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Automated Power Double Hacksaw

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ABSTRACT: In this project work and effort has been made to develop a modernized two-way hacksaw machine and less stress full operations for cutting wood, metal and plastic materials. The aim of this work is to develop a hacksaw machine which can use less effort to provide uniform cutting of PVC pipes, metals, wood. it's also done to means the assembly difference between hands driven, pedal drive and two-way hacksaw machine. This model implies a change of rotation of crank to reciprocating motion of hacksaw blades, which is completed by using simple linkages. This motion is employed for hacksaw machines during this model we will operate two hacksaws at same time. This model will overcome traditional hacksaw machine which material cutting of single piece at a particular time intervals and also fulfills the need of more material cutting accounts to mass production. This machine works outstandingly with minimum vibrations and jerks. These machines will also do cutting of different materials; hence the purposed model of hacksaw machine will be welcomed by many industries due to compactness and efficiency. To achieve this goal the two-way hacksaw machine is developed.

KEYWORDS: Hacksaw, Material cutting, Hacksaw frame.

I. INTRODUCTION

Now a day's automation has changed the planet as we all know. we'd like more and more automated system to form human tasks faster and easier. So here we automate another arduous work of hacksaw cutting. Human hacksaw cutting is extremely strenuous and requires tons of effort. this is often not achievable large scale and precise cutting. So, our proposed organization automates the hacksaw trimming with twin sided methodology where we operate 2 hacksaws employing a These single assembly. We here apply a motor with shaft attached.

The motor and shaft are attach using appropriate mounts to possess it in place. Then we make use of a hacksaw frame and fabricate mounting panels for it using metal structure. We also use a bed and holder to carry the work piece in situ. Now we drive the motor employing a supply circuit to work it and move the shaft. We attach the shaft to saw frames during a way that saw moves during a direction perpendicular to the work piece. Attaching 2 hack saw in either direction allows us to work hacksaw in both directions and operate both of them at an equivalent time. Consequently, we place forth a wise and logical hacksaw which may be used for authentic bulk productions.

II. LITERATURE SURVEY

The immeasurable review of literature will assist to know the concepts, theorems and various elements affecting the performance of machine:

1. Dharma Chaitanya Kirtikumar:

In this paper we learn regarding the designed and developed a multipurpose machine which doesn't require electricity for various functions like cutting, grinding, etc. This is often a person's powered machine runs on chain drives mainly with human efforts. But if you wanted to work this machine by electrical power this machine also can does that. It's some special attachment so use both human powers also as electrical power. the planning is idle to be used within the developing world because it doesn't require electricity and may be built using metal base, chain, Pulley, rubber belt, pedal motor, chain socket.



2. R. Subash, K Samuel Jayakaran (2014):

In this paper author has invented pedal controlled hacksaw machine which may be operated for industrial operations and households needs during which no particular input energy or power is needed. This project involves of sprocket arrangement, crank and slider mechanism, and chain drive. Within the mechanism, chain drive is instantaneously linked to the hacksaw for the operation of cutting the wooden bar. The objective of the paper is using the traditional mechanical process which plays an important role. The foremost aim is to diminish the human trouble for machining various substance like wooden blocks, steel, PVC, etc.

3. Prof. Nitinchandra, R. Patel, and Ravi Thakkar:

In his paper "Material Selection and Testing Of hacksaw Blade supported Mechanical Properties" stated that the acceptable saw blade must be selected for better operation and fine cutting by selecting number of teeth per inch. There are two blades based on materials namely listed below:

- High Carbon Steel
- Alloy Steel
- Bi-Metallic Strip
- High Speed

Out of these four, best suitable for cutting hard materials like low-carbon steel bar and aluminium is bimetallic blade on the idea of properties of materials, wear resistance and cutting performance.

