

# Bar Bending Machine

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**Abstract:** *Mechanical Engineering without production and manufacturing is meaningless. Production and manufacturing process deals with conversion of raw materials inputs to finished products as per required dimension, specification and efficiently using recent technology. The new development and requirements inspired us to think of new improvements in manufacturing field. In our project Pipe Bending Machine various diameters of bus bar is being bend with the help of this machine and various shapes is obtained like v- shape, circular, square, channel etc. It is widely used in various industrial operation such as bending a tube to make coil or sheet metal to make certain shape such as 'V' shape. This project is automated bus bar bending machine that that controls the bus bar bending according to our required angle. In our project we use mechanical arrangement to bending machine which may obtain various dimensions of bus bar is being bend and we get various angles of bending bus bar like 30,45,60,90 angles other than convectional methodologies involves major labor work, manual handling , layout setup, high cost etc. Hence to reduce labor cost, automation is required. The major intention of this project is to automate the bus bar bending process using electromechanical system to reduce cost effective and enhancing productivity. It is used in various industrial operation and workshops such as bending a sheet metal, copper bus bar and aluminum bus bar.*

**Keywords:** Motor operated mechanically metal bar bending machine

## I. INTRODUCTION

We have made a machine which can bend a 10mm aluminium bar to a desired angle within 90 degree. With the use of 3hp motor and some complex mechanisms this machine is made. This bended metal bars have various uses in mechanical equipment as well as electrical appliances.

## II. OVERVIEW

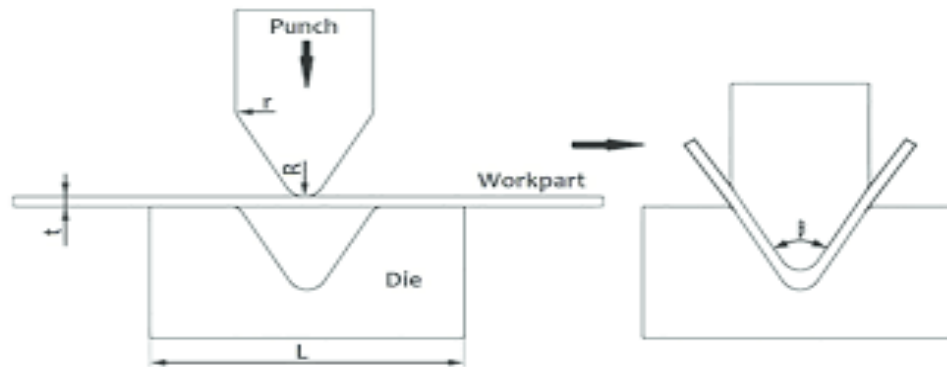
A bending is a process of bending a metal. The metal can be a sheet metal, tubes, square hollow, rod, and iron angle. This type of metal has its own thickness. In bending machine designing several considerations is taken into including type of metal, bender, power driven or manual and the size of the bending machine. Usually, the difference of these types of bending machine is only on the capacity of the bending machine that can bend a sheet metal. Today, the bending machine that available in the market is for the sheet metal and tube bending machine. Many machine makers vary their products based on the capacity of the bending machine and power driven or manual. Moreover, most of the machine uses notch bending type. This type of machine has basically 2 dies one of them is fixed and the other one is moveable. The sheet metal needs to put between the dies and then pressed around it until the desire shape is acquired

## III. LITERATURE REVIEW

- **Problem analysing and Experimental Plan:** The information gathered in literature review is processed and the salient findings and short comings are illustrated in this chapter. Considering this aspect, how the problem of the present work is formulated is explained. The literature review has enunciated the criteria of design and development of metal bending machine in the experimental work, experimentation plan is designed
- **Experimentation:** In this chapter how experimental plan is implemented and the test runs are conducted is systematically elaborated. The experimental procedures are clearly specified along with how the observations are recorded. The data of different variables of the system has been gathered during the experimentation).

#### IV. BENDING METHOD

The most common method is known as V-bending, in which the punch and die are "V" shaped. The punch pushes the sheet into the "V" shaped groove in the V-die, causing it to bend. If the punch does not force the sheet to the bottom of the die cavity, leaving space or air underneath, it is called "air bending".



#### V. BENDING COMPONENTS

Design It consists of several parts namely:-

1. FRAME- The frame provides support to the entire machine components.
2. MOTOR- It is fastened to the frame and draws power from ac source and it also consists of a bending die.
3. DIE- A bending die consists of a vice which is welded to it and which is used to hold a pipe firmly.
4. STAND- It is used to support the bars at other side.
5. VICE- It is located on the stand which provides strength to the bar.
6. GEARS- these are the power converting drives to convert rpm into power
7. SWITCH – it is used to change direction of rotation

##### 5.1 Construction

Bus bar bending machine of structure is made by metal plate .This structure in below side connect the v-die and the upper side to connect screw threaded rod to connect v-punch and structure on bolt is connected to the spur gear .This spur gear is connected to the worm gear of connect small spur gear. Worm gear box is connected with induction motor by jaw coupler .structure of threaded rod to external support for fixed because the this rod is not circulate but only move

##### 5.2 Working

Working In this model a single phase supply is provided to an induction motor after providing power supply motor will start run. We provided there switch which work on both side forward and reverse direction. If we start the switch in forward side then motor runs in clockwise direction and then shaft of motor is also rotate in clockwise direction this Shaft is connect with gearbox due to that gearbox will also run. In that gearbox worm and worm wheel gear system is provided this will be convert horizontal clockwise rotary motion into vertical anti-clockwise rotary motion on the output shaft of gearbox we provided one spur and this spur gear is connect with others spur gear which move in clockwise direction this spur gear attach with screw threaded rod and this screw threaded rod is moves downward and this rod connect with punch which provide bending force on bus bar. If we start the switch in reverse side then motor runs in anti-direction and then shaft of motor is also rotate in anti-clockwise direction this Shaft is connect with gearbox due to that gearbox will also run. In that gearbox worm and worm wheel gear system is provided this will be convert horizontal anti-clockwise rotary motion into vertical clockwise rotary motion on the output shaft of gearbox we provided one spur and this spur gear is connect with others spur gear which move in anti-clockwise direction this spur gear attach with screw threaded rod and this screw threaded rod is moves

**VI. FUTURE USES**

Future uses Future advance in this project operating by two method , first the automatic operated and this time cuts the electricity then the manually operate .Structure on big wheel gear to connect the handle and gear box stand and motor to sliding means small wheel gear and big wheel gear create a gap then easily operate

**VII. CONCLUSION**

The concepts behind the design of the whole machine system, which together as a whole function as the bending automatic machine, are to produce a product which would require minimum setup time for different shapes , hands free operation, and minimum maintenance. In the original rack and pinion concepts there is bend rod of any shapes. The components designed and selected for the automatic bending machine are sufficient for performing the motions of the machine without failure.

**REFERENCES**

- [1]. R. Agrawal and R. Srikant. Fast algorithms for mining association rules in large databases. Proc 20th Int'l Conf. Very Large Data Bases (VLDB), 322(10):487– 499, 1994.
- [2]. R. Agrawal and R. Srikant. Privacy-preserving data mining. Proc. ACM SIGMOD Conf., 322(10):439–450, 2000.
- [3]. P. Rogaway D. Beaver, S. Micali. The round complexity of secure protocols. Proc. 22nd Ann. ACM Symp. Theory of Computing STOC), 322(10):503–513, 1990.