

Fabrication of TMT Bar Bending Machine

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Abstract— Presently, stirrups are made manually, which suffers from many drawbacks like lack of accuracy, low productivity and resulting into severe fatigue in the operator. Bar-bending machine is a semi-automatic type of machine which utilizes less man-power. This reduction in manual work results increased output. The Principle advantages are less time consuming, production of identical stirrups, higher production rate than old traditional method. Our goal is to develop & design a machine to achieve high production rate with less man power & of desired accuracy. The bending machine is one among the foremost important machine An abstract should be 300-500 words in sheet work shop. It's primarily designed for bending. Manual bending machine takes extra time and also take more efforts to bend the work piece. Hence, it takes longer time for production. There's lack of reproducibility, repeatability, and effectiveness. It also fails to satisfy customer satisfaction. So, our aim is that the bending machine is meant in such how that, it works automatically. The automation strategy, when implemented give rise to reduced cycle time, costs and improved product quality. Further probable benefits are increased output, ease of operation and incorporation of business systems. This bar bending machine replacement for manual machine and it's a semi-automatic one by using electrical motor, gear box etc., it simplify the manual work and economic wise by reducing the labor.

Indexed Terms— Bending Machine, Production, Low cost, Automation.

I. INTRODUCTION

Due to increasing globalization, it is very much essential for the manufacturer to produce a goods having highest reliability. Metal Bending is generally

used in fabrication as an alternative method for casting or forging operations. Since it is related to human being hence it is necessary to design the joint with prior attention to safely of its user. Generally Bending is a process that produces U-shape, V-shape, or channel shapes in ductile materials, most commonly in sheet metal as per requirement on different types of bending machines. As we have studied bending is also called as flexure which characterizes the behavior of structural element when subjected to external load applied perpendicularly to a longitudinal axis of the element. In traditional method bending of straight reinforcement bar is done with hand operated mechanism. Whole accuracy of bend is depended on Skill & experience of worker. So our project is to design and develop Bar Bending Machine. Which is used to bend bar of any free size with higher speed and desired accuracy. there are machine works on pneumatic and hydraulic are also used for making stirrups but that machine has major disadvantage of requirement of large space for storage tank and compressor which makes machine heavy and immobile. A beam is an element whose length thickness and width is smaller than the length. A shell is a geometric structure in which width and length are of same magnitude and the thickness of this geometric structures smaller. There are different machines available in market for bending of TMT bar. The process can be performed using many materials such as carbon and alloy steels, aluminum alloys and titanium alloys. Rolling machines with both three rollers are used to produce of cylinders with various curvatures. The rolling process is generally performed by a three roll bending machine often called as pyramid type, because of these types of arrangement of the three rollers. The process mainly consist 3 steps: Positioning of the TMT bar, Rotate the shaft with the help of gears which is getting power from battery, repetitively performing this operation we get the bar

bend as per required shape. Due to increasing globalization, it is very much essential for the manufacturer to produce a goods having highest reliability.

II. LITERATURE REVIEW

The paper deals with manufacturing of TMT Bar which use power operated TMT Bar bending machine and manually operated TMT Bar bending machine. It also includes limitations of manually operated TMT Bar bending machine. From the results of the paper the productivity of power operated bending machine is higher. P. S. Thakare . Author told in recent year's TMT Bar bending machine is used in both industry and domestic purpose for bending the TMT Bar under the required angles and dimensions. Sometimes Heat treatment is used for TMT Bar bending but the heat treatment technique is not safe and have problems are produced in the TMT Bar , such as wrinkling, curve forming, reduced thickness, whole forming, reduced strength, easy breakable. In the hydraulic TMT Bar bending machine having an good advantage compared to heat treatment methods. V. Senthil Raja . In this paper, a bicycle integrated TMT Bar bending mechanism has been designed and developed. The applications of bent TMT Bars are in frames, barricades, handle of bicycle. Most of industries uses bent TMT Bars as air conditioning, boiler, power generation, ship building, furniture, railroad, automotive, off-road and farm equipment, aircraft etc. Due to adequate human power in countries like India, the human powered machine will result in improvement of the economy and employment of nation. In Asian countries people are facing electricity cut-off during most of the days so such system plays an important role in rural areas. H. A. Hussain . Hydraulic equipment has wide use in various automobile fields. These hydraulic instruments are used for lowering and raising chair in Barber shops and in dental clinics. Hydraulic bending machine is the suitable equipment to bend TMT Bars, rods and bars. The TMT Bar or rod to be bending is kept between the rollers. With use of hydraulic jack we implement force on the TMT Bar and bend it to the required angle depending on the dies used. Hydraulic bending machine is less expensive, flexible and portable compared to those which are discussed earlier. Hence it is better to replace current standard machines by