4. Historical Background:

The trouble of cutting-off material to particular dimensions is familiar to practically each and every industry. Often, sawing is that the first operation administered on bar stock. Therefore, it's surprising that so little work has been done to know the issues of this common operation. Many reasons are given for this like lack of interest, it's a routine operation which there's no got to consider better methods. Often the foreman will assign a replacement trainee to a sawing task, on the principle that it's easy to find out and difficult to botch. Furthermore, cut-off machines are frequently housed in stores faraway from the most production areas and therefore the operation of the stitching machines appears to be simple. The very fact remains that cutting-off operations can account for a big part of the value per piece (Remmerswaa and Mathysen, 1961). The rationale for completing this work is that the growing realization on a part of manufacturers of both blades and machines, that the factors which control the mechanics and economics of power hacksawing are complex. Also, power hacksawing has been receiving increased competition from other isolating processes, like band and circular dimensions etc. The quality relates to testing of hacksaw blades for hand use only and doesn't include power hacksaw blade testing. Therefore, both manufacturers of hacksaw blades and users have suffered from significant problems in establishing standard testing procedures and in achieving steadiness in test data using power hacksaw machines. Preliminary investigations by the author have revealed that existing blade testing methods weren't independent of the machine characteristics, which could contribute to at least one of the explanations for the inconsistency within the test data. Hence, there has been requirement to spot the machine characteristics under normal working conditions and to research the mechanics of the sawing process and therefore the variables affecting metal removal rate. Most of the first published work on cutting-off has been primarily concerned with circular and band sawing and price comparisons between alternative processes. Whilst these alternative operations are frequently, quicker than power hacksawing, their prices are in many applications taller, whilst the impact of these alternative processes on the appliance of powered hacksawing can't be denied there remains a big field of application for power hacksawing which is probably going to stay unchallenged. A component of prime interest to manufacturers is that, if the worth of power hacksawing are often decreased by developing the blade and thus the saw machine, the potential field of application are becoming to be widened. During the past fifty years small or no curiosity has been dedicated to developing the figure of the hacksaw blade or the gadget, although, some improvements within the blade material, in conjunction with methods of applying the load and mechanized work handling, are achieved (Nelson, 1965).

III. OBJECTIVE

The objective of this work is to automate the traditional power hacksaw machine so as to realize high productivity of work-pieces than the facility hacksaw machine employing a Double hacksaw blade. The operator needn't measure the length of the work-piece that's to be cut. The machine feeds the work-piece with the assistance of a shaft, which is driven by a DC motor. A DC motor is employed to cause the reciprocating motion required for cutting the work-pieces. With the assistance of this multi-way power hacksaw machine, the four metal bars are often cut simultaneously to urge the high-speed cutting rate and to realize production for max profit in related companies. This project is extremely much useful and straightforward to put in by the user and also the motor used won't only operate with the assistance of electricity but also through conventional source of energy like solar power.



IV. DESIGN METHODOLOGY

1. AC Geared Motor

An AC motor is an electrical motor driven by alternative current (AC). The AC motor primarily contains of two basic parts, an outside stator having coils provided with alternative current to provide a rotating magnetic flux, and an indoor rotor joined to the output shaft generating a second rotating magnetic flux. The rotor magnetic flux could even be produced by permanent magnets, reluctance saliency and DC or AC electrical windings.

2. Base frame-

It is the main components, on which all the parts, linkages are mounted. It supports the hole mechanism.

Quantity: 1

Height: 380mm

Length: 1300mm

Width: 420mm

3. Tray-

To collect the burr, wooden particles from the cut work piece tray is used. It can easily remove or refit when required. Due to that the burr cannot be fall on ground.

Quantity: 2

Height: 20mm

Width: 240mm

Thickness of sheet: 1.5mm

4. Sleeve-

Length: 50mm

Diameter: 2mm

5. Connecting link:

Quantity: 2

Length: 250mm

Width: 20mm

Thickness: 4mm

6. Guide ways-

Quantity: 2

Length: 310mm

Height: 40mm

Width: 70mm

7. Strip for sleeve-

Quantity: 1

Length: 200mm

Width: 40mm

Thickness: 5mm

8. Covering box-

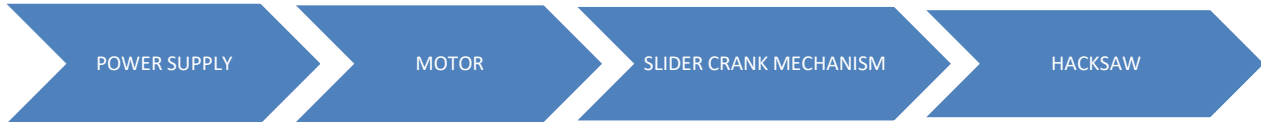
Quantity: 1

Length: 450mm

Width: 175mm

Height: 140mm

V. WORKING



When the electrical supply is given to the motor, motor start rotating on the shaft of the motor, the sleeved is fitted on which the plate is fitted by screw is start revolving with it.

The linkages are start moving forward and reverse direction. The rotary motion of the motor is connected into reciprocating motion. The speed of the motor can be control or minimize the using regulator.

