

DESIGN AND DEVELOPMENT OF LOAD TRANSFER DEVICE IN FARM ACTIVITIES TO AVOID BACK PAIN ISSUES

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ABSTRACT

We are moving towards a more convenient and time-saving method, which is why many engineers work on multiple innovations to simplify processing and save time. In this project, a device for lifting and transporting heavy objects will be developed. simple. Flat paths, as well as on the stairs. The demand for this system stems from the daily needs of agriculture and our society. Use trolleys and other equipment to reduce the pressure when lifting heavy objects from high places and level ground; however, when transporting goods through a small group of ladders, this equipment usually does not work. This is why a ladder truck was developed in the project, which can be more than manual Transport more effortlessly to move heavy objects up the ladder. ... He also tried to investigate the commercial viability and importance of this product. Various designs have been developed to enable non-industrial trolleys to climb stairs, lift loads, curbs or uneven terrain, thereby reducing user stress. In our project, the trolley is equipped with TriStar wheels and helical gears and helical gears, which can lift the load, go up and down the stairs, and move the trolley on uneven surfaces such as potholes, potholes, and potholes more easily. and many more.

Keywords: Easyhandling, timeconsumption, relievestress, farming

I. INTRODUCTION

A typical trolley consists of two wheels located at the bottom of the trolley. Two handles are provided for fixing the frame and applying human force. The size, shape and position of the handle fully meet the requirements. The wheels are mounted on shafts supported by bearings. Professional freight forwarders prefer to use trolleys when transporting stacked items (such as boxes, cages or sacks). The user of the trolley must be careful not to stack the trolley too high to avoid obstructing or obstructing the load. Unstable. A trolley is a small vehicle used to move heavy objects from one location to another. It is a very common tool used in various industries to transport physical objects. Also called trolley or trolley. Usually used by people who store and replenish merchandise in retail stores. If used properly, trolleys can protect people from back injuries and other health problems caused by lifting heavy objects. The trolley is made of stainless steel, suitable for heavy loads, and structural steel is suitable for medium loads. The cart is designed to lift heavy weights with less manpower. In farmland, it plays a weightlifting role and can be used by farmers, especially when someone is injured at this time. Lifting loads with this type of trolley is very easy to use. This ladder trolley is one of the easiest

vehicles to use. It requires less manpower and does not require an external power source to operate the trolley and move on the ground, even if the road is rough and uneven.

I. LITERATURE SURVEY

There changed into lots of associated paintings & studies achieved withinside the shape of literature survey to gather the knowledge & abilities wished to finish this challenge. This led us to stumble upon numerous challenge paintings, thesis & technical papers observed with the aid of using numerous opinions given on them. We can be discussing a number of the papers & the paintings achieved in them & then reviewing with the aid of using evaluating them to our challenge paintings.

AUTHOR	KEY FINDING
Pratik H. Rathod	designed and fabricated a hand truck which climb stair with less effort which is useful for library, hospital, regular goods carrier etc. the main modification in this truck where made at wheels using plat surface roller plat attached instead of traditional wheel frame. The mechanism based on retched arrangement mechanism. The maximum bending moment was calculated. The inclination of 44 degrees plays a major role which covers more than 90% of all stairways within this limit. There is an optional maximum inclination warning alarm that alerts the operator of an inclination of more than 44 degrees. When truck operated with exceeding the limit there should be taken the necessary safety precautions
Roshan Alaspure	designed AND fabricated a Stair Climbing Wheel Mechanism which can be considered as Alternate for lifting goods in such a way that it can be climb a stepped path with its modified wheel structure using manual metal arc welding (MMAW) or stick Welding. An electric current is used to strike an arc between the base material and consumable electrode rod or stick. The electrode rod is made of a material that is compatible with the base material being welded and is covered with a flux that gives off vapors that serve as a shielding gas and provide a layer of slag, both of which protect the weld area from atmospheric contamination
Raj Kishor Kumar	investigated on stair climbing functionality is embedded in the design through its structure and mechanism. The product mainly consists of modules viz. seat, links and frame. Anthropometric measures are considered in the dimensioning of seat. Focus is laid on different parameters such as form, functionality, technology and architecture of the product. The design is validated by developing Digital Mockups of individual parts are generated in PRO-E Creo software and are assembled to form the final product. Necessary simulations of the

