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"A STUDY ON MANUAL STACKER TRUCK"

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ABSTRACT

Forklift trucks are essential tools for manual pallet handling. Storage heights at high rack storage areas often reach up to 12 meters in which bulky Cargo can hide the view of forklift operator. Pallet recognition is a fundamental issue for Industries & warehouses, Particularly, a pallet recognition approach is presented to recognize pallets in the warehouses, based on calculating the degree of similarity at each location of the palette. In this thesis, study has been carried out on the manufacturing process and functional activities of Manual operated pallet truck and came across with the various problems and handling in the current system. After thorough studies, careful static analysis and reviews of the various manufacturing systems and technologies. Manual Pallet Truck are robust in construction and are smooth in operations. Manual Pallet Truck are able to work efficiently for pallets on high rack, smooth control of precise lifting and lowering. By this project man power effort and time can reduce.

Key Words: *Manual Pallet Truck, manufacturing, pallet, lifting, high rack.*

I. INTRODUCTION

Material handling (MH) involves "short-distance movement that usually takes place within the confines of a building such as a plant or a warehouse and between a building and a transportation agency."[1]It can be used to create "time and place utility" through the handling, storage, and control of material, as distinct from manufacturing (i.e., fabrication and assembly operations), which creates "form utility" by changing the shape, form, and makeup of material. A "manual pallet stacker" typically refers to a piece of equipment used in warehouses, factories, or other industrial settings to lift and move pallets without the need for powered or motorized mechanisms. It's designed for tasks that require vertical lifting and positioning of pallets or heavy loads.

Here's how a manual pallet stacker generally works:

Design: A manual pallet stacker consists of a frame with two forks that are used to slide underneath a pallet or load. The forks are connected to a lifting mechanism.

Lifting Mechanism: The lifting mechanism can vary, but it's often operated manually by using a hydraulic pump or a mechanical lever. When the operator activates the lifting mechanism, it raises the forks and the load vertically.

Lifting Height: The lifting height of a manual pallet stacker is limited compared to powered alternatives. It's suitable for lifting loads to a certain height, such as placing them onto shelves or loading them onto trucks.

Manual Movement: Manual pallet stackers are usually moved manually, either by pushing or pulling the equipment. Some models may have wheels for easier maneuverability.

Applications: Manual pallet stackers are commonly used in situations where powered equipment isn't practical or necessary, or in cases where a lower budget is a consideration. They are often used in smaller warehouses, retail

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settings, or locations where space is limited.

Load Capacity: The load capacity of a manual pallet stacker varies depending on the model, but they are generally designed to handle moderate to heavy loads.

It's worth noting that while manual pallet stackers can be effective for certain applications, they do require physical effort from the operator. For heavier loads or more frequent use, powered pallet stackers or forklifts might be more suitable options.

Keep in mind that my information is based on the state of knowledge up until September 2021, and there might have been developments or changes in manual pallet stacker technology since then.RegenerateThe value (to the customer) added by the overnight delivery of a package (e.g., Federal Express) is greater than or equal to the additional cost of the service as compared to regular mail service—otherwise regular mail would have been used.

The value added by having parts stored next to a bottleneck machine is the savings associated with the increase in machine utilization minus the cost of storing the parts at the machine.

Electric Pallet Stacker is a thin, highly-versatile lift that compliments nearly any primarily indoor application. Balanced similar to a traditional forklift and without base legs, the Counter-Balanced Electric Stacker can fit into tight spaces. Extremely durable and budget friendly, the Toyota Counter-Balanced Stacker can help increase both your uptime and your bottom line.

Fig.1 stacker

II. LITERATURE REVIEW

VamsiKrishna and Porchilamban created and in a general sense separated a twin impact stacker masthead for better efficiency Bulk material taking care of expects a fundamental part in the incredible activity of process organizations. In Visakhapatnam steel plant is one such shore based process industry working at 120% of assessed breaking point of 3.0 MT/annum. Liquid steel is developing its capacity to 6.3 million ton for each annum, around 24MT/annum of mass materials are to be taken care of in Visakhapatnam steel plant(VSP).. The trustworthiness of the twin impact stacker is most outrageous fundamental for stacking the materials in the capacity yard for better coordinations. The developing of twin impact stacker with the deferred activity achieved lopsided loads or shocks on MAST HEAD. This has achieved standard frustrations of MAST HEAD. The arrangement adjustment has been confirmed by exhibiting the MAST

