

# Modified Pneumatic Carriage Bending Machine

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**Abstract** - The bending machine is one of the most important machine tool in sheet metal workshop. It is primarily designed for bending. The bend has been made with the help of punch which exerts large force on the work clamped on the die. The bending machine is designed in such a way that, it works automatically. The automation strategy, when implemented is believed to result in reduced cycle time, costs and improved product quality. Other possible advantages are repeatability, increased productivity, reduced labor and integration of business systems. Automation is achieved with the help of Electro pneumatic system. In the industry we use three methods for transmitting power from one point to another. Mechanical transmission is through shafts, gears, chains, belts, etc. Electrical transmission is through wires, transformers, etc. Fluid power is through liquids or gas in a confined space.

**Key Words:** Bending machine, Automation, Electro Pneumatic System, Mechanical and electrical Transmission.

## 1. INTRODUCTION

The bending operation of the carriage rod is done manually by a worker. Sometimes operation done by the workers cause over bending or under bending. It affects the precision and quality of the product and also alignment of the part with other part. It leads to disturb the whole production system. Continuous working on bending machine would cause fatigue to workers body. So it is necessary to implement automation for bending operation so as to overcome the losses.

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We use three method for transmitting power from one point to another as per requirement. Mechanical transmission is through shafts, gears, chains, belts, etc. Electrical transmission is through wires, transformers, etc. fluid power is through liquids or gas in the confined space.

## 2. LITERATURE REVIEW

Victor Andrade [1] In this paper author introduced the information on how specific design qualities enhances cycling with help decisions makers to develop better and more cost effective bike infrastructures. The elements of the studies is a questionnaire amongst users of the three infrastructures allowing the determination of socio-economic characteristics of the users and effects of the infrastructures in terms of the use of the bike. For better bike infrastructures proper design considerations are needed, this considerations enhances the cycling. Thus the infrastructures have to be cost effective.

Avesh Khan [2] In this paper author describes that, a bicycle trolley is a motor less wheeled frame with a hitch system for transporting cargo for bicycle. It can greatly increase a bicycle cargo capacity. The trolley may be required for a specific use, such as the transport of passengers or the movement of the particular type of cargo, or it may be needed as a general purpose goods carrier. The trolley has been in existence since a very long time and has been providing human with ease of carriage of loads rather than carrying it by themselves.

Shengzhi Chen [3] In this paper, they shown that in pneumatic system, it is not easy to determine or measure the air power flow because of the compressibility of pneumatic system. In this paper, they used air power to measure the energy consumption of flow in pneumatic cylinder actuator system. Meter-in circuit and meter-out circuit of speed control systems in this research. The model estimates the pressure change in charge and discharge side of cylinder, and also the displacement and velocity of the piston. Furthermore, energy consumption could theoretically be calculated when the change of air state is regarded as isothermal change.

Thokale Manoj [4] They have shared that the main objective of their paper is to implement the pneumatic rod ending machine in the construction sites with less cost compared to the existing bending machines, and increasing the productivity of the stirrups. In this paper is aimed to do bending operations for stirrups using pneumatic and named as pneumatic rod bending machine. Pneumatic bending machine consist of pneumatic cylinder, compressor, hoses, pulley, cutting blades, fixture, electronic circuits, switches and wiring.

### 3. CONCLUSION

The modified pneumatic bending machine has been design fabricated for bending the rods of cycle carriage easily. This machine is suitable for mass production of carriages. This machine is pneumatically operated which reduces human effort and hence less chances of fatigue to labors. This provide flexibility during operation.

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