	<p>product are generated in virtual environment of PRO-E Creo software. The physical and focused prototype indicating the structure and functionality is developed using thermocol material. Here wheel carriers are made in RP (Fused Deposition Modelling) using ABS (Acrylo Butadiene Styrene) material. Wheelchair is embedded with some additional features like integrated commode facility, after gathering costumer requirements from different subjects</p>
Md. A. Hussain	<p>designed and manufactured a stair climbing vehicle using modified form of frame arrangement i.e a curved wheel frame which move on rough surface. To address several technical issues in designing this vehicle is stability and maintain high speed at vehicle wheel arrangement while climbing stairs. The frame arrangement consists of sun, planetary, idler wheel which are assembled to the shaft which reduces application of load. However, the steepness of the stairs is also the important concern of this study. The vehicle has four set of wheels arrangement to support its weight when it moves over the flat terrain. Each wheel frame consists of three sub-wheels attached with the sun wheel through three idler gears</p>
Ashish Singh	<p>worked on four-wheeled robot will have the capability of climbing the stairs of height equal to its diameter. It will possess maximum gripping capacity and stability during motion in rough terrain owing to the 4 differential driven wheel configurations. The main goal of this investigation involved within this project such as the robot should be upgradeable with a variety of application sensors, e.g. cameras, thermal vision, or chemical sensors. To be usable in any search and rescue or security application, the robot has to be operational without changing batteries for at least two hours</p>
P. P. Gondole	<p>fabricated a stair climbing hand trolley with proper dimensions of Height 4 feet, Lower frame 38 X 38 cm, Length of each arm of trigonal wheel axial geometry 15 cm, Diameter of shaft 15 mm. The major components used to fabrication process are square bar cast iron pipe, Round bar shaft of SAE 1030, rubber rest, caster wheels (industrial rubber), iron plate, long guzzon pin. Mathematical calculations are made to this work to exhibits expected results and carried load across the stair very easily thus climbing across stairs transportation of goods very easily</p>
Kunal Kotian	<p>(4PA07ME029) Rao Sharana Kumar (4PA08ME402) Srinidhi (4PA07ME057) Abdul Rahiman (4PA08ME400) Under the guidance of, Mr. HEMANTH SUVARNA Material handling is defined as “the movement of raw material, semi goods through various stages of production and ware housing”. It is concerned with the movement, storage and control of materials in a production process. This project is</p>

	<p>about providing small scale industry which are dominant in India with custom designed fork lifts of variable capacity where the operating cost and maintenance is just negligible hence economical and efficient. Since the whole operating is purely manually or mechanically through cycle pedalling</p>
<p>Gaffar G Momin</p>	<p>found that design as well as analysis of a hydraulic scissor lift. Conventionally a scissor lift or jack is employed for lifting a vehicle to change a tire, to gain access to travel to the underside of the vehicle, to lift the body of the vehicle to appropriate height, and lots of other applications also such lifts can be used for various purposes like maintenance and many material handling operations. The lift can be of mechanical, pneumatic, or hydraulic type. The design of the lift described within the paper is developed in such a way that the lift is operated by mechanically means by using a pantograph such that the overall cost of the scissor lift is reduced to some extent. In our case, we required the lift is portable and also works without consuming any electric power source so they decided to use a hydraulic hand pump to power the hydraulic cylinder Also a such design can make the lift more compact and much suitable responsible parameters were analyzed to check the design of the lift for medium scale work. Finally, the analysis of the scissor lift was done in ANSYS and also all</p>
<p>Uttam Panwar</p>	<p>stated that operating mechanism and study of hydraulic lift. This research paper solves material handling and provides comfort to the operator. This paper shows the study and also the design of hydraulic scissor lift components. It can lift up 300kg of load with a raise of 3.5ft. The main aim of this research paper is to study the hydraulic scissor lift also design and fabrication of hydraulic scissor lift. In this case, lift has to be movable and portable so rollers or wheels are provided for motion at the bottom side of the lift and also we can't use electric power in this lift so they use a hydraulic pump. Hydraulic generate more and accurate pressure. By use of this mechanism and design hydraulic lift became more efficient and can operate in industries. The purpose of this research is to use all components effectively gives good results</p>
<p>N. Pandit</p>	<p>studied the design, analysis, and safety requirements of the scissor lift. It is a versatile material handling equipment that can use hydraulic, pneumatic, or mechanical energy as input for its working. For designing, forces can be calculated by considering the equilibrium of the system at both the positions, closed and open. The various attachments can be added to the equipment which ensures the safety of</p>