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HEAD using SOLIDWORKS Version 2012 and separated using FEM group ANSYS 14.5. The Necessary pressure sustaining has been made considering the preliminary assessment by growing the thickness of the spacer and watched that the nerves are inside quite far and are discussed in the subject RESULTS. In this manner the arrangement has been set and the created drawing has been discharged for execution.. [1]

Sivasubramanian et al arranged a change to the customary self-loader stacker using CAE The crucial purpose of this paper is to plot and change stacker component for a seal pressing machine. In a direction producing association, stacker systems are critical sorts of stuff used to manage materials which are in mass for example seal, confine, etc. Seal pressing machine is used to put the seal on the bearing which shields the bearing from outside particles and shields the oil from spilling. The recurring pattern stacker system being used is a single stacker structure in which only 60 seals can be set at once which gets over shortly. So a framework is required which can oblige more seals with the objective that the reloading time increments from 10 minutes to 2 hours. For such an explanation, more stackers would be required and in this manner such a structure would be known as a multi-stacker. By using a multi-stacker instrument the man/machine association is reduced, specialist shortcoming is decreased, machine sit without moving time is decreased and general adversities are lessened.. [2]

Vianen et al developed a reproduction device to reschedule the stacker-reclaimer assignment to enhance efficiency of a dry mass terminal. They accomplished vital decrease in holding up occasions of cargo trains at the mass burden terminals. [3]

Miao et al developed an entry stacker multi put together fork exhibit using Pc upheld plot. They enhanced the stacker security and trustworthiness using transient amazing assessment in Ansys. [4]

Sahu and Bhatele contemplated the execution of a stacker-reclaimer over long detachment drive activities. [5]

Tian and Hu improved the turn point position of luffing framework in a compartment achieve stacker. The luffing instrument of achieve stacker is the center of huge arm lifting component. The turn point position in it impacts specifically the far reaching displays. The numerical model of three turn focuses was developed through the force examination of luffing instrument, which plans to reduce the best force of hydro-chamber and decreasing the oil weight of pressing factor driven structure. A reformist mentioning procedure was utilized to enhance the multi-target issue. The enhancement computation was introduced by using the innate calculation in Matlab. Exploratory outcomes show that the smoothing out overhaul the broad execution of achieve stacker. Additionally, this similarly gives critical foundation to the boundaries plan of luffing component[6].

Xiao et al directed restricted component basic assessment of the trolly casing of a stacker-reclaimer running framework. Remembering the ultimate objective to design and improve the trolly edge of stacker-reclaimer running instrument, it is very useful and proficient to abuse ANSYS, which can ensure security just as lessen time and cost. The stacker-reclaimer is a typical constant and productive mass materials stevedoring and moving contraption on the planet, running instrument is arranged in base of the whole machine, which expects a fundamental piece of supporting the machine and the running capacity of the machine. Thusly, the security and unflinching nature of the running instrument is amazingly gigantic and basic in the protected activity of the whole machine. To guarantee immovability and hardness of the steel structure, it is done that the static assessment of the key portions the trolly layout by using restricted component examination programming. Through watchful examination and research, it exhibits that the arrangement of the parts meets absolutely requirements of certifiable conditions. The Finite Element Analysis of Trolly Frame of Stacker-Reclaimer Running Mechanism Based on ANSYS. [7]

Daniel et al inspected the resultant concerns in the pulley of a stacker-reclaimer. The essential purpose of this endeavor is to decrease the pressing factor circle back to the post. This endeavor prompts the pressing factor improvement of the shaft. By creating a center plate we diminished the pressing factor created on the post. Along these lines, that there is increment in shaft life. By applying distinctive thickness of the center plate we increment the existence of the shaft. There is an opportunities for decreasing the greatness of the part by using light weight material. The load allotment on the shaft is even with the supporting circles. Thusly, that we reduce the total burden circle back to the specific contact on shaft. The essential portions are shaft, plate, barrel, and center. Sketching out units of this sort requires exact counts

