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Battery Operated Forklift

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ABSTRACT

Forklift is a machine that brought revolution in a mechanical industry and all heavy engineering company uses it. Forklifts had changed the way loading and unloading of heavy weight cargo. Fork lift made it possible for a person to move thousands of kilograms of heavy load from one place to another without many efforts. To enhance the tech this prototype is constructed with remote technology, so that the person working on it can walk along with the forklift so that he can accurately place the container which, in end will increase the safety.

Keywords— Forklift, Battery operated, Remote controlled

1. INTRODUCTION

A forklift is defined as machine or a tool capable of lifting hundreds of kilograms of weight. A forklift has two forks on the front used to lift the heavy loads. The forklift driver drives the forklift forward until the fork pushes the cargo, and then lifts the cargo. The forks are made of steel and can lift up to a few tons. A forklift uses lever/pulley mechanism. A forklift may look like it is an advanced technology but no it is used from past 2000 years. The romans use forklifts to build large monuments. Medieval churches were made to with them. Also, Egyptians used it to make pyramids. This project is about constructing the forklift with slightly changes in the mechanism.

2. RELATED WORK

[1] Forklift related accident occurs in all types of industry sectors from small to large scale industry. Nearly 85 deaths per year, 35000 serious injuries annually, and non-serious accidents reach 61,800 each year. Most of accident occurs due vehicle roll over, while carrying the load on the forks while lifting; sometimes the operator lifts more weight than the capacity of the forklift. [2] To overcome this our objective is make battery operated forklift which aim environment friendly and fuel efficient with handling. As it is remote operated it will reduce number of accidents. As it remote control there is no special skill is required for the operator which makes it easy to handle rather than complicated device. This forklift will provide better visibility, accuracy and precise lifting of load and thus it will reduce the no. of accidents which will help in safe transportation of load from one place to another. [3] Forklift is an industrial truck used to lift thousands of kilograms of weight. Forklift is mostly use in warehousing and manufacturing industries. Basically, a Forklift has two Metal Forks which is also called as blades which is capable of lifting tons of weight. The forks are made of steel. Forklift is mainly gasoline or electrically operated. Electrically operated forklift is depends on batteries. Gasoline forklift are more powered than electric. But electrically operated forklift and more efficient and has less maintenance cost as compared to gasoline.

3. EXISTING SYSTEM

There are different types of forklifts. These wide varieties of trucks range from the large heavy loading trucks to the ones that could be used in small scale enterprises. These forklifts are the basic transportation needs for large scale as well as the small-scale industries. The productivity and efficiency of a workplace decides the forklift they require for their warehouse. The existing

forklift designs have its own limitations and also come with risk factors. One of the major risks involved is the safety of the deployment of the cargos and also the safety of the drivers who are operating the forklift. Although a great deal of effort has been made developing these system inventions, our study shows the lack of safety for the operations that are to be performed for the lifting and deployment of products as well as safety of lives.

4. PROPOSED SYSTEM

Forklifts were developed in the 20th century; it has since become an essential piece of equipment in the industries. Forklifts mainly use gasoline, propane or diesel. Although forklifts operated through these sources are faster and stronger, they are difficult to maintain looking at the expense of the fuels. Hence our team proposes the idea of Battery-operated forklift with is indeed an environment friendly effort and cost-effective too. As we know that the driver, who is the operator of the Forklift is the main controller who operates needs to follow all the safety precautions that are needed while using a forklift.

Driving a forklift is similar to driving a car in reverse. The operator should be able to handle the forklifts rear wheel steering meaning that the driver must steer in order to move in a straight direction to lift and deploy the products safely. To enhance the system, we have proposed a Remote-controlled technology. By introducing this remote technology, the operator can walk along the forklift for a better visibility and the cargo cartons can be placed in the exact position avoiding any mishaps. This increases the safety of the operator and also the cargo products that are to be lifted or deployed.

5. DETAILS OF THE REQUIRED COMPONENTS

The key components of a battery powered Forklift which makes it different from an engine powered Forklift is:

- Battery
- Controller and switch
- Inverter
- Motors
- Battery charger with cables

Electric forklift uses battery to store electrical energy that is ready to use. A battery pack is made up of number of cells that are grouped into modules. Once the battery has sufficient stored the vehicle is ready to use the forklift. This is a rechargeable battery which needs to be recharged again after every 80% of use of full capacity. Battery technology has improved hugely in the recent years, current forklift batteries are lithium based and these have a very low rate of discharge, this means a forklift should not loose charge if it isn't driven for a few days.

Controller is like the brain of the vehicle managing all of its parameters. The controller acts as a pipeline or a gateway motor. The controller will do other things too like it moderates the power and will also act as a converter. It will convert power from DC to AC or it might also increase or decrease the amperage etc. The controller is the brains of the system. This controller works based on the operator's commands from the switch and release the required outputs.

Inverter is a device that converts DC power to the AC power used in an electric vehicle motor. Motor is an electric motor which is the propulsion system converts the electric power into physical energy for movement. There are two motors involved one for travelling and one for the hydraulic system operation. The battery charger converts the AC power to DC power stored in a battery.

6. SYSTEM IMPLEMENTATION AND DESIGN

As the name suggest it is a battery-operated forklift works totally on battery and is remote control operated. So the idea behind this was reducing the accidents occurs in industries and making it safer to carry and transport the load from one place to another by avoiding number of accidents. So, the operator can walk by side of the forklift once reached to the location and then control it by remote and adjust the forks which are remotely controlled and lift the weight precisely as the operator has better visibility as he is in the ground.

7. FEATURES

The features of our proposed battery-operated Forklift are:

- Suitable for all the warehouses.
- Eco-Friendly
- Longer Life
- Minimum noise level
- Increase productivity
- Safety of the cargo and driver
- Operation cost is low
- Reduces damage of products
- Increases the visibility of the driver

8. CONCLUSION

In this growing technological world, we learn and understand that there is a technical solution to uplift and upgrade every problem. By proposing a remote controller for battery operated forklift, there is a varied possibility to limit the mishaps and damage of the product increasing the visibility of the driver to operate the forklift in the best way.

9. FUTURE SCOPE

From our proposed work of controlling the forklift by the remote controller, we also see that further enhancements can be introduced such as the maintaining the forklifts stability and boosting the speed process plus the accuracy of deployment and lifting of a product.

10. REFERENCES

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