REVIEW ON DESIGN AND FABRICATION OF AUTOMATIC RAILWAY RAMP

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ABSTRACT

This paper gives the concept on design development of "Automated railway ramp" based on pneumatic system. The system mainly focusing on stair mechanism for railway passengers to avoid any accidental falling between the train door and platform. The design modeled by using CATIA V5 and it has analytically analyzed by using pneumatic terminologies. The designed based on the principle of pneumatic system with single stage double acting cylinder. The compressor has not attached instead a pressurized cylinder of capacity 50 bar has used. The material used for the project is metal sheet, angles, pipe and telescopic guides. The fabrication of the system is up to prototype level as it requires government authority to implement in reality so it is manufactured on the basis of conceptual idea.

Keyword: - *Railway ramp, Pneumatic system, Telescopic guide etc..*

1. INTRODUCTION

The term Pneumatic is resultant from Greek term "Pneum" which resources air. The pneumatic system looks like the hydraulic system in construction but the applications are imperfect due to hydraulics, it is a fresh and arranged system. A pneumatic system is a system that use the compressed air to transmit and control energy.

Automatic Railway Ramp easy to get in passenger and goods in safe way from platform to railway bogie. It also insured the safety of passenger over the station were too much rush involved. The ramp is design in such a way that it exactly fits just under the floor of bogie exactly under the frame of door so that ramp could easily expand and contract in telescopic way. We intend to design and fabricate an automatic railway ramp that uses compressed air pressure as a source to power a pneumatic single stage double acting actuator, which in return set the ramp in motion by the means of pneumatic power. The existing air compressor in railway which is used for braking system will also supply compressed air for pneumatic actuator. The ramp open in telescopic way in three stages, whereas one is stationary and two are in moving form. Telescopic guide is attached to ramp so that it can move in and out easily

A survey is done to nearest Wardha Railway Station to identify the various problems existing in railway to the passengers while travelling from one station to another. General problem while travelling in railway seen is accidents. By railway various ways accidents can happens while travelling. Many accidents can be took placed by persons collapsing from train due to slippage, also due to slippage of person from door staircases and directly met with accident may cause to even death, another is train rulers are not properly checked before living the train from station, etc. Considering the main problem of slippage of person from staircase of bogie door, a new Mechanized concept is put forth i.e."Automated Railway Ramp", which runs on pneumatic system and telescopic ramp. This can be reduce the accidents and improve the safety factor taken under consideration in railway system.

1.1 Problem Statement

- Railway is one of transport vehicle worldwide used for public transportation purpose. Lakhs of people travels everyday by trains to various cities-states , across cities for various purpose.
- Passengers demand more comfort in travelling.
- The identified problem in railway is regarding to that of travelling of peoples, mostly when railway starts and stops at various stations.
- The most identified problem is entering and leaving of railway by passengers, as the mob of peoples trying to enter in railway by various way.
- In such mob, pregnant women, small children, senior citizens, personality disable persons, heavy carriage of luggage people, such peoples are mostly affected.
- Train bogie entrance and leaving of train, staircases are designed which are almost aligned to that of train.
- Hence, people cannot easily enter and leave the train ,also loading and unloading of luggage can be done easily.

Fig.1.1.Railway door staircase view.

Fig.1.1 Railway door staircase view.

1.2 Objectives

"Automated Railway Ramp" is one of simple concept is put forth through this project. Here the telescopic ramp is used in railway in alternatives to staircases. This telescopic ramp which is used here runs on pneumatic system. The main objective of this project is that, the alternative which is used here is ramp, easy to use for walking from platform to the railway door. Safely the overall loading and unloading of passengers as well as luggage must be done. Reduction in accident will takes place. The thesis objective is quite straight-forward , the concept which put forth in front of all the viewer's is that, everyone must known about this concept. In future it may be a need to apply such easy system in railways under the safety regarding of peoples, as population increasing day by day, the public transport will be use large in number. Hence, the project is placed in front. In future, it can be apply in Indian Railways System to improve their system regarding to safety category related to the passengers.

2. CONSTRUCTION AND WORKING PRINCIPLE

A pneumatic system is a system that uses compressed air to transmit and control energy. Pneumatic systems are used in controlling train doors, automatic production lines, mechanical clamps.

2.1 Main pneumatic components

Pneumatic components can be divided into two categories:

1. Components that produce and transport compressed air.
2. Components that consume compressed air.

The production and transportation of compressed air

Examples of components that produce and transport compressed air include compressors and pressure regulating components.

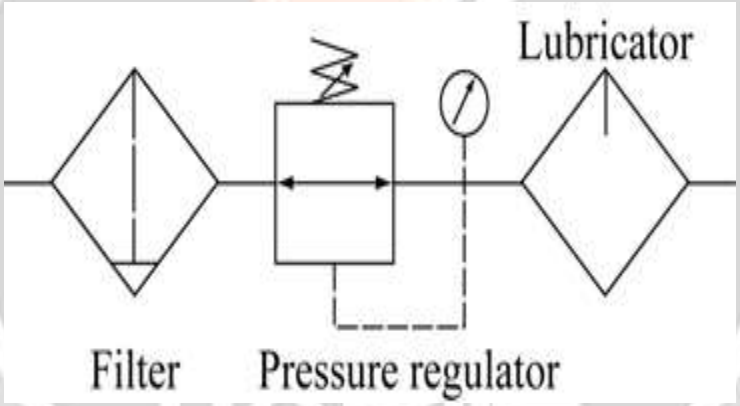
(a) Compressor

A compressor can compress air to the required pressures. It can convert the mechanical energy from motors and engines into the potential energy in compressed air. A single central compressor can supply various pneumatic components with compressed air, which is transported through pipes from the cylinder to the pneumatic components. Compressors can be divided into Two classes: reciprocator and rotary.

(b)Pressure regulating component

Pressure regulating components are formed by various components, each of which has its own pneumatic symbol:

(i) Filter – can remove impurities from compressed air before it is fed to the pneumatic components.
(ii) Pressure regulator – to stabilize the pressure and regulate the operation of pneumatic component.
(ii) Lubricator – To provide lubrication for pneumatic components



(Fig. 2.1 :Pneumatic system Componenets)

3. APPLICATION:

- To reduce the accidentals rate in railway which happens mostly due to staircases, in which people sometimes lost their lives.
- Ramp is one of track through which people can walk easily without any trouble, can travel safely from one place to another.
- Also goods can easily be loaded and unloaded on platform without any trouble, any harm to precious goods.

4. FUTURE SCOPE :

- Sensor actuator are use in ramp, which sensing human weight.
- Hydraulic system can be also used for actuating ramp
- All platform get standard in same height

5. CONCLUSION:

It is observed that, instead of staircases in railway the telescopic ramp is used, which is quite safer than that of staircases, as it reduces no. of accidents. To run the telescopic ramp, the pneumatic system is used. The pneumatic system here used quietly preferable, as the air which is used here is form the same railway. Hence, system works in dual mode.

Our main objective is to reduce the accidental cases, a person and also the goods must travel safely while entering and leaving the railway.

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