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Design and Fabrication of Battery Operated 2-Wheeler Forklift

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Abstract: ***In today life there is wide of forklifts variety of forklifts from the large heavy loadings trucks to the one that works among narrow aisles forklifts have becomes one of basics transportation tools we use in our lives with all the forklifts in existence we find that there are some improvement that can be to bring forklifts to the better performance.***
Segway is a self-balancing transportation device with two wheel can operate in any level pedestrian environment In general the forklift can be defined as the machine capable of lifting heavy weights that is difficult for an ordinary human being to lift. It is similar to vehicle but a addition of two forks to lift the weight makes the difference. The operator using these forks can lift any heavy weight material on a click of button without any effort.
Keywords: Forklift, Transportation, Segway, heavy weight, buttons.

I. INTRODUCTION

A forklift truck is one of the most used machines employed for several types of tasks. they range from warehouse use to large scale industry with multiple locations. they make lifting of heavy objects fast and a whole lot easier than manual lifting. there is a wide range of forklifts to select from going well with your particular requirements and necessities. rough terrain forklift trucks are used primarily in new construction work locations and areas where you may be on dirt or loose gravel. forklift trucks are either powered by propane, electricity, gasoline or diesel. electric forklift trucks rely on the batteries to operate. propane or gasoline forklifts are faster or stronger than electric forklifts, but they're more difficult in maintenance, & fuel can be costly. the electric forklift trucks are great for the warehouse use as they don't give-off noxious fumes like the gas-powered machines do. forklifts are often used in the warehouses; however, some of them are meant to be used outdoors. vast majority of rough-terrain forklift trucks operate on propane or gasoline, but some of them are powered by natural gas or diesel. rough terrain forklifts have the greatest lifting capacity of the entire forklifts & heavy duty tires, making it likely to drive on uneven surfaces outdoors forklifts have revolutionized the warehouse work.

II. LITERATURE REVIEW

By taking the reference of an actual forklift we have designed and fabricated miniature two wheel drive forklift which is cost effective. The construction of structure is made by using metal frame, lead screw, chain sprocket, C- channel, nuts, bearings etc. There are different types of forklift around us that are powered by gasoline, electricity but they are very much tough to handle and fuel that are used are very much costly. To solve these criteria, we introduced a 3-wheel forklift that run on both electric power that are used for loading and unloading using hydraulic jack by forks. These consists of forklift truck driver, straddle carrier drivers and other workers like crane operators and other company workers. The importance of the low back symptoms was much higher in the working of forklift drivers than others workers. The market survey lets the firm to understand and realize the real demand and potential for the product under consideration. First and foremost, it is necessary to establish that the proposed product will fulfill a demand in the market or not, what is supposed to do, and the service it can offer to the consumers. After we surveyed in our institute we can found that the educational engineering apparatus up to 50 Kg is not easy to move from one place to another place.

III.3D CAD MODEL

In the designing and fabrication of two-wheel fork lift drive first collect information with the help of research papers. Then the parts which will practically fabricates first make the 3D design in the AUTO-CAD software. Then with the help of actual designing calculations decides the standard parts. After this step with the help of ANSYS software analyse the forces and deformation of the fork. Then with the help of desire and safe dimensions fabricate the prototype of the project. Then testing is carried out and the result and conclusion is drawn.

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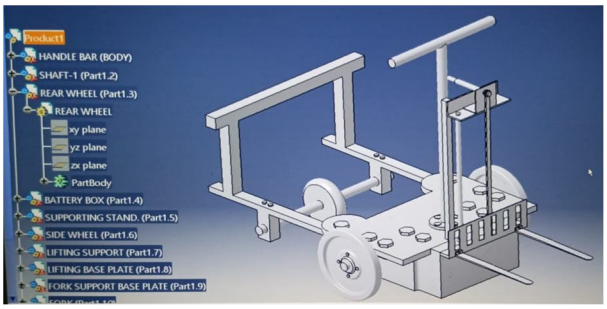


