

Design And Fabrication of Multi-Purpose Forklift Drive

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Abstract- Aim of this project is to develop an automotive system for loading or unloading goods in workplace like workshops, industries and so on. The project having innovative idea by update forklift with putting a trolley in between the system which helps in increasing of uplifting loads which have to be taken from one place to another over short distances. In addition to this, our project has also hydraulic system which is fruitful in easily loading heavy goods.

Keywords- 1) Forklift, 2) Fork frames, 3) Hydraulic System, 4) Power Steering Mechanism, 5) Scissor Lift, 6) Safety Triangle Mechanism, 7) Counter Weight

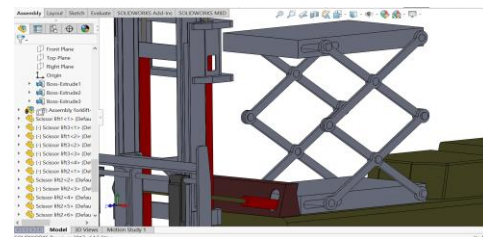
I. INTRODUCTION

In this project, we researched on forklift design that is new and unique from existing designs. The new design has two unique features: one is that the forklift has scissor lift attached to the truck body on both ends and the other one is that the hydraulic mechanism is more compact. We use CAD modeling and SOLIDWORKS modeling to create the 3D design of project. This software modeling is also fruitful in giving proper safety analysis of the project model.

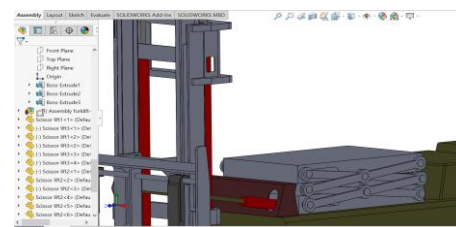
II. WORKING PRINCIPLE

- Primarily, goods are loading on front forks by remote or manual system.
- Further, it transfers to scissor trolley which is located after the fork frames.
- This happens with the help of hydraulic mechanism present for carry loads. Accordingly, after the transfer of loads to scissor lift, the front fork carried additional load to the forklift.
- The wheel shaft is connected with arrangement of a motor.
- The motor is connected to the worm gear to increase the torque and is directly coupled to the wheel by means of a bearing block which runs the vehicle.
- The additional trolley is added which is up and down movements by scissor lift.

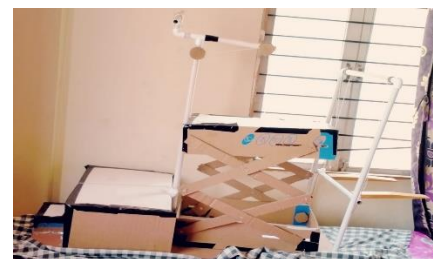
- In our design, parts have been designed and created individually.
- Among these components, some of them are put as a subassembly named Scissor Lift and some of them as another Lifting Fork subassembly. Our final forklift assembly model here composed of these two subassemblies along with the remaining parts.
- Here the views of our model prepare from CAD software with analysis and material selection.



Uplift Position



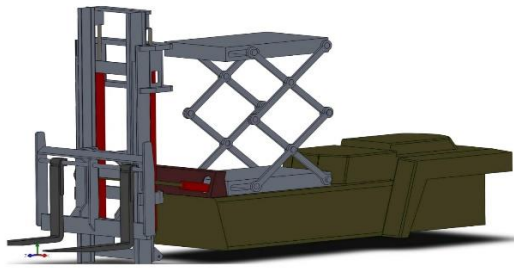
Original Position



Side View



Top View



Final Fork Lift Assembly

III. MAIN COMPONENTS OF PROJECT

Scissor Lift:

The scissor lift is the lifting system that is placed under the operator's cabin. It functions as a lifting device, changing the height of operator's cabin to provide a clearer operating view. Since forks are connected to the operator cabin, the rise of the cabin will also deliver a higher loading range.

Lifting Fork:

The lifting fork is one of the most important parts of the forklift. Its job is to grab the load from shelves and move it up and down during the loading process. It is placed in front of the whole truck and connected to the operator cabin. First, we will introduce the subassembly and its components. Then we will demonstrate how lifting fork work by demonstrating its three basic movements.

Other Components:

- Forks
- Fork Frames
- Hydraulic Cylinder
- Push Rod
- Motor
- Steering
- Wheels

IV. SCOPE AND OBJECTIVE

- Additional Loading Capacity
- Automation in Loading and Unloading
- Use of modern technology
- Maximize efficiency
- Minimize in cost by application of various methods and materials
- Increase in multi-purpose loading

V. FUTURE SCOPE

This innovated system of forklift is going to very fruitful in industries and mini goods carriage. The cost of the forklift is less compared to existing designs by applying proper material selection. In future the advancement of technology is also helps in increasing efficiency and safety control too in implement of forklift. The forklift should be more compact and simpler by improvement in present design and implementing advance equipment. In short, this design will make more helpful for small scale industries.

VI. CONCLUSION

In this type of system method of implementation of fork truck improvement of mechanism and can added the multiple function in forklift they can benefit of buyer they have achieve company distribution goal can easily.

Future Research includes research on forklift's weight change and stability during the turning and speeding up process, adjust the balance of the Forklift drive.

In this system improvements like counter weight can be added and back side of the main sitting in forklift stability can generated and efficiency can be improved.

Our invention is very useful for worksite where materials and goods have to move from one place to another place over short distances and it also serve the needs of various industries including warehouses and other large storage facilities.

VII. ACKNOWLEDGEMENT

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