hydraulic TMT Bar bending machine. Mohan Krishna S. A. [4]. The aim of this paper is to develop a TMT Bar bending machine which is useful to bend a TMT Bar in workshop. This project is to design and construct a portable TMT Bar bending machine. This machine is used to bend steel TMT Bars into curve and the other curvature shapes. The size of machine is very convenient for portable work. It is fully made by steel. Moreover it is easy to be carry and use at any time and any place. It decreases human effort and requires low skill labors for operating the machine. In this paper they designed manually operated TMT Bar bending machine with use of gears, motors, pulley, and frame. This bending machine is both manually and power operated. Prashant P. Khandare [5]. Metal forming is a process in which the desired shape and size are obtained through plastic deformation of a material without any loss of material. Bending is a metal forming process in which straight length is transformed into a curved length. Roller forming process is a continuous bending operation in which a long strip of metal is passed through typical roller adjustments, until the desired curvature shape is obtained. The bending changes according to material and according to the loading condition and thickness of sheet. Mahesh Gadekar [6]

III. WORKING PRINCIPLE AND ITS IMPLEMENTATION

This machine effectively increases the production capacity of your steel yard, minimizing the use of manual labor. TMT bending machine, also known as, Bar Bending Machine are boisterously designed for life long operation making them uncomplicated to use and extremely user friendly. Our TMT bar Bending Machines are sternly designed to reduce the role of manpower as well as maintain low cost of production for our clients. Bar benders are manufactured in large batches, under tight quality controlled environment and are thoroughly tested before shipping them across the globe.

Set on a wide body with a heavy duty gearbox, Bar Bending Machines boast of a rigid design which helps maintain the performance of the machine year after year. Oil bathed gearboxes with hardened forged alloy gears provide maximum strength and innovative

features such as push button bending give operator comfort.

The automatic angle selection permits precise bend at a preset angle making it one step bending process for various forms of bends and stirrups. Bar Bending Machine is easy to use, the machine can be operated by a layman with minimal experience. TMT Bar Bending machine is highly appreciated by our clients for its high strength, outstanding performance and for being cost effective. Our Research and Development department is highly modified with the employment of the latest technology. Therefore, we incline to make changes in the machine to prepare it for easier usage keeping cost under the bindings.

Available in different models, for rebars with maximum diameter up to 28mm (Single phase/ 3 phase), 36mm, 42mm, 52mm and 55mm and can be customized as per to our customer's requirement.

IV. RESULT

The main advantage of graduation project is improving graduates students skills includes: technical skills, teamwork. As for experimental results of Fabrication of TMT Bar Bending Machine

Bending stage: for this stage of machine, it can bend a bar within few second

The machine can bend bars regardless to their lengths where the machine programing method built to deal with long bars even their length greater than feeding system.

Project idea was popular in local market where the machine increased production rate of rectangular stirrups accurate in addition to improving safety level and easy to use.

V. CONCLUSION

Bar bending machine to produce stirrup of desired accuracy the main advantage of machine over the previously used manual process is that it is man power independent and secondly the accuracy of the output job.

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