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MEC300

**SOLIDWORKS DESIGN AND
SIMULATION OF STAIRCASE
CLIMBING TROLLEY**

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ABSTRACT

The subject of the study for this project is the trolley. Trolleys are commonly used to transport huge loads with minimal human effort. Carrying things up and down stairs with a regular cart is impossible. Local goods movement is heavily reliant on hand trolleys. To build a stairwell climbing trolley capable of transporting goods up and down the stairwell. To develop a versatile trolley that would aid in stair climbing by connecting various components onto a base trolley and designing the final product using Solidworks software. The development of Solidworks software for designing the trolley's 3D drawing.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF STUDY

The subject of the study is the trolley. Trolleys are commonly used to transport huge loads with minimal human effort. The trolley's production process involves correct design, precise fabrication, and specified analysis using finite element software, which results in improved motion that can withstand large loads with minimal effort. This study looks at how to make a stair climbing trolley with a simple mechanism.

After considering several solutions, it was decided to design a trolley that could transport a weight across a stairwell and to power it manually so that it would be accessible to a large number of people. This will allow for more efficient transport of goods up and down stairs by using less human energy.

Lifting heavy objects to higher floors or levels from the ground is a complex job, especially when there are no lifting facilities available, such as an elevator or a conveyor. This idea has the potential to create a new mode of load transportation over the stairwell. The stair climbing trolley can be useful for transporting goods up and down stairs as well as through uneven terrain.

1.2 PROBLEM STATEMENTS

Regular trolley are impossible to carry goods up and down on staircases. Goods transportation locally is highly dependent on manual trolleys. They are used in warehouses, construction sites, malls, residential re-locations etc. These trolleys have a very huge limitation when it comes to stairs. They can only move on flat surfaces and moving them over a staircase is a very hectic task.

1.3 OBJECTIVE

- To design a staircase climbing trolley to carry goods up and down on staircase.
- To test the trolley material with putting load in the simulation using Solidworks.

1.4 SCOPE OF WORK

The scope of work for this project are:

1. The development of Solidworks software to design the 3d drawing of the trolley.
2. To make sure the dimension of the components suitable for the daily use.

1.5 EXPECTED RESULTS

Image below are the expected results for this project. This design has a lot of benefits so that it is the best design chosen to give useful features to users.

The trolley makes use of a triple interlinked wheel arrangement that allows it to do so. The mechanism uses a trolley with a support wheel arrangement which will be used for support when at rest and will be suspended in air while the trolley is moved by lifting it. The interlinked wheel mechanism consists of 3 freely moving wheels. e.

For this reason, three wheel set on each side of vehicle attached with frame was introduced to provide smooth power transmission in order to climb stairs without obstacles. Frame arrangement is suitable to transmit exact velocity ratio also. It provided higher efficiency and compact layout with reliable service.

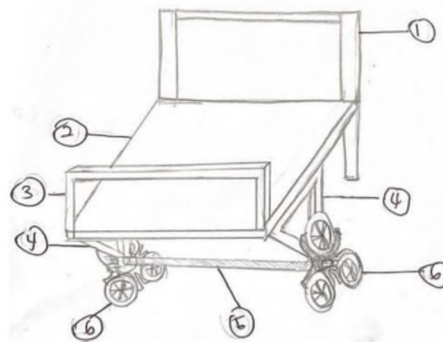


Figure 1: Tri-Star trolley