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Design and Fabrication of Barrel Lifting Machine –A Review

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***Abstract*:** *This paper presents the use of drum handling equipment in the industries to reduce worker for drum handling. The study effect of material handling on human is done in this paper. Also study different material handling equipment used in industries. In today's fierce competitive global markets, customers are demanding adjustable sizes, higher quality, and flexibility: in short, they want it all. In order to stay competitive in the market, companies need to attain both customer satisfaction and cost reduction in production operations. Material Handling Systems (MHS) is the place to accomplish this goal since they have a direct impact on production. The hydraulically operated drum lifter cum tilter is mobile on three wheels, two of which are steering types. The use of drum handling equipment in the industries to reduce workers for drum handling. Existing methodologies are manual, hydraulic system, and pneumatic operated machine. To minimize worker for Drum transporting, loading, unloading, lifting and tilting process. Material handling systems consist of discrete or continuous resources to move entities from one location to another. To improve operational efficiency, increase responsiveness, improve consistency and predictability, decrease operating costs, and eliminate repetitive or potentially unsafe manual labor.*

***Key Word*:** *Industries, Material Handlings, Material Handling Hazards, Adjustable sizes, flexibility, customer satisfaction, cost reduction, production* operations.

I. INTRODUCTION

Designing of lifting, pushing and pulling activities based on the physical and physiological capabilities of the operators is essential. The purpose of this study is to find a way to design and develop a material handling system (MHS) that works without affecting the routine of the operators, or the industry, while reducing the effort, time, and cost needed to transport materials through other means, while improving the overall work efficiency. They handle drum manually. In work place drum transported, lifted, Loaded, tilted etc. manually. Handling heavy load manually takes more time, worker also it is hazards and risky. In small pharmaceutical company around 25 different type of raw material use. It is in liquid form which is taken out from 210li. By analyzing our findings from the study, we started to identify problems and challenges to be faced by such a material handling system from an industrial perspective. Thereafter we modified our design for the first time to accommodate industrial floors. Such changes would be done throughout our journey of designing an optimal Material Handling System. To conclude, our research looked at the material handling and transport system design problems from an industrial point of view and solved them by adding human and management angles to design steps involved, thus developing a simple system capable of being driven by unskilled workers to lift and move heavy loads in short times, with minimum effort required by the worker. Drum by loading on horizontal stand. Company cannot use barrel pump because it will require maintaining 25 barrel pump which is costly. In automobile work shop require around 8 type oil for vehicle which comes in 210lit. Company requires effective material handling equipment for effective material handling. Manual drum handling equipment is use to do various function like transport, tilting, lifting, loading, unloading etc. In small industries or work shop drum barrel is handled manually which takes more time and more worker. Handling drum manually without using any equipment is hazards.

II. OBJECTIVES

The objectives of our research are listed as follows:

- To alleviate the efforts required by workers to transport bobbins
- To reduce the time required in the completion of a work cycle in an industry.
- To reduce the costs associated with a work cycle at an industry.
- To improve the work efficiency of the industrial grounds.
- To minimize worker for Drum transporting, loading, unloading, lifting, and tilting process.
- To study material handling equipment for Drum handling.
- To study the lifting and loading effect on humans.
- To study thergonomicsic of material handling.

- To design a modified drum tilting mechanism.
- To fabricate a prototype model. Testing and conclusion.

III.LITERATURE REVIEW

Literature review areas of research considered in the past, to be explained the approaches used & the new ideas. It is an assignment of previous task done by some authors and collection of information or data from research papers published in journals to progress our task. It is a way through which we can find new ideas, concept. There is lot of literatures published before on the same task; some reference papers are taken into consideration from which idea of the project is taken, the other reference will we discussed later.

We relied upon the following research papers to understand the scope of our research:

- Design and Fabrication of Drum Handling Equipment – A Review, by Nilesh K. Garghate, KDKCE, Nagpur.
- Modelling and Design of a Direct Drive Lift Control with Rope Elasticity, by S. Bolognani, University of Padova, Italy.
- Torque Balanced Wire Rope, by W. Lucht And F. Doneckar, SAE Technical Paper.

IV.RESEARCH METHODOLOGY

The research methodology will cover follows.

- Sufficient literature related to manual drum handling equipment is available.
- Initially effect of manual handling of loading, lifting, transporting etc. on human being is studied from the available literature.
- Existing machines for manual drum handling equipment will be studied thoroughly.
- Advantages of drum handling equipment using in pharmaceutical industries and automobile work shop are studied.
- Ergonomic of material handling be studied.
- Design of modified drum tilting, rocker(stacker) mechanism will be made.
  Simulation with help of software will be made. Also modified fabricated model will be prepared. The conclusion and future scope of work will be discussed in the end.

V. PROBLEM IDENTIFICATION

- The problem of taking out a different type of chemical (around 25 types) from Drum in Pharmaceutical industries.
- The problem for Loading of oil barrel on the rack in compact space at Automobile workshop.
- Reduce worker from 4 to 1 to doing work of Drum tilting.
- The problem of Back pain while lifting load.
- The danger of Muscular injury while handling drum manually.
- It should be non-reactive to the chemical used in the company.
- Limitation of safe load lifting capacity for humans.
- There is no proper holding arrangement end on the drum.
- There is a lot of manpower and time that goes into the transportation of industrial bobbins weighing from 50 kg up to 200 kg gross.
- Industrial grounds are not spacious enough to accommodate conventional transportation systems like crane carriers or trucks.
- Other transportation systems (like gantry cranes) use too much power and hence can not be used multiple times throughout the day, especially not for transportation of relatively smaller items.
- New innovations to tackle such problems may require skilled personnel for operation, and training workers to operate such a machine would take a lot of time and money.
- Solutions may also require the industry to modify its layout to accommodate the solution, which would cost a lot of money and time for the industry.

VI.CONCLUSION

The main conclusion will be drawn to find out whether it is possible to automate a skilled manual process that would avoid worker fatigue. Also, the future scope for developing the generalized mechanism for any profile can be identified.

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