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3 in 1 Multi-Utility Material Handling System

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Abstract - *The paper is related to the device which is designed to reduce the human efforts required to lift the load and easy movement of load, which reduces weight load effect on body of human who carries the sacks like labours or workers. This device converts the total point load acting on the users into uniform load.*

***Key Words*: Material handling, Load carrier, Manual equipment, labours.**

1. INTRODUCTION

Material handling refers to controlling discipline of movement, i.e. the handling and storage of material, during different stages of manufacturing. It is considered as material flow all the way through and out of the plant. It is a used to deliver the goods safely, to the right place and time and at the minimal cost.

Materials are located, relocated, unloaded, positioned, and kept in/taken out from temporary areas of storage. A good material handling practice involves the methodological and enhanced conduct of material handling activities to minimize as many movements as possible.

2. PROBLEM STATEMENT

- Labours carry the sack on their back which leads to the pressure on their spinal cord.
- They carry the sack by folding their hands in backward position which leads to pain as well as chances of getting the bone shifting.
- They also have many problems in knee in early age due to load which they are carrying is not balanced.
- Due to point load acting in some of the body area they are getting pain.
- Due to heavy lifting load labours face problems like Osteoarthritis, abnormal spine alignment, Spinal bone diseases and Rheumatoid arthritis.

3. TECHNIQUE

Our project agenda is to reduce the point load and distribute load in the body of the load carrier person equally and also maintain the center of gravity so that the various problems faced by labours will be minimized. So we started case study on the labours we observed them and got some points for designing of our project.

4. INNOVATION

Number of equipment were available for lifting load on head on back and a simple trolley, so we came up with a combined idea which can fulfill all these uses . We developed a new product which can be used for many purposes that too cost effective.

5. CONSTRUCTION

The constructional elements of 3 in 1 multi utility material handling system are as follows:

- Square pipe
- Round pipe
- Wheels
- Knob and bolt
- Handle
- Cushioning

Square pipe is used in device for making frame of the device which is used almost for the structure. Round pipe is used for making the handle by bending the pipe. Knob and bolts are used in the project for fitment of two different parts of the frame. Wheels are attached only for movement of device.

6. WORKING AND USES

We wanted our project to reduce stress concentration of load on the back of labours. The main aim of designing is that to reduce the point load and distribute the load on the whole body.

When we will load sack on the lower frame it gets supported by the vertical frame and can be used as a simple trolley. While considering load on back and on head all the load is directed on the shoulder which is cushioned and will lead to surface load on the shoulder. Making the job such that CG should be maintained perfectly which will distribute the load efficiently all over the body.

7. VISUALS OF EQUIPMENT

Simple Trolley

Load Carrier on back

Load Carrier on head

Simple Trolley

Load Carrier on back

Load Carrier on head

8. APPLICATIONS

Main application was for the labours we can have many application of this basic material handling system just by some changes according to applications.

The following more application includes-.

- Sand carrier (making complete seal).
- Bricks carrier.
- Fertilizer sack carrier
- Trolley applications
- Cement bowl carrier

9. ADVANTAGES

- Improve company image and competitiveness
- Improves the quality, reliability, of a product/process
- Increase user satisfaction
- Maximize profit
- Minimize late changes and associated cost
- Reduce system development time and cost

10. COSTING OF PRODUCT

- Square pipe - 160
- Pipe bend - 50
- Knob and bolt – 40
- Wheels – 60
- Handle – 30
- Powder coating – 30
- Welding – 60

11. BENEFIT OF PRODUCT TO SOCIETY

Repeated lifting or a sudden movement can strain back muscles and spinal cord. If person lift a load, constant stain on a back can cause pain in muscle. This is observer where frequent loading and unloading of goods is done by workers. Some of the most commonly observed back problems are osteoarthritis, abnormal spine alignment, Spinal tumor, certain bone diseases, Rheumatoid arthritis this equipments helps overcome this back problems.

CONCLUSION

3 in 1 multi utility Material handling system is low cost device. It reduces fatigues of labour. It reduces spinal cord pain by distribution of the load. It reduces stresses on human body. It can be used for easy transportation of material or goods. By some simple change it can be converted to load carrier on back and load carrier on head. As compared to direct loading of sacks on back or loading weight on head this equipment gives effective results. It is also cost effective device. Hence 3 in 1 multi utility material handling system turns to be human friendly equipment.

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