Fig. A. Isometric View

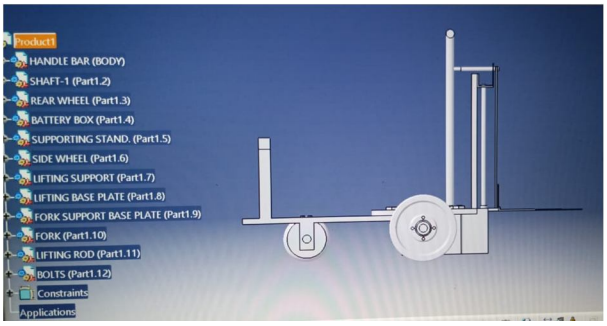


Fig. B. Side View

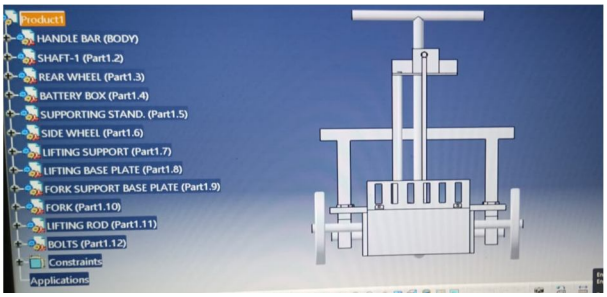


Fig. C. Front View

IV. WORKING

Forklift works on semi electric techniques where power is transfer from one form to another by using mechanical as well as electrical components. In this project we have worked on the transfer of rotational motion to linear motion by using a dc motor which is constructed by using The arrangement of motor is connected with the wheel shaft. The vehicle is run through the motor. The motor is attached with battery. The motor is also connected with the spur gear to increase the torque and the wheel is directly coupled by the torque in the form of bearing so the vehicle can run. There is a control unit which control the motor actions. The major causes of the vehicle is no pollution occur. The lead screw is assembled vertically on the guide column and the attachment of fork is done with the lead screw. With the help of motor, the rotational motion of the lead screw is transforming into linear motion. The front line of platform the forklift positioning is assembled. Its function is to transport the goods over short distance as when the requirement occurs . It must control the load and goods in the correct alignment to meet the conflicting requirements of stable running on straight track and good curving performance with low track wear. At same time, it must also provide acceptable ride levels in the vehicle to which it is fitted, under a wide range of track conditions.

The project works on action of rotational motion transfer into linear motion. For this cause here 12V, 2.5A D.C motor are used. The arrangement of motor is connected with the wheel shaft. The vehicle is run through the motor. The motor is attached with battery. The motor is also connected with the spur gear to increase the torque and the wheel is directly coupled by the torque in the form of bearing so the vehicle can run. There is a control unit which control the motor actions. The major causes of the vehicle is no pollution occur. The lead screw is assembled vertically on the guide column and the attachment of fork is done with the lead screw. With the help of motor, the rotational motion of the lead screw is transforming into linear motion.

The front line of platform the forklift positioning is assembled. The safety is main consider we taken for the design of the forklift, where the forklift is in the course of loading and the stability of moving system consist point of 3 contacts, 2 rear rotary wheel drives and in front 2 supporting wheel are placed.

V. METHODOLOGY

A forklift; is known as self-generated vehicle, and may be a battery-powered industrial machine; in which purpose is for material handling among compounds, especially the potential to raise weights to be positioned at certain height, also to lowers them as per needs. These are connected with specific attachments, the fork elevated machine is also made to perform alternative connected functions like the transfer masses from slip sheets onto pallets, also to clamp them or to invert them. The chassis was designed to sustain a static load of 80 kg. The rear wheels hold the motors and is attached to the frame or casing. The driving motors are housed below the frame.The frame incorporates hole for attaching front wheel, and; for attaching the fork lifter. D.C. motor is utilized in our project for moving fork, and carrying objects from one location to other; our project consists two motors to run the 2 wheels; whereas the lifting portion is completed by lead screw and it is connected to another motor. Battery provides power to motor. The battery is placed at the rear platform a 12-volt battery used to provide power.Two-wheeler forklift lifting capacity should be increase to 70 kilograms. While maintains performance at low lifting capacity within the same strength minimum variable geometry features and the use of high torque low voltage operating motor.

