Design and analysis of four way hacksaw machine

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ABSTRACT

Metal Cutting Process by means of a hacksaw is quite a longer processin the Industrial fabrication Sector. Manpower, Electrical Power as well as a lot of time is consumed in the Metal Cutting Process by using a Single Hacksaw Machine. Mostly, the products that are obtained after the process in the Hacksaw machine are directly or indirectly the raw materials in any small scale industries or even in large scale industries. Usually observation in a workshop is found that the Hacksaw Machine cuts only one specimen from the raw material and even a worker is employed to change the raw material at regular interval. But, the output obtained is comparatively less. In accordance to the demands, there arises a sharp need to increase the productivity. In response to this issue of high productivity requirement. a new concept can be employed to increase the cutting of metal by utilizing the power of a motor to function Four Hacksaw simultaneously. This paper review on the Quadra hacksaw machine.

Keyword: - *Hacksaw Quadra , motor , governing motor*

1. INTRODUCTION

A hacksaw is a fine-tooth saw with a blade under tension in a frame, used for cutting materials such as metal. Hand-held hacksaws consist of a metal frame with a handle, and pins for attaching a narrow disposable blade. A screw or other mechanism is used to put the thin blade under tension. The blade is pressed against the work piece and reciprocates at rates by connecting link. This forces the cutting edge against the work piece, cutting off chip (discontinue) from the hole as it is hacksaw. A hacksaw is a fine-toothed saw, originally and principally for cutting metal. They can also cut various other materials, such as plastic and wood; for example, plumbers and electricians often cut plastic pipe and plastic conduit with them. There are hand saw versions and powered versions (power hacksaws). Most hacksaws are hand saws with a C shaped frame that holds a blade under tension. Such hacksaws have a handle, usually pistol grip, with pins for attaching a narrow disposable blade. The frames may also be adjustable to accommodate blades of different sizes. A screw or other mechanism is used to put the thin blade under tension. It is a very obvious fact that the cutting process will definitely lead to heating of blade so to avoid overheating in case of Stationary models of Power hacksaws; a specific mechanism is employed in which the blade is lifted up in the return stroke with a view to have a smoother return stroke. Many power hacksaw use a coolant that is pumped at the point of contact of work piece and Hacksaw blade to reduce friction and overheating at large This machine, being perfect enough to overcome the drawbacks of the conventional machines is enough cost efficient so to be easily affordable by the entrepreneur of small scale industries as well as that of large scale one. Moreover, the chances of blade damage would be quite less as compared to that of the conventional

machine which adds additional benefits to the profit to the manufacturing sector along with the main supreme aim fulfillment of increment of productivity.

1.1 Solid hacksaw frame:-This is a particular kind of Hacksaw frame in which a defined standard length of Blade can be fitted. Blades of any length cannot be fitted. The required length of blade is usually specified on the frame. As it is no accepting one to variant length of blades, it is termed as the Solid Hacksaw Frame. The below figure is the Solid Hacksaw Frame**.**

1.2 Adjustable hack show frame

The following category of Hacksaw frame can accept a varied range of\different standard length of blades. Ranging from a small length to a limited long length of blade can be easily fitted adjusting the frame body. This adds to the benefit on expenditure done on Solid Hacksaw Frame where each and every length of blade requires a separate frame. This feature of acceptation of discrete standard length of blades by means of frame body being made adjustable leads to be named as Adjustable Hacksaw Frame. The figure succeeding is the pictorial representation of the Adjustable Hacksaw Frame.

2. LITERATURE REVIEW

2.1 Performance analysis of pedal powered multipurpose machine

Energy is the most vital aspect in the development of modern technological civilization. The conventional energy sources are being very scarce, so alternative energy sources are found which must be cheap, easily available and must satisfy the technical requirements. In the present work, a human powered multipurpose machine is developed which lifts water to a height 10 meter and generates 14 volt, ampere of electricity in most effective way. Power required for pedaling is well below the capacity of an average healthy human being. The system is also useful for the work out purpose because pedaling will act as a health exercise and also doing a useful work

2.2 Fabrication of pedal powered hacksaw using dual chain drive

Fabrication of pedal powered hacksaw using dual chain drive is used for industrial applications and it does not any specific input energy or power is needed. It consists of sprocket arrangements, crank, slider bar mechanism and chain drive. Chain drive is a directly connected to the hacksaw for the process of cutting the wooden block. The main aim of the project was to reduce human effort. It was concluded that the machine reduced human effort at lower cost. It can be used for household activities also when there is power shut down scenarios.

2.3 Experimental Investigation of Pedal Driven Hacksaw

The objective of this paper was to design, fabricate and experimentally investigate the working of Pedal Driven Hacksaw (PDH). PDH is working on Slider Crank Mechanism. The experiment was done using PDH and plywood pieces. The main parts of PDH are hacksaw, reciprocating rod welded to the pedal of a bicycle, flywheel, sprocket and chain drive. The hacksaw is connected with the reciprocating rod. By pedalling the bicycle, the reciprocating rod moves to and fro, the hacksaw will be moving with the rod. The plywood to be cut is placed under the hacksaw. Thus, the plywood can be cut without any external energy like fuel or current. Since, this uses no electric power or fuel, this is very cheap and best.

2.4Design and fabrication of pedal operated hacksaw

The pedal powered hacksaw machine is a device which is used for cutting wood, plastic and metals. This works on the principle of slider crank mechanism which is inversion of four bar mechanism. In this rotary motion is converted into reciprocating motion. It was verified by cutting metal pipes, plastic in the hacksaw by pedalling action. It was convenient, easier and more eco-friendly

2.5 Design and Fabrication of human powered wood cutting machine

Design and fabrication of human powered wood cutting machine is used for cutting wood which gives less effect of man and commonly used where there is no power supply. This design ensures a smooth operation during cutting process. The cutting forces were provided by means of chain drive, gear assembly and other kinetic mechanism. This machine was used for heavy duty wood cutting process. Experimental setup showed that the maximum depth obtained was 17mm in one cycle of strokes for around 1000rpm. It gives better, accurate and faster cuts when compared with hand hacksaw at different rpm. It can be used in remote places where electricity isn't available for daily base. It had designed as portable one which could be used for cutting at many places. Since it is used no electricity or any fuel, so it is very cheap and best

4. CONCLUSIONS

Metal Cutting Process by means of a hacksaw is quite a longer process in the Industrial fabrication Sector. Manpower, Electrical Power as well as a lot of time is consumed in the Metal Cutting Process by using a Single Hacksaw Machine. Mostly, the products that are obtained after the process in the Hacksaw machine are directly or indirectly the raw materials in any small scale industries or even in large scale industries. Usually observation in a workshop is found that the Hacksaw Machine cuts only one specimen from the raw material and even a worker is employed to change the raw material at regular interval. But, the output obtained is comparatively less. In accordance to the demands, there arises a sharp need to increase the productivity. In response to this issue of high productivity requirement, a new concept can be employed to increase the cutting of metal by utilizing the power of a motor to function Four Hacksaw simultaneously. This modified Metal Cutting machine would definitely increase the productivity Four Times the foresaid productivity. This Single Motor governing Quadra Hacksaw Machine will be observed and predicted to be sure to give overwhelmed results and solution to high productivity need.

5.REFERENCES

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