Review on Pipe bending machine

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ABSTRACT

This paper includes the manufacturing of pipe bending machine by considering various aspects. There are various applications of pipe bending in industry like for petrochemical and offshore equipment, for fitness equipment, for HVAC & refrigeration pipes, Agricultural & transportation purpose, in high pressure boiler. These applications require bent pipes of various angles. Hence this machine helps customer for achieving required accuracy in pipe bending operation.

KEY WORD:- *Bending machine, electrically powered 3 PH induction motor, Angle of bend, Design.*

1. INTRODUCTION

As it is clear fact that the human power or force is not able to do bending operation for pipes hence we need machines to do the same. Main important components are reduction gearbox, fixture, 3 PH Induction Motor and PLC (Programmable logic controller). The machine works with the contribute of 3 PH Induction Motor which provides required bending force. The reduction gearbox is used for reduction of motor speed up to required operational speed. Fixture provides main role in bending as it provides proper path for bending. PLC and limit switches ensure the perfect bending angle. This machine is able to bend the pipes at various angles.

2. WORKING

Pipe bending as a process starts with clamping of pipe into a pipe bender and clamping it into place between two dies, one is the pressure and force punch and other is the fix die. Its rotated about centre of axis clamping punch is approved pressure and force also and the bending die.

The process of pipe bending involves using mechanical pressure and force as well as push clamp material pipe, force and pressure acting on the punch to conform to the shape of the pipe. Bending and forming pipe and other section require special tooling to avoid bucking and folding. The oldest method of bending a tube or pipe is to clamping the inside with tight particles, commonly usefully these suitable fixtures for bend the part. This technique prevent the tube or pipe from coagulate. After the tube or pipe has been bend..

3. LITERATURE REVIEW

3.1 Papers from Journal:-

[1] Akbar H KhanEt.al

This paper gives information about newly designed and developed manual pipe bending machine. It states that the machine can bend pipes of various thicknesses. These bent pipes have large applications in industries. It summarises the information about construction of pipe bending machine. The machine is able to bend pipes into distinct angles also in curve shape. The machine size is so convenient that it can be easily transported according to need. The material used for machine is steel. It doesn't require highly skilled operator. This machine works with the help of gear, die and frame.

[2] Prashant P.KhandareEt.al

The purpose of this paper is to construct pipe bending machine which can easily do pipe bending operation in industry as well as at workshops. The main objectives of this machine are it should be affordable even for small scale industry, that is the investing cost should be as low as possible. The mechanism used for the machine is kept simple instead of complicated one. Pipes with 4 to 5mm thickness can be bent easily with the help of this machine. The bent pipes can be used in industries as well as in small workshops. The machine reduces the human efforts.

[3]Łukasz WargułaEt.al

This paper examines the dynamic characteristics of a 3 PH induction motor. The results we get from examination will further used for examine the capability stepper motor as actuator. It describes various characteristics of stepper motor. It includes the construction and working of motor. It also includes various applications of motor and possible usage of motor in different regions.

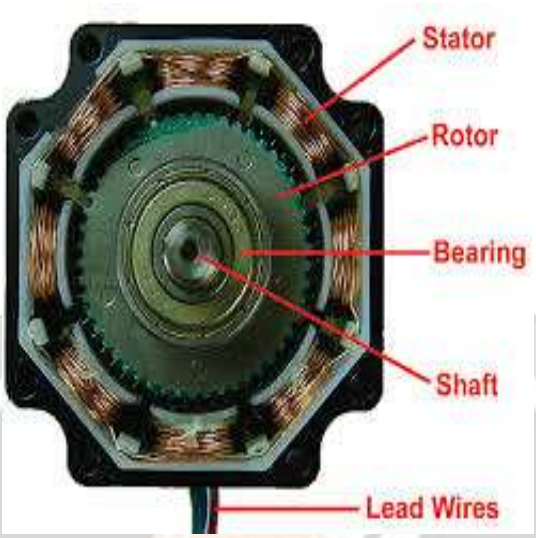
4. Design

4.1 Fixture

Bending is a commonly forging operation. Simplicity process is the bending a piece of metal, is to support it on the punch and to support its free end with automatically. If bending sample is thins out then the bending job causing weakness

4.2 PH Induction motor

DC electric motor that divides a full rotation into a number of equal steps. The motor's position can then be commanded to move and hold at one of these steps without any position sensor for feedback (an open-loop controller), as long as the motor is carefully sized to the application in respect to torque and speed.



4.3 Reduction Gearbox:-

A reduction drive is a mechanical device to shift rotational speed. A planetary reduction drive is a small scale version using bearings in an epicycle arrangement instead of toothed gears. Reduction drives are used in engines of all kinds to increase the amount of torque per revolution of a shaft: the gearbox of any car is a ubiquitous example of a reduction drive. Common household uses are washing machines, food blenders and window-winders.

5. Conclusion

I. After checking design from pressure or force point of view, designer choose the modify the design or pressure or force to change of material
II. It design is safe from pressure or force acting on punch point of view it will not fail any condition.
III. The Vibration of pipe or tube is one of the main drawbacks of failure which can be preventing under clamping of pipe or tube.
IV. If pressure or force will be fail in service, then the cost of each failure significant as it can the production. Hence total cost incurred in operation of pressure or force must be optimised.

6. Acknowledgement

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7. References

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[3]"Final working of rolling pipe bending machine", IJRMET volume 5, issue 1, ISSN : 2249-5762, April 2015