



اَوْنُوْزِ سَيِّدِي تَيْكُوْلُوْ كِنِي مَبَارَا
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MEC299

**DESIGN AND FABRICATION OF
STAIR CLIMBING TROLLEY**

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ABSTRACT

Hand trolleys are devices that are used to transfer objects from one location to another. They are commonly used in a variety of industries, including warehouses, stores, marketplaces, and homes, with the primary aim of carrying physical items that are difficult to carry owing to their hefty weights. When it comes to moving products beyond ground level, however, there are restrictions where a hand trolley cannot be used, such as uneven terrain or any level above ground is not a simple job, especially if there are no lifting facilities (elevator, conveyer, etc). The main objectives of this project are to design CAD model of Stair Climbing Trolley using Solidwork software and to fabricate Stair Climbing Trolley using some modification from the conventional trolley . In general, the methods or steps of work to be conducted to complete this project will follow the product production flowchart. In conclusion, this project will be successful by design and fabricate the stair climbing trolley to provide the benefits to consumers like for sellers, warehouse workers or humans. Finally, the stair climbing trolley can operate satisfactorily if the objectives have been achieved.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

1.1 Background of Study

Hand trolleys are devices that are used to transfer objects from one location to another. They are commonly used in a variety of industries, including warehouses, stores, marketplaces, and homes, with the primary aim of carrying physical items that are difficult to carry owing to their hefty weights.

However, because to the inability to ascend stairs even for a short flight of steps, its utility declines when moving heavy things from lower to upper floors. When an object must be moved on a flat ground surface, the present product performs admirably, but it becomes extremely difficult when the thing must be lifted up and down stairs. Especially in buildings without elevators, conveyers, or escalators, where there are no lifting facilities.

Furthermore, lifting is not a simple task it needs greater strength and stability depending on the weight of the item to be carried; failing to create the appropriate strength and stability raises the risk of accidents and injuries. Two researchers, Robert and John Forsyth invented the Tri-Star wheels. With two wheels on the ground and one above them, three wheels are positioned in an upright triangle.

This mechanism concept might be used in the project to solve the problem of hauling heavy loads up and down the stairs. The wheel construction of a stair-climbing hand trolley should be modified for it to climb the steps up and down easily.

1.2 Problem Statement

Most hand trolleys are designed to transfer products on a flat surface or at ground level. When it comes to moving products beyond ground level, however, there are restrictions where a hand trolley cannot be used, such as uneven terrain or any level above ground is not a simple job, especially if there are no lifting facilities (elevator, conveyer, etc). As a result, transit from lower ground to higher elevations or vice versa is limited.

The hand trolley might be attempted to navigate the stairs, but there is a larger risk of failure during the lifting process, such as the hand trolley tumbling out of control and causing accidents and injuries. Smaller and round objects, on the other hand, have the largest risk of falling since they do not fit in the trolley area. Human effort is regarded the lone answer for transferring and carrying huge loads above ground. Labor is becoming more expensive, particularly in wealthy countries, where the growth rate is rapidly turning negative.

1.3 Objectives

The main objectives of this project are:

1. To design CAD model of Stair Climbing Trolley using Solidwork software.
2. To fabricate Stair Climbing Trolley using some modification from the conventional trolley.

1.4 Scope of Work

- Can be used on any type of surfaces such as uneven and unstable surface for example rocky and bumpy roads.
- Can be able to function without the need of battery or any electrical power source
- Can be used in places where the process requires moving items from the lower level to the top level or vice versa for example like stairs.