

Comparative Study of Prototype Model for Pipe Cutting Rotating Machine

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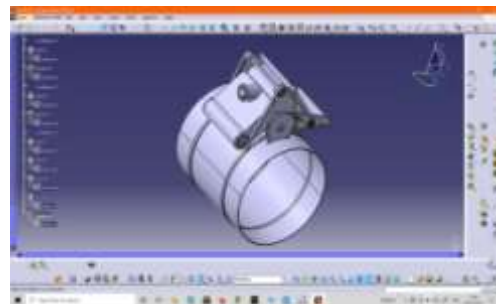
ABSTRACT - The Automation of processes plays a crucial role in improving the overall productivity of Industry. It is the electrically semi-automated, mechanically designed model of semi-automatic pipe cutting rotating machine. The main aim is to improve the overall productivity by decreasing the manpower cost, utility cost and improving quality and quantity of production. Quality of production is improved by processing the manual cutting operation by semi automated rotating cutting machine. Ensuring all the condition that the repeatability of the process with accuracy and precision. This ensures maximum elimination of human error. It also focuses on optimum use of power provided for cutting operation.

Key words – Chain mechanisms, Motor, Cutting blade, Large Diameter pipe, etc...

I. INTRODUCTION

The motto of “pipe cutting rotating machine” to slit the pipe with the help of cutting tool connected with motor which is used with the help of electrically for the desired length and also cut the pipe in less time with least wastage generated around the pipe to make it cost-effective. Designed and fabrication is used for cutting any pattern of an object like circular. This project works under the applications of mechanical and electrical based systems. According to the type of material to be cut, the cutting tool can be changed. This Machine can be widely available in almost all type of industries in which the pipe cutting process is a main operation. Normally the cutting Machine is manually hand operated one for medium and

small-scale industries. In our project large size pipe cutting can be done. The design of rotating pipe cutting machine is done by using CATIA V5 software as well as fusion 360.



II. PROBLEM IDENTIFICATION

- 1] In today's economy, the key to survival is productivity as well as quality. This means improving efficiency, minimum downtime and reducing labour cost. Rotary cutoff machine have developed into an effective method of achieving. This is to cut tube and pipe regarding of lot of sizes.
- 2] Basically, the rotary cutoff machine operates like a motor version with the help of blade or any cutting tool, or plumbers cutting tools.
- 3] In this project we are dealing with the contraction of cost efficient model and safe model for worker who is going to perform operation on the model.
- 4] As we have already seen in many already available model that it consumes high electricity and needs high maintenance cost due to many

failures and breakage in blade working on high speed due to which production cost gets high.

5] In our prototype model we will focus on increasing productivity efficiency of blade and cost of construction should be in less than the other model available in industries with high efficiency and workability.

III. LITERATURE REVIEW

Menghani et. al. [1] has developed automatic pipe cutting machine to cut the bar. Due to its compatibility, reliability it is able to cut bars of different materials. It provides an alternative to the existing automatic PVC pipe cutting machine, in terms of automating the pipe entry into the cutting apparatus, eliminates power fluctuation and lesser initial investment.

Bipinchandra et. al. [2] has designed and fabricated Automatic-Pneumatic Pipe Cutting Machine. Pneumatic mechanism is used in machine which reduce the manpower, maintain the accuracy in pipe cutting process, fulfill need of mass production in shortest possible time.

M.Nalbant et al. [3] implemented the Taguchi method to find out optimum cutting parameters for surface roughness in turning. ANOVA method was employed to study the performance characteristics in turning of AISI 1030 steel bar using TiN-coated tools.

M. Antony Xavier et al. [4] carried out an experimental investigation to determine the influence of different cutting fluids on tool wear and surface roughness in turning of AISI 304 with carbide cutting insert.

P.Balashanmugam and G.Balasubramanian [5] proposed a technique in which growth of the cutter is carried out in the upward and downward direction using pneumatic double acting piston and cylinder unit arrangement, along with the foot operated direction control valve(DCV).

Ilhan Asilturk et al. [6] focuses on optimization of turning parameters based on Taguchi method to minimize surface roughness (Ra&Rz). Experimental have been carried out using L9 orthogonal array in CNC turning. Dry turning tests were carried out on hardened AISI 4140 with coated carbide tools. It has been observed that feed rate has the most significant effect on the surface roughness

M.Z.A. Yazid et al.[7] observed surface integrity when finish turning Inconel 718, a highly corrosive resistant, nickel-based super alloy, under three cutting conditions (DRY, MQL 50 mL/h and MQL 100 mL/h). The microstructure analysis using SEM on the machined surface suggests that severe

deformation took place, leading to microstructure alteration at subsurface level measuring from a few to several micron in thickness.

Shital k.Sharma have provided an alternative to the existing automatic pvc pipe cutting machine. this method eliminate power fluctuations & lesser initial investment.

US 2300457 A by **MARIOTT** - This invention relates to stock bar feemechanism for automatic machine tools or automatic screw machines, which mechanism embodies a plunger movable in a tube or cylinder to which a motive fluid, as air, is supplied.

IV. OBJECTIVE

The objective is to improve productivity by decreasing the manpower cost, utility cost and improving quality and quantity of production.

V. METHODOLOGY

Our machine helps to cut large diameter pipe with the help of cutting tool connected with motor and motor is connected with gear which will rotates on chain. The instrument consists of different components for performing the operations which are as follows.

- 1.Electric motor
- 2.Chain
- 3.Gear
- 4.Bolt and Nuts
- 5.Bearings
- 6.Cutting tool (Blades)
- 7.Water injector
- 8.Electric wires

VI. FUTURE SCOPE

This machine also can be used in cutting metal hollow pipes, concrete pipes or PVC pipes.

- 1.In this we are using less weighted machine so that it can't damage any pipe and easy to carry.
- 2.It operates on less electricity so it is very electrically efficient.

VII. CONCLUSION

Pipe cutting rotating machine is a mechanized industrial process that cuts desire pipe or tube to get accurate dimension. Typical profiles can be cut easily in less time with higher accuracy with higher safety.

VIII. ACKNOWLEDGEMENT

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