

# Two Axis Movement of Portable Platform for Material Handling

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## ABSTRACT

Basically in industries or any market Workers who load, unload and distribute construction materials may face hazards from lifting and carrying Lifting heavy materials while loading, unloading and distributing construction materials can cause injury to muscles, nerves, discs and ligaments of the low back[8]. While loading or unloading they slides the material which may lead to damage of material[3].

In our project we are going to design a platform in which we can load material on it, we can rise it up and down we can move it through wheels and the main advantage is that we can we will be able to move the platform in horizontal direction also. Due to horizontal movement it will rest on the surface and material can be loaded or unloaded very easily. For horizontal movement we can going to use rack and pinion mechanism or slides, the main advantage behind the project is that it will make it much easier for loading and unloading of material on any surface[3]

**Keywords:** Portable platform, two axis movement, mechanical advantage, material handling equipment.

## 1.INTRODUCTION

In daily uses the transport of material from one place to another place, so many methods are adopted in such application. The Portable Platform will overcome the previous problem of rotation of the trolley[4]. The main problem in the existing trolleys and equipment is that to dump towards narrow spaces it is risky and hectic task; this requires more skilled man power and more space to scatter the material drained[1]. Such types of difficulties are overcome, if we use a Portable Platform which can lift and slides, enables to deliver the material towards narrow spaces and desired heights[5].

A Portable Platform has two directions. This can be operated with the help of mechanical power. The rack and pinions are used in order to operate the platform, so that the platform can slide, and also maintain height by rotating the spur gear over the rack gear. At the required position it is stopped.[9]

## II.LITERATURE SURVEY

Various studies have been made in different industries to indicate that the cost of handling alone accounts for about 20-25% for the total manufacturing cost[1].

Stock & Lambert told Materials handling makes production flow possible, whereas Groover highlights that despite its importance, materials handling is a topic that frequently is treated superficially by the companies and Chopra &Meindl told it gives dynamism to static elements such as materials, products, equipment's, layout and human resources. All the following thoughts are expressed in the year 2001[5].

## III.METHODOLOGY

**Step 1:- Identification of problem:** In day-to-day life electrical energy have evolved as one of the most basic needs of human being. We know that for material handling we need more human effort and need of more electrical energy[5]. Today we required material handling equipment which should be cheap and challenge to safe. To reduce material handling cost we choose material handling equipment for our project work.

### Step 2:- Design and Proposed Project: Duration (8weeks)

This phase involves the design of various elements such a Bearing, shaft & gear.The system design comprises of development of mechanism so that we give concept can perform the desire operation. The system design also determined system components, their shapes and dimension parts are designed according to standard formulae. And procedure as per reference the standard parts are selected from the design data book and procedure of design is selected from design of machine element by V.B.Bhandari[5].

### Step 3:- Software Modelling:

Detailed drawing using AUTO-CAD software, CREO. Designed part is drawing using AUTO-CAD.

### Step 4:- Fabrication:

All the designed elements are manufactured in the workshop such as frame, shaft as per design and also select the part as per specification for e.g. rack and pinion, support rod, chain and sprocket etc. Upper frame, lower frame, are manufacturing in workshop.

### Step 5:- Assembly:

All the manufactured and selected parts are assembled together.

## IV.CONSTRUCTION

• Following are the part names:

1. Iron bars
2. Rack & Pinion Mechanism
3. Portable Platform
4. Bearings

5. Rollers
6. Hand Lever



Fig.1 Actual Photograph of Flexible Trolley

- The main frame is joined by the process of welding.
- After that the Rack is connected to upper plate with the help of welding.
- It is aligned by the corner ruling plate.
- Then Rack is guided by the supporting rod with the help of bush.
- Pinion is mounted on the shaft which is horizontal.
- On the same shaft of pinion a chain & sprocket drive is also mounted which further transmit motion to wheel.
- After assembling the Rack & pinion the next step is to mount a return mechanism.
- Ball bearing are fitted for ease in sliding and for minimum friction between rails and bar end.
- Pedestrial bearings are also provided to hold lever connected to pinion

## **V.WORKING**

The movement of the platform is done in two different positions: Horizontal & Vertical, which is achieved by operating the Hand lever by manual effort.

Maximum Load carrying Capacity: 70 to 100kgs.

Whatever the material is to be moved is placed on the platform and to easily move it from one place to other, rollers are provided at the base of platform.

When the platform is loaded, the effort required to turn the lever is also increased, hence provision of bearing is made[6].

## **VI.ADVANTAGES**

- Easy in operation
- Minimized damage to material while loading and unloading

- Compact
- Minimized the work for labors while working
- Reduction in human efforts while material handling.
- Elimination of electricity.
- Increase efficiency and stability of plant
- It saves the time during material handling.
- Capital cost is low.

### **VII.DISADVANTAGES**

- For limited weight there is limited travelling of device.
- If damaged then there will be increase in down time.

### **VIII.CONCLUSION**

It works on the self-weight of job or object which has to be transfer from one machine station to other machine station without consumption of any type of fuel or electricity.

Hence this equipment is best suitable alternative for existing material handling equipment.

By the use of this type of equipment we reduce the energy consumption which also helpful for overall cost reduction[7]. The most important thing we conserving our energy sources which are much useful in future growth and development

### **IX.FUTURE SCOPE**

In our project if the operation of rotates of the platform or dumping the trolley is done remotely or even automatically by using the software technology and making the system total automatic. This will minimize the requirement of the man power and the function can be done continuously without any break and thus increasing the efficiency[2].

For the purpose of automation the sensor technology is used to notice the angle of rotation of the platform and even this position can be observed remotely through wireless technology is also possible.

PLC based operation of the pneumatic platform makes it more reliable. Thus we can make the system more flexible and sophisticated. Thus the platform are of high importance in industry.

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