



International Journal of Intellectual Advancements and Research in Engineering Computations

Multiple hacksaw cutting machine with adjustable frames

Rohan¹, Sangamesh B Herakal²

Asst. Professor, Holy Mary Institute of Technology and Science, Telangana, India

ABSTRACT

This paper presents the concept of Multi Hacksaw cutting Machine mainly carried out for production based industries. Industries are basically meant for Production of useful goods and services at low production cost, machinery cost and low inventory cost. Today in this world every task have been made quicker and fast due to technology advancement but this advancement also demands huge investments and expenditure, every industry desires to make high productivity rate maintaining the quality and standard of the product at low average cost. We have developed a conceptual model of a machine which would be capable of performing multi cutting operation simultaneously, and it should be economically efficient. The model facilitate us to get the operation performed at different working centre simultaneously as it is getting drive from single power source. Objective of this model are conservation of electricity (power supply), reduction in cost associated with power usage, increase in productivity, reduced floor space.

INTRODUCTION

Industries are basically meant for Production of useful goods and services at low production cost, machinery cost and low inventory cost. Today in this world every task have been made quicker and fast due to technology advancement but this advancement also demands huge investments and expenditure, every industry desires to make high productivity rate maintaining the quality and standard of the product at low average cost

In an industry a considerable portion of investment is being made for machinery installation. So in this project we have a proposed a machine which can perform operations like cutting a flat plate, rod into many pieces simultaneously which implies that industrialist or at workshop have not to spend more time for machining (cutting) of 'n' number of pieces.

Economics of manufacturing: According to some economists, manufacturing is a wealth-producing sector of an economy, whereas a service sector tends to be wealth-consuming. Emerging technologies have provided some new growth in advanced manufacturing employment opportunities

in the Manufacturing Belt in the United States. Manufacturing provides important material support for national infrastructure and for national defense

OBJECTIVES

1. To operate cutting operations of required cutting length.
2. To be compact to set in a workshop in less space.
3. To minimize the manpower.
4. To minimize the time.
5. To manufacture low cost machine for cutting operation

LITERATURE REVIEW

Prof. Nitinchandra R. Patel, et.al in his research paper "Material selection and testing of hacksaw blade based on mechanical properties" stated that the appropriate saw blade must be selected for better operation and fine cutting by selecting number of teeth per inch. There are four types of blades based on material namely High Carbon steel, Alloy Steel, Bi-metallic strip and

Author for correspondence:

Asst. Professor, Holy Mary Institute of Technology and Science, Telangana, India

Email: rohanishwar27@gmail.com

High speed steel blades. Out of these four the best suitable for cutting hard materials like Mild steel bar and Aluminium is Bi-metallic blade on the basis of Properties of materials, Wear resistance and Cutting performance.

D.V.Sabarinanda, et.al (April 2014) in their paper “Design and Fabrication of Automated Hacksaw Machine” gives an idea about the various components required for fabrication of the proposed model. These components will help to get smooth working condition and future automation of different mechanical actions as well as linkages.

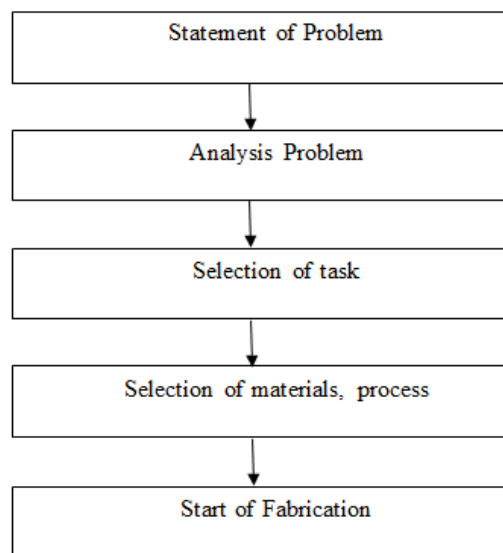
Heinrich Arnold November 2001: Rather long re-investment cycles of about 15 years have created the notion that innovation in the machine tool industry happens incrementally. But looking at its recent history, the integration of digital controls technology and computers into machine tools have hit the industry in three waves of technology shocks. Most companies underestimated the impact of this new technology. This article gives an overview of the history of the machine tool industry since numerical controls were invented and introduced and analyzes the disruptive character of this new technology on the market. About 100 interviews were conducted with decision-makers and industry experts who witnessed the development of the industry over the last forty years. The study establishes a connection between radical

technological change, industry structure, and competitive environment. It reveals a number of important occurrences and interrelations that have so far gone unnoticed.