	the worker operating it and gives the guidelines for handling the unit
Sandeep G. Thorat	found that Hydraulic scissor lift is designed for high load resistance. Scissor lift is easy to use and daily maintenance is not required. Mild steel is selected for the manufacturing of scissor lift because it has greater durability, strength, easy and cheap availability. For the given dimensions of the scissor lift, it can lift a load in the range between 3000 to 4000 kg up to the height of 7ft. The lift provides plenty of scope for modification for further improvements and operational efficiency
Georgy Olenin	studied that the design and analysis of scissor lifting platform for both for the highest and lowest position. Also, the working principle of scissor lift and types are discussed in this paper. Along with design the faults occurring during the operation of the scissor lift and their methods of elimination are provided to improve productivity. Design calculations are carried out by using concept of free body diagram and slandered formulae. In this paper numbers of cases are given for cylinder mountings which depended on the angle of hydraulic pressure system, for lifting of a vehicle in garages, maintenance of huge machines
M. Kiran Kumar	concluded that force is also acting on the hydraulic scissor lift when it is extended and contracted. Generally, a hydraulic scissor lift is used for lifting and also holding heavyweight components. Material selection plays a very important role in designing a machine and also influence on several factors such as durability, reliability, strength, resistance which finally helps to increase the life of scissor lift. The hydraulic lift design such a way that it must be portable, compact, and more suitable for the medium type of load handling application. Drafting and drawing of the hydraulic system of a scissor lift are done using solid works software with suitable modeling and imported to Ansys workbench software for meshing and analysis of lift. Hence, the analysis of this scissor lift includes Total deformation load, and Equivalent stresses were done in Ansys software and all other responsible parameters of the lift were analyzed to check the compatibility of the design value. The

	<p>computational values of two different materials such as aluminum and mild steel are also compared for the best results</p>
<p>Suhas B. Bhalake , Amit Gade, Akanksha Sonawale,Nilesh Bhaskar, Rishikesh Dhamane</p>	<p>Lift may be a very simple device used to raise elements or objects or load from ground level to a specific height to perform a particular work with maximum load capacity and minimum efforts of a worker. To achieve this we required the higher strength material, hydraulic components such as hydraulic cylinder, wheels, etc. all the researchers attempt to optimize these parameters according to the concerned requirement. In this review paper, it had been tried to think about different research papers containing the research and analysis made on scissor lift evaluated the design and analysis of hydraulic Scissor Lift. It gives a brief description of its types, working, system requirements and design methodologies. This review paper also focused on the analysis of some research papers containing the entire study of components (hydraulic or pneumatic cylinder, spacing shaft, and platform and scissor arm), selection of material, and analyzes the dimension of components. After the analysis of the research papers, the longer-term scope of the research was also suggested. Keywords- Hydraulic jack, Scissor lift, Design, Safety</p>

II. CONCLUSION

During the research project, we solved many problems and learned a lot. In the beginning, we have just begun to define a problem that affects society and farmers. With the drive to do something, let us overcome the growing weightlifting problem of farmers. Therefore, we have developed a project that can solve this problem with great determination. We have carried out a number of tasks, including extensive research on the current situation of farmers and the difficulties they face on the farm. Actions that affect your posture. We performed a survey amongst farmers. We concluded that your problem can be avoided. This is why we have developed hoists with worms and worm gears and trolleys for climbing stairs.

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