

AUTOMATIC CONVERTIBLE STAIRCASE TO RAMP

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ABSTRACT

Generally, at many places there is no provision for disable people to climb the stairs with the help of this mechanized stairs the person will able to do it. The objective is to transmute the staircase into ramp or platform, so that lame or disable people can make use of it. It is a amalgamation of stairs and ramp so it can use alternately whenever needed, it is a type of portative stairs. Involvement of such mechanized things will help to reduce human work. The main rationale behind working on this topic is to reduce human effort in day-to-day life and vanquish the difficulties. The work is done to bring the conceptual idea into reality. The main concept of mechanized stairs is creating a combination of stair and ramp by implementing mechanical linkages, different mechanism so that it can be use simultaneously as a stairs to ramp as per use or need. As per contemplate there is a major predicament for disable people for climbing stairs so this idea was conceptualized by integrating with mechanical systems. By considering the concept the fabrication was carried out to prepare the stairs by fulfilling three basic requirements viability, technical feasibility and social acceptance.

Keyword: - Ergonomics, Convertible Stair Case, Ramp, and Disable people problem solving.

1. INTRODUCTION

At many places there is no provision for disable people to climb the stairs with the help of the mechanized stairs the person will able to do it. There are many old and physically disable peoples in the world and it is difficult for them to climb stairs as compared to normal persons. So to help them and to help the person who cannot afford lift as their houses are small the project is made. The most concern of this project is to fabricate a mechanism which will lift them up and put them down whenever they want at very low budget.

1.1 OBJECTIVE

To understand the concept, Automatic convertible staircase to ramp and find the possible ways of staircase & ramp structure enhancement. To optimize the possible combinations of staircase & ramp this will be helpful for disable people problem solving. To find ergonomic ways of making convertible staircase to ramp for disable people.

1.2 SCOPE

By considering the concept the design & fabrication of convertible staircase to ramp will carry out to prepare the stairs by fulfilling three basic requirements economic viability, technical and social acceptance for disable people.

2. DESIGN

This project work will first introduce the background of the study. Present the Design constraints that influence on the use, efficiency and benefit their impacts on machine. After that machine part design all different existing machine assembly units will done to make a probable machine model.

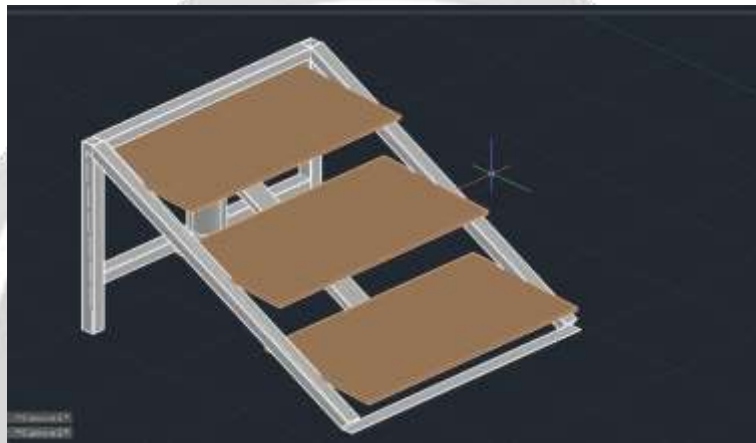


Fig -1: Stairs position

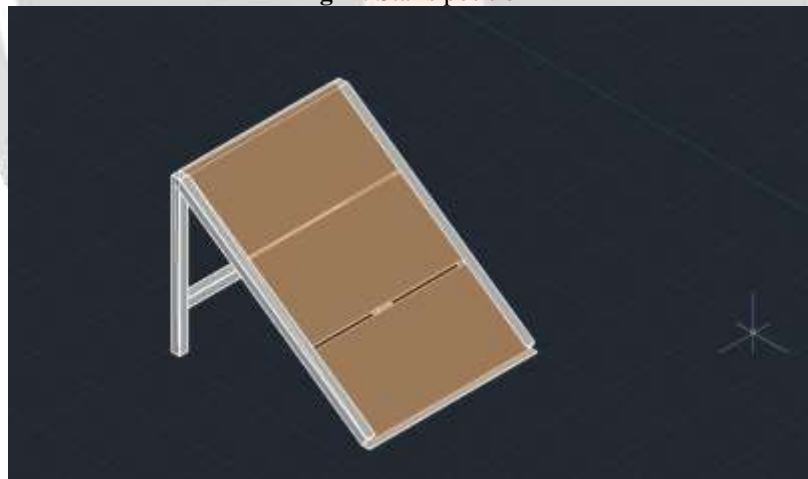


Fig-2: Ramp Position

First we create some rough diagram and then we design in cad software with proper measurement.

2.1 COST

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Cost Sheet

SR.NO	Component	Quantity	Cost in rs
1	Solenoid D.C.V.	1	750
2	Flow Control Valve	2	240
3	Pneumatic Cylinder	1	1500
4	Nut And Bolt	10	50
5	Pneumatic Fittings	3	120
6	Pneumatic Pipe	2Mtr	60
7	Push Button	1	30
8	Wire	2Mtr	20
9	12V Transformer	1	180
10	M.S. Material(frame)	-	1848

2.2 COMPONENT LIST

The following Components we use in our project.

- List Item –
 1. Frame
 2. Double Acting Cylinder
 3. Pneumatic Pipe Fittings
 4. Pneumatic hoses and fittings
 5. Solenoid type 5/2 DCV
 6. Relay Board
 7. Push Button
 8. Voltage Regulator

3. PROCESS OF WORKING

It Consist of main body which is a right angle triangle support structure which holds and supports all the parts. All the load of the body and element is sustained by adjustable stand. Motion to the treads is provided with the help of pneumatic & mechanical linkages structure, which are mounted over the frame. When we apply switch on the solenoid valve which is directly translated to the motion of the treads. Stairs are totally based on pneumatic mechanism which is provide up and slant motion to the treads. In general condition it can be used as normal stairs, when cylinder forward motion is provided to the linkage and the same motion is gained by the stairs which is

meshed with the ramp structure. On converting into stairs it is provided with the self- locking system with the help of pneumatics.

3.1 ADVANTAGES

An automatic convertible staircase to ramp control is implemented with very simple hardware and easy to control. Human intervention while automatic convertible staircase to ramp can be easy which reduce accident of physically disable & old age people. This system has higher safety as compared to another type of staircase system.

3.2 APPLICATION

It is used for adjustable automatic convertible staircase to ramp control in buses

4. CONCLUSIONS

The main goal of the convertible staircase to ramp is used for disable people. Experience through this ramp and stairs are used in separately, by introducing pneumatically operated stairs it can be used with ease and it is practically beneficial.

5. REFERENCES

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