

# Design and Manufacturing of Pneumatically Operated Stairs by Using Scissor Mechanism

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**Abstract** - In many mechanical industries, machinery is on the top or placed floor wise. For excess purpose stairs are used but for stairs more space is required. For space saving, there is improper design of stairs and it is very unsafe for workers towards there. Due to such stairs there are increase chances of accidents. To overcome space problem this project deals with compact design of stairs. Due to compact design space utilization is less and due to proper design, there are very less chances of accident. The stairs operate on scissor mechanism by pneumatic which is safer than hydraulic mechanism.

**1. INTRODUCTION** - The structure of this thesis is planned as follows: in the first part, the theory is presented. It consists of several topics concerning overall lifting tables of scissor type, things that are needed for the design, principles of working, technical characterization and others.

## 2. Body of Paper

### 2.1) Classification of lifting platforms -

To start something new it is needed to look at something that already exists. On the design elevators can be divided into the following main types permanent and portable. The permanent elevators are: scissor raise platforms, track lifting platform, launching and unloading platforms.

### 2.2) Advantage and application -

1) The scissor lift operator turns on the power source. Using a valve to control the flow of fluid or air starts to fill the cylinder(s) with hydraulic fluid (or compressed air in a pneumatic system).

2) The scissor lift control system moves the hydraulic fluid or compressed air from the reservoir to the operating cylinders.

### 2.3) Advantage And Disadvantage -

1) **Advantage** - 1.1) Foldable Pneumatic Stairs Easy To Operate. 1.2) Space required is less than traditional stairs 1.3) Avoid Chances of accident & High load carrying Capacity 1.4) Maintenance Cost is less.

**2) Disadvantages** - 2.1) Initial cost is high 2.2) This System used where air compressor is used otherwise cost may vary.

### 2.4) Technical characteristic of the lift

Loading capacity,kg	700
Height of rise,mm	1260
Rise time,sec.	40
Initial Height, mm	40
Mass,kg	125

## CONCLUSION

The project was carried out successfully according to the project plan. The outcome of the hydraulic scissors lift design meets the objective of the project. As a result, the project designed the electro-hydraulic parallelogram lift. The general section described the classification, purpose and technical characteristics of the lift, and the mechanism and operation principle of the designed Lift.

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## REFERENCES

1. Christopher S. Pan, A.H., Michael McCann, Mei-Li Lin, Kevin Fearn, Paul Keane, Aerial lift fall injuries: A surveillance and evaluation approach for targeting prevention activities. *Journal of Safety Research*, 2007
2. McCann, M., Deaths in construction related to personnel lifts, 1992-1999. *Journal of Safety Research*, 34, 507-514.
3. Riley, W.F., Sturges, L.D. and Morris, D.H., *Mechanics of Materials*, 5th Edition, 1999, John Wiley & Sons, Inc., United States of America.
4. Material Handling Industry of America (MHIA), *Safety Requirements for Industrial Scissors Lifts*. 1994, Charlotte: ANSI.