

Design and Development of Rear Rack Mechanism

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Abstract - Mean of paper is to design and construct a rear rack machine. This machine is used to bend straight pipe into curve at right angle. This machine is easy convenient for portable work. This machine is made up of mild steel. Pneumatic rod bending machine consist of Pneumatic cylinder, Compressor, Hoses, Pulley, Cutting blades, Fixture, Electronic circuits, Switches and wiring. The rod is bent by the Pneumatic actuator piston with holding the rod in the fixture. The main work of our paper is the circular shape of the pipe is bent continuously without repositioning the rod in the machine.

Key Words: Bend straight, Continuously, Electronic circuit, Pneumatic actuator.

1.INTRODUCTION

Since long time ago the labour work has essential role in constructions including mixing coarse aggregate-sand water- cement, ramming sand, land levelling, and digging the foundation for base of structure, cutting rod in required length, rod bending and pouring the mixture of concrete in columns and beams. Now present days, because of development in technology it is required to reduce the labour work as well as time also since there are lot of available resources. now a day population increasing very rapidly, demand of the cycle is increasing, human livings and population is continuously increases. Several problems come in to the picture when we consider human work with respect to automation. By using automatic bending machine is used to reduce human effort also time should be less.

The paper is designed based on the principles of pneumatics and the system is automatic type. By using automation the productivity of the product can be increase.

1.1 LITERATURE REVIEW

- [1] Mohan Krishna S.A. on "experimental design and fabrication of a portable hydraulic pipe bending machine". in International Journal of Development Pneumatics is a branch of engineering that makes use of gas or pressurized air. Pneumatic systems used extensively in industry are commonly powered by

compressed air or compressed inert gases. A centrally located and electrically powered compressor powers cylinders, air motors, and other pneumatic devices. A pneumatic system controlled through manual or automatic solenoid valves is selected when it provides a lower cost, more flexible, or safer alternative to electric motors and actuators. Pneumatics also has applications in dentistry, construction, mining, and other areas.

- [2] Vishal Tambat, Nilkanth Rane, Omkar Savant, Pankaj Yadav on "Pneumatic Shearing and Bending Machine" in International Journal of Recent Research in Civil and Mechanical Engineering Pneumatic systems in fixed installations, such as factories, use compressed air because a sustainable supply can be made by compressing atmospheric air. The air usually has moisture removed, and a small quantity of oil is added at the compressor to prevent corrosion and lubricate mechanical components.

Factory-plumbed pneumatic-power users need not worry about poisonous leakage, as the gas is usually just air. Smaller or stand-alone systems can use other compressed gases that present an asphyxiation hazard, such as nitrogen often referred to as OFN (oxygen-free nitrogen) when supplied in cylinders.

2. Construction and Working

In this paper the rod is bend with the help of pneumatic force .The rod is feed manually with the help of man and pulley arrangement. In this paper our aim to bend 15mm diameter of bar. In this piston is moves with help of foot paddle operation by supplying pressure air into the piston and then it bend the rod. This process is very convenient and less effort.

According to the design and principle of operation:-

1. Rotary screw compressor
2. Turbo compressor

Positive displacement:-

Positive-displacement compressors work by forcing air into a chamber whose volume is decreased to compress the air. Common types of positive displacement compressors are:-

Piston-type air compressors use this principle by pumping air into an air chamber through the use of the constant motion of pistons. They use one-way valves to guide air into a cylinder chamber, where the air is compressed. Rotary screw compressors use positive-displacement compression by matching two helical screws that, when turned, guide air into a chamber, whose volume is decreased as the screws turn.

3. CONCLUSIONS

- By using pneumatic bending mechanism, the manually controlled bending is converted into semi-automatic machine by which maximum operating time will be saved.
- Output will be more.
- This modification of the bending system increases the industrial production by 30% - 40%.
- This pneumatic bending system reduces the production time.
- Scratches are avoided.
- Less human effort required.

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