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of all piles in static conditions. In this paper the part cross region was explored. The pressing factor assessment using ansys is performed on the cross territory of get together of the reclaimer pulley considered as a sort of perspective for the current diagram and despite for the changed plan which is the essential endeavor of this endeavor. The cross portion of the model was examined with the clear stacking conditions. With that the barrel avoidance is restricted in the cross section assessment [8]

Singh and Parikh executed restricted component assessment to diminish stacker weight by considering the tensions circling back to the stacker base plate. Nevertheless, they didn't absolutely plot another multi stacker structure for enhancing efficiency. In a course producing association, stacker systems are fundamental sorts of stuff used for taking care of mass materials. In this work, another multi-stacker plan has been expected to replace a customary bearing seal stacker structure. The new system can oblige 720 seals out of the blue. This course of action extended the time opening between two stacking cycles to upto 2 hours when contrasted with just 10 minutes in the more settled arrangement. In like manner, the ordinary machine sit out of stuff time was decreased by more than 85%. This achieved an efficiency redesign of over 7%. Along these lines, a multi-stacker framework shows exceptionally supportive to decrease man/machine connections, specialist fatigue and machine stand by circumstances in the bearing industry seal crushing machine benefit. [9]

Syed Sajid Ahmad Syed Nisar , Prof. K. I. Ahmad Prof. M. Sohail Pervez associated with quickly creating mechanical age each industry needs speed in gathering to adjust up to client's necessity. The fundamental objective of this endeavor is to develop a base weight and insignificant exertion current beds for taking care of engine squares. From this we accomplish quicker transportation. Material managing is an exceptionally wide purpose of science talk, consequently the key idea behind developing such an arrangement to show the circumstance of beds use in ventures and related influencing factors. The last model is a mix of systematize process and the ease ideas.[10]

P. Naveenkumar et. al In today life there is wide of fork lifts assortment of forklifts from the huge substantial loadings trucks to the one that works among slender passageways forklifts have gets one of rudiments transportation devices we use in our lives with all the forklifts in presence we find that there are some improvement that can be to carry forklifts to the better exhibition. Segway is a self-offsetting transportation gadget with two wheel can work in any level person on foot climate. Existing forklifts configuration has its constraint in turn and constructions has potential danger our new plan as 90 degrees pivoting forks connected to truck body on the two finishes .additionally it has a scissor lift under the administrator lodge which improves the dependability fork ;there is a sum of 8 sections in the new plan Once the plan is considered, we ascertain the mass properties of parts and subassemblies to guarantee the security of the fork lift results show that truck is protected to utilize its focal point of gravity stays in the wellbeing triangle and we utilize this to get the greatest stacking limit then we run pressure examination significant parts and subassemblies utilizing limited components Method (FEM) and their outcomes show that the new plan is protected to use under working condition. [11]

Anil An et. al The Battery Operated fork lift is an improved form of lifting and conveying the heap which should be moved starting with one spot then onto the next. This cutting edge innovation has gotten another upheaval the mechanical ventures and most generally utilized in weighty Engineering organizations. These forklift vehicles had upset product lodging rehearses utilized in the twentieth century. For quite a while, self-loader kind of material giving frameworks being utilized. In self-loader material taking care of, the framework was physically controlled. The plan of forklift has altered stockroom work and it is practicable for one individual to move many kilograms on the double. These all around kept up and securely worked forklift has made lifting and moving load things without any problem. The fundamental reason for this paper is to plan and manufacture a forklift machine which is new and unique in relation to existing plans. This planned forklift utilizes a battery-powered battery which implies it is controlled totally by power. From the plan of forklift, it tends to be reasoned that this machine is fit for lifting a heap of 100 Kgs. The discoveries of this exploration show that the planned machine can be utilized in limited scope enterprises. [12]

Khebude Karan N et al This Paper manages the Design and Static underlying examination of forklift Fork utilizing ANSYS R16.0. The Design Calculations of Fork are contrasted and Structural Analysis Report. The Lifting of Fork makes the Deformation and twisting of fork. Because of determination of forklift material as gentle steel it has

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expanded the benefits of configuration because of its high explicit firmness and strength. This paper gives answer for hypothetical calculations.[13]

III. CONCLUSION

Various researchers have worked on stacker design and its work can be extended by using different materials and in future we can do work on stacker machine with composite materials and optimize weight, cost parameter.

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