

# Human Powered Forklift

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**Abstract**—Human powered forklift is a new and advance technique use in mechanical industry line. Forklift lift or handle more material and transfer one place to another place. Because of forklift it is possible that a one operator is sufficient for material handling. When technology is improved advance fork lift was developed, they operate with the help of remotes. It requires electricity as well as a cost of remote operated forklift is high so that a human powered forklift is introduced. A mixture of material handling systems is in the use, exact from that entirely physical to the ones that are semi-automatic but manually controlled. Forklifts have revolutionized warehouse work. We made it possible for one person to move 100 kg at once. Well-maintained and safely operated forklifts make lifting and transporting cargo infinitely easier.

**Index Terms**—Human, Forklift, Material, Safety, Technology

## I. INTRODUCTION

Now a days due to heavy work load environment in the mechanical industrial lines workers are been depressed for carrying a heavy load, where the workers are prone to unhealthy conditions [1]. Due to these factors some load carrying machines were developed in the recent past years. Working in the mechanical workshops or any other large fabrication unit, where load is to carry (bars, plates, machined jobs etc) from one unit of the factory to the other unit this device is useful [2]. The In-plant goods carrier system is user friendly as designed. The device finds greater use in the industrial lines for transport of the machined jobs, carrying goods internally in the fabrication plant [3]. The present in-plant goods carrier system is used for the industrial applications which can be moved from one place to other and hence the work such as carrying goods or any other is done within the time schedule and the particular cycle time for that operation is saved, the handling, fixing and the other time wasted in carrying goods can be better utilized to carry out the production [4]. The device works on the simple mechanism of the motion transmission. It consists of bevel gear mechanism where motion from wheel is transmitted to rear wheels with the help of chain and the device moves further. There is paddle attached to the front wheel axle to rotate and turn. The device can be used on any surface of ground as the wheels are made up of mild steel which is hardened to carry the entire load [5]. This machine transfer a work from one station to other hence work is done in time so that we get more production as well as accuracy. This gives better production efficiency. Due to material handling machines we reduce cycle time of particular job by reducing handling, fixing and carrying time [6].

## II. OBJECTIVES

- ❖ To make a complete mechanical device.
- ❖ To make a device which is suitable economically for small scale industries; taking into consideration the cost factor this device is suitable for small scale as well as big scale industries.
- ❖ Taking safety as prime consideration; this device is safer in all respects.
- ❖ To build a device this is helpful for carrying in-plant loads.
- ❖ To develop a device this is helpful for the industrial works etc.
- ❖ To save the cycle and other time of the job production.

## III. EXPERIMENTAL SETUP

A bicycle foot paddle, bicycle wheels, industrial wheels, pulleys, bearings, sprocket, chain, handle, paddle drum, seat, tripod steering system, rope are used in experimental setup. Human powered forklift consist of frame which is made of steel square bars which are welded together to form a structure. A fork is made in front to lift a load upto 100 kg. Tripod steering system is used to give direction for wheels. Forklift are rated for loads at a specified maximum weight and specified towards center of gravity. A important aspect of forklift operation is that most have rear wheel steering. Before starting experimental tests, the load is kept on the fork and then tests were conducted. The load is lifted by operating a foot paddle and direction is given by tripod steering system.



Fig 1 Photographic view of human powered forklift

#### IV. WORKING MECHANISM

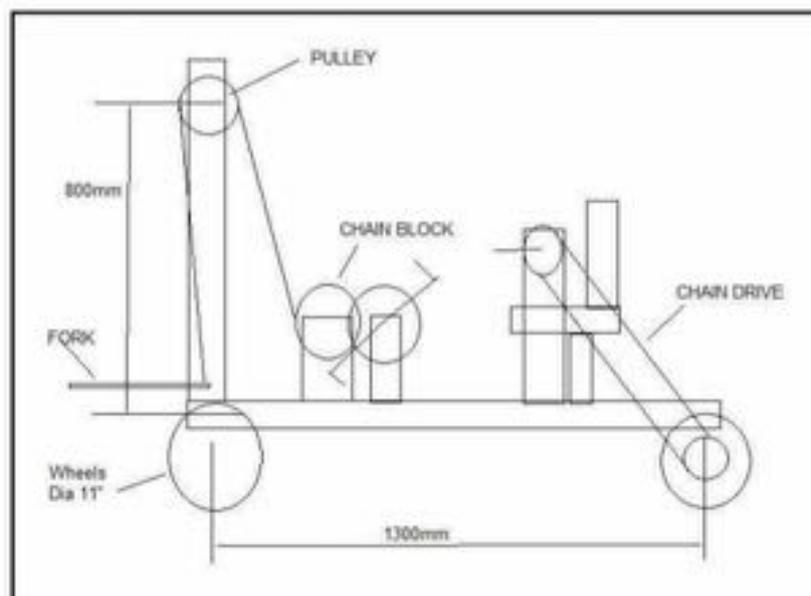


Fig 2 Schematic diagram

The mechanical fork lift machine consist of frame which is made up of steel square bars which are welded together to form a structure. Wheels are attached for easy movement of the fork lift. The machine consists of a chain & paddle mechanism which is helpful in easy movement of the machine. The handle wheel & the chain sprocket mechanism are used to give motion to the wheels & to turn the wheels. The paddle wheel and the chain sprocket mechanism are used to give motion to the lift for easy lifting of the substances or to place the substances or parts at the required place.

#### V. FUTURE SCOPE

We feel the project that we have done has a good future scope in any engineering industry. The main constraint of this device is the high initial cost but has low operating costs. The machine designed should be based on the size. Savings resulting from the use of this device will make it pay for itself with in short period of time and it can be a great companion in any engineering industry dealing with goods transport. One can properly design to take larger loads than 0.5 tonne. The device affords plenty of scope for modifications, further improvements & operational efficiency, which should make it commercially available & attractive. If taken up for commercial production and marketed properly, we are sure it will be accepted in the industry. It has

plenty of scope if the device is made larger in size so that the capacity of carrying weight and the load is maintained properly. Distance between two arms of the fork can be adjusted using normal lead screw arrangement.

## VI. CONCLUSION

We conclude that, this project will helpful for small scale industries as it is easy to operate with less cost and indirectly it will save the labor cost. Savings resulting from the use of this machine will make it pay for itself with in short period of time and it can be a great companion in any field dealing with rusted and unused metals. It is mechanical device, does not required electricity as well as any external source of battery. The development of mechanical forklift assures the ergonomically comfort to the operator or worker and to reduces time required for manual lifting and handling. This increases efficiency of productivity and it provide safety of operator while handling of the material. It lifts maximum load up to 100 kg at maximum height of 1250 mm.

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