MECHANISM INVOLVED IN MOTION TRANSFORMATION

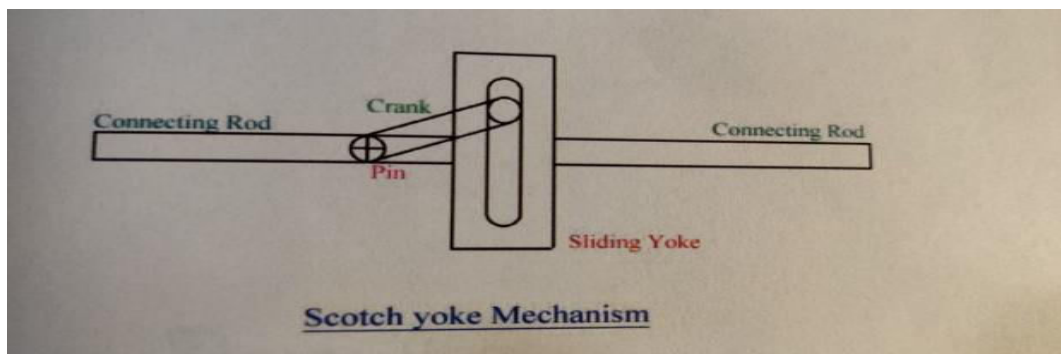
1.Scotch yoke mechanism working principle Basic of scotch yoke mechanism-

It is one of reciprocating motion mechanism, it should be converted a rotary machine into sliding of liner motion.

When the piston of reciprocating portion is directly coupled for the sliding of yoke carrying a slot.

That engages pin at reciprocating part. When the interior combustion engine to rework rotation into linear motion by means of crankshaft rotation.

Where the piston and connecting rod should be linked together. The Scotch Yoke Mechanism to be consider for more efficient thanks to rational motion to spent longer at point of it rotate than piston part.



2.Working principle of scotch yoke mechanism

It is a simple mechanism the rotary motion of pin converts into linear motion. First, the facility supplied should be joined to DC motor, when the shaft to start out in rotation moment, now the crank rotates the pin slider inside yoke part in also move forward direction. When the crank is becoming to be rotate in clockwise direction and yoke are becoming to be getting displacement moment at forward. the utmost displacement of yoke depends upon the length of the crank.

The crank is finished the clockwise Revolution at an equivalent occasion the Yoke sliding completely moved in forward. When this position takes longer to start out return stroke. After hung out, the crank is going to be rotate in continuously it to be come in initial position of rotation. So, the Yoke move in backward direction and are available back for initial position. Therefore, the crank has full Revolution to be finished, at the corresponding time the Yoke are getting to be complete the forward and backward progress of Sliding. By means of the full revolution of Crank, the Yoke will be sliding through equal of double length of Crank. The Yoke displacement can be maintained by increasing of crank length.

ADVANTAGES:

1. Simple in construction.
2. Weight of machine is less.
3. It reduces the work of labour.
4. High production rate.
5. Cost is less.
6. Easy maintenance and maintenance cost is less.
7. Two cutting at a time.



LIMITATIONS:

1. Time consume is more.
2. Speed variations is required for cutting the different materials.

APPLICATIONS:

1. These machines can be utilized as a part of remote spots where power is customary. It is composed as a convenient one which may be utilized for cutting in several spots. It is often utilized for performing on materials like thin metals, wood.
2. In engineering industry.
3. In construction industry.
4. In workshops.

VI. CONCLUSION

It is known that standard hacksaw machines are many times replaced with automatic power hacksaw machine. Automatic power hacksaw machine offers great productivity briefly period of a while as compared with the average hacksaw machines. The main advantage of this machine is that intervention of labour is reduced to maximum level. During this rapid emerging industrial generation, the use of power Hacksaw instrument is wide. Time and labour play a serious role in production process this may be overcome by using this type of automatic machines. The automated hacksaw gadgets are often made use of at any of the industries like pump manufacturing industries that include bulk volume of shafts that need to be cut routinely. The range of size of work-pieces which may be cut utilizing the automated hacksaw machine are often varied by switching the blade size. Nowadays, the machine make use of 12inch blade for cutting.

VII. FUTURE SCOPE

The machine can be entirely automated by making use of Microcontroller. In fully automated machine the operator needn't measure the length of the work-piece that's to be cut and to load and unload the work-piece whenever after a bit has been cut.

The operator got to only enter the 2input namely the amounts of pieces to be cut and therefore the length of every piece that's required to be cut. The inputs are often given by the operator with the assistance of a keypad and an LCD display, which can help the user to verify the info given by him.

After acquiring the 2 inputs from the operator, the machine will automatically feed the given length of work-piece and begin to chop till the given number of work-pieces are going to be cut.

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