VI. OBJECTIVES

1) To design two wheeler drive for transporting good over short distance.
2) To analysis working of forklift machine for small scale industries.
3) To Implementation of automation for eliminating human error.
4) To uses electric power for operating this forklift which makes machine environment friendly and fuel efficient.
5) To reducing cost such as automation that reduces labor costs.

VII. ADVANTAGES, DISADVANTAGES AND APPLICATIONS

A. *Advantages*

1) Ease of Maintenance (Including Checking and Cleaning).
2) Easy for repairing.
3) Ease of lifting the loaded light vehicles.
4) Ease of handling.
5) Ease of replacement of any parts.
6) A clean, green, eco-friendly machine.

B. *Disadvantages*

1) Time consumption is high.
2) Initial cost is high.

C. *Applications*

1) It is also used in the small-scale industries.
2) It can be used in the industries, factories etc.
3) In factories and storage go downs, for storage and transshipment of large goods.
4) Movement of light goods weighing 50-80 Kg's, which is cumbersome by human labor.
5) A Two Wheel Drive Forklift is used for this purpose as it is fast, efficient, has lesser power consumption and requires lesser space for its movement.

VIII. RESULT

This project work has been completed in a limited time and hence we are proud to announce that "The Two-Wheel Drive Forklift" is able to fulfill the expectations. All the parts are connected in such a way that the equipment can be maintained and assembled easily. In this work we are able to achieve the target of reduction of size of a forklift and hence the new model is able to move through narrow passages and lift the load in a store house. We successfully conducted the test of load lifting and we are happy to announce that the forklift design made by us was able to lift load of 80Kg under satisfactory conditions.

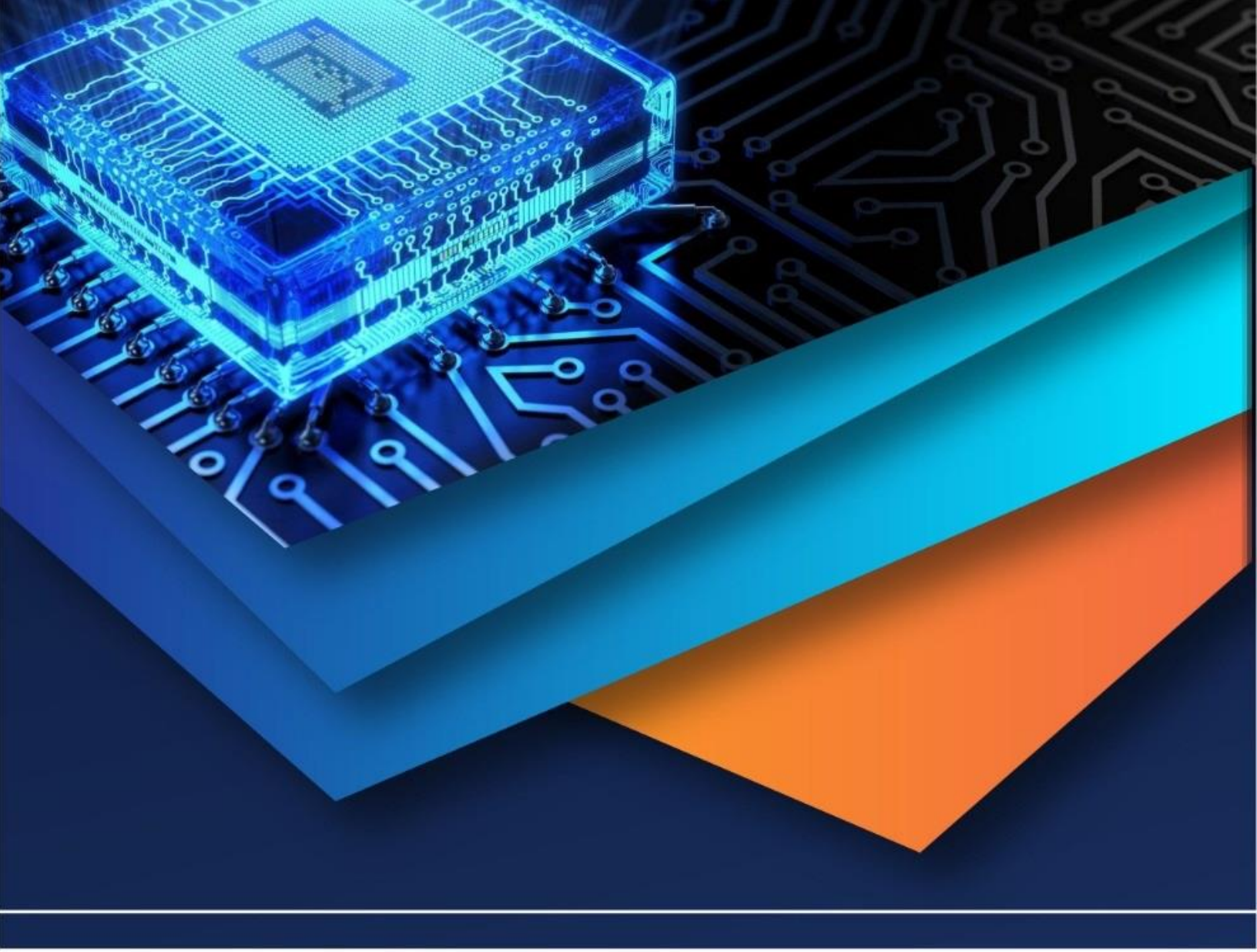
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IX. CONCLUSION