Dr. Toshimichi Moriwaki (2006): Recent trends in the machine tool technologies are surveyed from the view points of high speed and high performance machine tools, combined multifunctional machine tools, ultra precision machine tools and advanced and intelligent control technologies.

Frankfurt-am Main, 10 January 2011. : The crisis is over, but selling machinery remains a tough business. Machine tools nowadays have to be veritable “jack of all trades”, able to handle all kinds of materials, to manage without any process materials as far as possible, and be capable of adapting to new job profiles with maximized flexibility. Two highly respected experts on machining and forming from Dortmund and Chemnitz report on what’s in store for machine tool manufacturers and users. Multi-purpose machines are the declarations of independence. The trend towards the kind of multipurpose Machining centers that are able to cost efficiently handle a broad portfolio of products with small batch Sizes accelerated significantly during the crisis. “With a multi-purpose machine, you’re less dependent on particular products and sectors”.

METHODOLOGY



STATEMENT OF PROBLEM

To design and development of multi-purpose machine is needed to minimize the man power, time and as well as less maintenance. To perform some basic mechanical operations such as, hacksaws cutting of a flat plate, rod etc into many pieces is time consuming. To avoid this an attempt to fabricate the multi hacksaw cutting machine can be done.

Analysis of problem

In an workshop for the workers it had been found that to operate the above mentioned operation needs to move from one workstation to another workstation to perform the operation which is a time consuming.

Selection of task

Due to the problem occurring in the workshop for cutting the materials into many pieces, we have thought of fabricating a machine which can cut the rods, flat plates etc into desired number of pieces with required length.

Features

- It can perform cutting operation for cutting the flat plates, rods etc.

- It contains three hacksaw frame connected to the motor, all hacksaw operates at same time and same speed,
- It is a very potable machine and you can choose to do operations of different cutting measurement according to your choice.
- It is lightweight, energy efficient and also cost efficient.

Selection of materials and process

For the fabrication of the machine we have chosen 1 inch mild steel square rod of 2mm thickness. Arc welding process for joining the rods in making the setup.

Start of the fabrication

This is the final step where the fabrication process starts of the proposed model after selecting the task and deciding the material to be used.

Fabrication of the proposed model

Fabrication has been done with the material 2mm square rods

Fabrication of chassis

Chassis is the most important base for the any type of vehicle, the chassis is made with the 2MM square rods material of total weight of 12 kgs.



Fig. 4.1 Base Frame

Mountings for the Hacksaw frames

This section is fabricated to hold the hacksaw frame



Fig. 4.2 Mounting for hacksaw frames

Mounting for pulley

This section is fabricated to mount the drilling machine



Fig.4.3 Mounting for pulley

Mounting for motor

This section is mounted to hold the hacksaw blade



Fig.4.4 Mounting for motor

Complete proposed model



Fig. 4.5 Proposed model after fabrication

CONCLUSIONS

With the proposed model it has been concluded that the multiple hacksaw cutting machine is able to cut the metal rods of different

sizes at a time in three slots. With the help of the adjustment channel. It has made the provision to add multiple channels in order to improve the productive rate.

REFERENCES

- [1]. Heinrich Arnold "The recent history of the machine tool industry and the effects of technological change" University of Munich, Institute for Innovation Research and Technology Management, 2001.
- [2]. Dr. Toshimichi Moriwaki "Trends in Recent Machine Tool Technologies" Professor Department of Mechanical Engineering Kobe University, NTN Technical Review No.74, 2006.
- [3]. T.Moriwaki "Multi-functional machine tool" ,Department of Industrial and Systems Engineering, Setsunan University, Neyagawa, Japan CIRP Annals -Manufacturing Technology DOI:10.1016/j.cirp.2008.09.004.
- [4]. Frankfurt am Main "Multi-purpose machines ensure enhanced", 1, 11.
- [5]. "Selecting and Planning the Process of Manufacture: Dr. Pulak M. Pandey. <http://paniit.iitd.ac.in/~pmpandey>
- [6]. Prof. Nitinchandra R. Patel, Mohammad A. Vasanwala, Balkrushna B. Jani, Ravi Thakkar, Miteshkumar D. Rathwa, "Material selection and testing of hacksaw blade based on mechanical properties", International Journal of Innovative Research in Science, Engineering and Technology, ISSN: 2319-8753, 2(6), 2013.
- [7]. D.V.Sabarinanda, V.Siddhartha, B. Sushil Krishnana, T.Mohanraj, "Design and Fabrication of Automated Hacksaw Machine", International Journal of Innovative Research in Science, Engineering and Technology, ISSN (Online): 3, 2014, 2319-8753.
- [8]. www.youtube.com