



Automated Hacksaw Pipe Cutting Machine

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Abstract:

This project is on the design and construction of an motor operated hacksaw machine for cutting of metal to different size and length with the help of hacksaw. The objective of this project is to save man power and time in cutting metals in order to achieve high productivity. It is a cutting machine with teeth on its blade used specially for cutting metals. The power to the hacksaw is provided by the motor. The motor drives the which in turn is connected to the connecting rod. Finally connecting rod is connected to the vertical arm connected to the horizontal arm. Rotary motion of the shaft is converted into reciprocating motion of the hacksaw with the help of crank and connecting rod Work piece of desired length can be cut by feeding it to hacksaw by holding it into bench vise.

Keywords— HackSaw; Manufacturing Industries; Mass Production; Cutting Rate; Fatigue Loading; Fabrication.

I. INTRODUCTION

In the process of production of any components from PVC pipe, the preliminary process is that of cutting-off of bar stock to length according to the finished size requirements of work piece. This process is normally done by a power hacksaw machine.

In present condition many electrically operated power hacksaw machines of different companies with different specifications are available for the use in shop floor. These machines are so precise that they can cut metal bars with minimum time made up of different materials but they have one and major disadvantage that those are able to cut single piece of bar at a time. For industries to achieve the mass production, it is necessary to cut metal bars with high rate. So it is impossible to depend upon conventional single frame power hacksaw machines and need the improvement in technology and design of such machines. With the help of this multi-way power hacksaw machine the four metal bars can be cut simultaneously to get high speed cutting rate and to achieve mass production for maximum profit in related companies. As this machine overcomes all the limitations and drawbacks of conventional hacksaw machines, it is also helpful for small scale industries due to its simple working and operating conditions along with its compatibility, efficiency and affordable price.

II. PROBLEM DEFINITION

To cut different metal bar pieces with high rate and accuracy to minimize an idle time.

LIST OF COMPONENTS

II. Following are the important parts of hacksaw machines

Sr. No	Component Name	Qty
1	Motor 30 rpm	2
2	Wiper motor 30 rpm 12 volt	1
3	SMPS 12 volt	01
4	Base structure	01
5	Bearing	10
6	Roller	02
7	Arduino	01
8	Cutting wheel	03
9	Wiring & switches	

III. MATERIAL SELECTION

The proper selection of material for the different part of a machine is the main objective. For a design engineer it is must that he be familiar with the effect, which the manufacturing process and heat treatment have on the properties of materials. The Choice of material for engineering purposes depends upon the following factors:

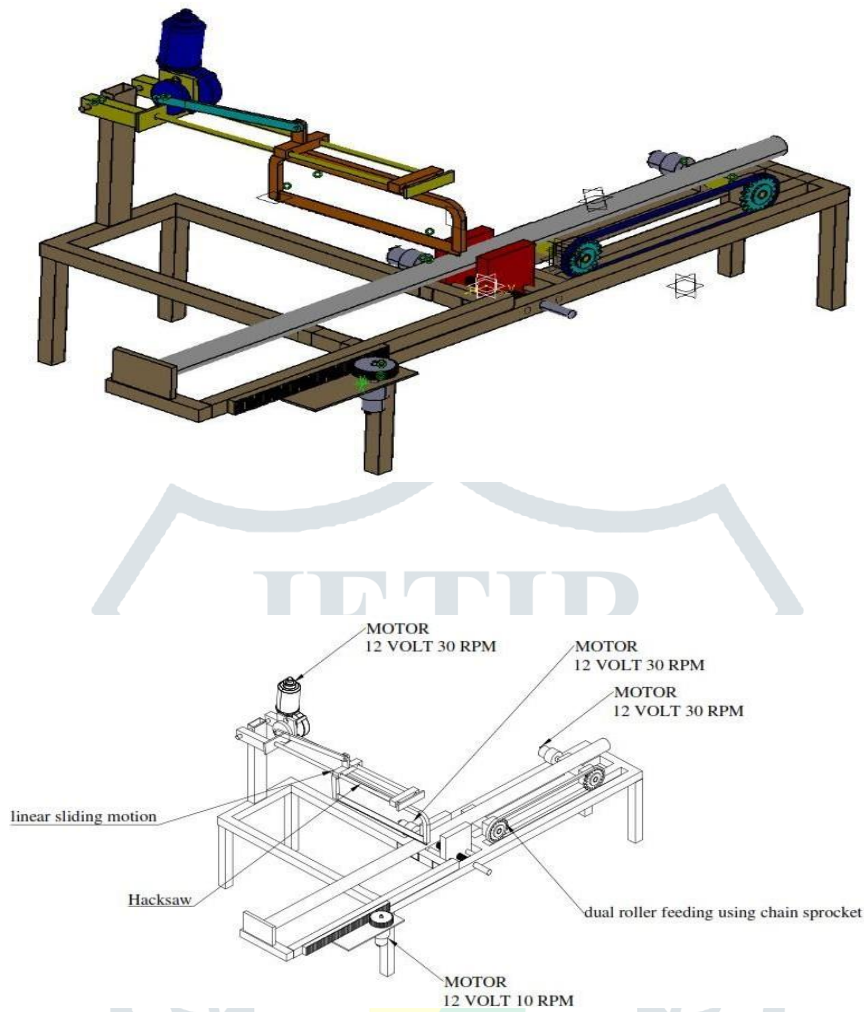
1. Availability of the materials.
2. Suitability of materials for the working condition in service.
3. The cost of materials.
4. Physical and chemical properties of material.
5. Mechanical properties of material.

The mechanical properties of the metals are those, which are associated with the ability of the material to resist mechanical forces and load. We shall now discuss these properties as follows:

- | | |
|----------------|-----------------|
| A. Strength | B. Elasticity |
| C. Stress | D. Plasticity |
| E. Stress | F. Ductility |
| G. Brittleness | H. Malleability |
| I. Toughness | J. Resilience |

When a part is subjected to a constant stress at high temperature for long period of time, it will undergo a slow and permanent deformation called creep. This property is considered in designing internal combustion engines, boilers and turbines.

IV. SYSTEM DESIGN



V. CONCLUSION

The purpose of the project is to fabricate a machine to carry out the operation like cutting various types of materials. Which should be helpful for the workers have small scale industry by the observation of the results and discussion. We met the worker who is working with hand operated hacksaw and other working on cutter machine and take details from them. The variation between manual method and cutting method are described below: The labors required for the cutting method is less than manual method. Further, the cutting method is suitable for the small scale firms as it is economically feasible. The time duration required for the cutting method is less than the manual method. The cost required for the cutting the types of material is also less. The motorized hacksaw machine to develop is just concept. The machine operated by single labor. This machine is helpful for the both the small as well as large scale industry.

VI. REFERENCES

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