresponding output.

It can connect to 4 different output with 2 inputs and it can switch the circuit into two different types of operations. Because each terminals of the DPDT switch can either be in 1 of 2 position.

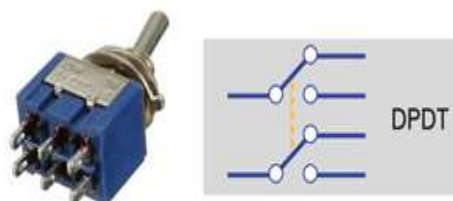


Figure 1- DPDT switch

2.2 CLUTCH MECHANISM

In Anticlockwise rotation the pawls slides through the ratchet and the power is not transferred only the teeth rotates. Teeth in clockwise movement the ratchet and the pawls engage and the whole system rotates.



Figure 2 – Clutch mechanism

2.3 REVERSE BREAKING AND SAFETY FEATURE

If the wheelbarrow is placed in a slope and if we cut of the power from the motor the wheelbarrow will not roll down as when the shaft moves in anticlockwise direction the pawls get engage with the ratchet but the Ratchet is attached to the motor shaft through the chain as the motor has high torque the shaft will not move so The whole system gets stuck and this acts as a brake.

2.4 MOTOR

The motor selected is 24Volt DC motor that gives a power output of 250 Watt.
 RPM (after Reduction) – 300.
 Full load current – 13.4A.
 No load Current – 2.2A Torque Constant – 8N.m (80 kg-cm)



Figure 4- Motor

II. MODELLING



(a)



(b)



)

Figure 5(a,b,c)- Drawn using Fusion 360°

IV. RESULT

The project Motorized Wheelbarrow was successfully completed and was able to work on hard and hilly terrains. This helped to minimize the stress on people and do work more efficiently.

V. CONCLUSION

The Motorized Wheelbarrow will be useful for construction workers, farmers and work can be done with less effort. Thus, helping workers to be more productive.

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