

REVIEW ON PEDAL OPERATED HACKSAW WITH ELECTRICITY GENERATION

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Abstract – In this Pedal operated hacksaw machine which can be used for industrial applications and Household needs in which no specific input energy or power is needed. This project consists of a crank and slider mechanism. In the mechanism pedal is directly connected to the hacksaw through crank and slider mechanism for the processing of cutting the wooden blocks, metal bars, pvc materials. The objective of the modal is using the conventional mechanical process which plays a vital role. The main aim is to reduce the human effort for machining various materials such as wooden blocks, steel, PVC etc. The power hacksaw machine, which runs on human power, works on the principle of the conversion of rotational motion to oscillatory motion. Importance of this project lies in the very fact that it is green project and helps us to reduce our electricity need. Secondly, this cutter can be used and transferred to our working place easily. Moreover, if we want we can generate electricity with our project by connecting it to dynamo, diode and battery.

Key Words - Pedal, Hacksaw, Electricity, Crank and slider mechanism.

I. INTRODUCTION

Pedal power is the transfer of energy from a human source through the use of a foot pedal and crank system. This technology is most commonly used for transportation and has been used to propel bicycles for over a hundred years. Less commonly pedal power is used to power agricultural and hand tools and even to generate electricity. Some applications include pedal powered laptops, pedal powered grinders and pedal powered water wells. Some third world development projects currently transform used bicycles into pedal powered tools for sustainable development. This project concentrates on pedal powered hacksaw machining. An individual can generate four times more power (1/4 HP) by pedaling than by hand- cranking. At the rate of ¼ HP, continuous pedaling can be served for only short periods, approximately 10 minutes. However, pedaling at half this power (1/8 HP) can be sustained for close to 60 minutes but power capability can depend upon age. As a consequence of the brainstorming exercise, it was apparent that the primary function of pedal power one specific product was particularly useful: the bicycle. Many devices can be run right away with mechanical energy. A saw is a tool that uses a hard blade or wire with an abrasive edge to cut through softer materials. The cutting edge of a saw is either a serrated blade or an abrasive. A saw may be worked by hand, or powered by steam, water, electric or other power. An abrasive saw uses an abrasive disc or band for cutting, rather than a serrated blade.

II. PROBLEM STATEMENT

Pedal hacksaw are used in mechanical and allied industries

which cuts pipe made of different materials. The Pedal hacksaw machine is widely used in piping industries or in scrap dealers' shop to reduce the volume of the storage. Consequently, it leads to the reduction of the transportation cost. This machine is primarily used to save space and for cutting. It can be placed anywhere.

III. OBJECTIVES

The main objectives of the project are-

- To fabricate a simple and easy to use Pedal hacksaw machine involving low cost of construction and easily movable from one place to another.
- To reduce the efforts
- To manufacture low effort pedal operated Pedal hacksaw

IV. LITERATURE REVIEW

1) B.P.Numbi, X.Xia and J. Zhang, have presented an optimization technique for the vertical Pedal hacksaw. The paper presents the optimal control model to improve the operation efficiency of a vertical shaft impact Pedal hacksaw. They have proposed optimum methods to reduce the power consumption by varying the conveyor feed flow rate, the vertical shaft impact crusher rotor feed rate and the bi-flow or cascade flow rate.

2) Department of Design and Technology, Loughborough University, has presented a paper emphasizing the need for recycling the wastes particularly the metal can wastes. The paper insists that the requirement for environment accountability has become a feature of consideration for the engineers, especially for mechanical engineers. The various design methodologies have been discussed in the paper for the construction of a Pedal hacksaw which would be helpful in waste management.

3) M.Lindqvist and C.M.Evertsson, Department of Applied Mechanics Chalmers University Of Technology, Sweden have presented a paper to develop a wear model for the cone crushers which are used to crush the rocks minerals which are in the form of ores in mines. Disagreements between predicted and measured geometry and several effects were suggested to explain the discrepancy in the model. The model is of complex construction and it has some of the real time shortcomings which reduces the efficiency of the machine drastically. The various drawbacks have been studied and the measurements have been done to predict the efficiency.

4) ZHAO La-la, WANG Zhong-bin and ZANG FENG of China

University of Mining And Technology, have presented a paper on the Multi-object Optimization design for differential and grading toothed roll crusher using genetic algorithm. The Pedal hacksaw blends the efficiencies of toothed roll crusher and also the jaw crusher to possess great Pedal hacksaw ability and high breaking efficiency. Crank rocker mechanism forms the basis of the machine. Thus the construction of the machine becomes complicated and as a result the cost of the machine increases.

5) OLALEYE B M Department Of Mining Engineering, Federal University Of Technology, Nigeria, has proposed a paper on Jaw Crusher performance in the granite quarry. The paper determines the Effect of Rock Strength on Crushing Time and Grain Size Distribution of the rocks. Investigation was conducted with five sample rocks and the performance and drawbacks were spotted out. Various testshave been performed and the results have been tabulated and plotted in the form of graphs

V. METHODOLOGY

Design of machine:-

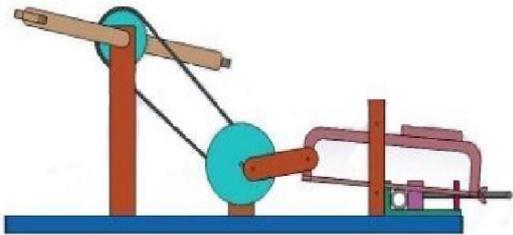


Fig. 1. Pedal Operated Hacksaw

COMPONENTS REQUIRED

- I. Hack saw blade
- II. Pedal arrangement
- III. Stand setup parts
- IV. Crank and slider mechanism
- V. Hack saw assembly
- VI. Metal slab

In our attempt to invent a machine for a specific purpose we adopted a more focused approach, the design work is divided into two parts in particular;"

PEDAL POWER HACKSAW-

The principle of pedal power hacksaw is to change circulatory motion or cycling motion into translatory motion with the help of metal cutting rod. This is mainly used for cutting metals and plastics. it is manually pedal operated system. If we use dynamo then we can produce electricity which will be help to lighting the work piece area when electricity is not available in mechanical workshop. A hacksaw is a fine- tooth saw with a blade under tension in a frame, used for cutting materials such as metal or plastics. Hand-held hacksaw consist of a metal arch with a handle, usually a pistol grip, with pins for attaching a narrow disposable blade. A screw or other mechanism is used to used to put the thin blade under tension. It is a fine tooth hand saw with a blade under tension. It is used to cut

metals and PVC pipes. It would be useful in many projects discussed on this site which used plastic pipes as materials. Blades of hacksaw are measured in TPI (Tooth per Inch). Different TPI is needed for different jobs of cutting.

CONCLUSION

Thus a low cost can enhance day today household needs and daily day to day purposes and it can be also and simple design pedal operated hacksaw machine is fabricated. This machine reduces the human effort and hence we don't need two persons to cut the wooden logs. This simple design of conventional design which used in for industrial applications during power shut down scenarios. By using this method we can do any operation as per our requirement without the use of electricity. So we can save the electrical power.

VI. REFERENCES

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