This project has provided us a plethora of opportunities and experiences, within the bounds of our limited knowledge. Not only did it enlighten us with theoretical knowledge, it also inculcated practical knowledge regarding planning, purchasing, assembling and machining in us. It is a matter of immense of happiness and pride for us in having been able to complete this project successfully in a limited span of time. We have done everything in the best possible way we could by overcoming the various constraints and by utilizing all the available amenities. The current system can be modified for lifting heavy load by using bulky lead screw and high-power motor. The size of the forklift can be further reduced for easy handling and movement the foldable designs can be provided for transporting it in light motor vehicles.

REFERENCES

[1] Seidl M, Dvoák Z (2011) In-house transport as a part of business logistics. J EngManagCompet 1(1/2):1-5.
[2] Masztelarz M (2010) Methods for accounting of ancillary activities' costs (Metodyrozliczaniakosztówdziałalnościpomocniczej) [IN] Gabrusewicz W. (ed.) Audyt w systemiekontroli; Conference Proceedings, KIBR, Poznan, Poland 29.11.2010 pp. 131–142 ISBN: 978-83-61287-45-2 http://www.pracownicy.ue.poznan.pl/ masztalerz/rozliczanie.produkcji.pomocniczej.pdf (in Polish) access: 5th November 2015
[3] Michałowska K (2013) Logistics costs in a company (Znaczenieisposobyrozliczaniakosztówlogistycznych); ZeszytyNaukoweUniwersytetuSzczecińskiego nr 765, „Finanse, RynkiFinansowe, Ubezpieczenia^ WydawnictwoNaukoweUniwersytetuSzczecińskiego. 61(2):325–334. in Polish.
[4] R S Khurmi, J.K Gupta (2005), A text book of Machine Design.
[5] S S Rattan (2009), Theory of Machines, Professor of Mechanical Engineering, National Institute of Technology, Kurukshetra.
[6] V B Bhandari (2010), Design of Machine Elements, Retired Professor and Head Department of Mechanical Engineering, Vishwakarma Institute of Technology, P
[7] J B Gupta (2011), Basic Electrical & Electronics Engineering.
[8] B L Thareja, A K Thareja Revised by S G Tarnekar (2005), Electrical Technology, Former Professor & Head, Electrical Engineering Department,
[9] Visvesvaraya National Institute of Technology, Nagpur
[10] Conte M (2010) Super capacitors technical requirements for new applications. Fuel Cells 10:806–818.



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