

KINEMATICALLY OPERATED NUMBER of HACKSAW

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ABSTRACT :

This project is a prerequisite for the plan and development of a number of metal saw that works kinematically to cut the metal with the help of hacksaw in various dimensions and lengths. The target of this project is to spare labor and time in cutting metals keeping in mind the end goal to accomplish high efficiency. This is the project based on kinematic linkage which is worked utilizing rotational motion and change over it into reciprocating motion. This project gives most likely method for production rate through cutting area. In the new changing period it is important to spare time in production process, it implies that create most extreme production rate in least time. The capacity of this machine in cutting productivity coordinating with this regions require in assembling process. This hacksaw machine consists four hacksaw blades. due to this four work pieces cut within one time and in exact number of cycles.

Key words: - Kinematics. Hacksaw. Linkage. Drive.

INTRODUCTION :

In order to fulfilling the needs of new changing era we developing updating structure in existing once machine to providing increasing production rate as desire this is the updating structure of paddle operated single hacksaw machine, here we uses no. of blades at a time and operating same in order to obtaining increasing cutting rate. This is the machine constructed in order to increasing production rate in cutting section. The name kinematically operated number of hacksaw indicating their meaning and their main point of working. Kinematics related to the motion of any object either it is reciprocating or rotational motion. Here we utilize slotted lever mechanism principle that is to converting rotational motion and converting it into reciprocating motion for obtaining cutting rate.

But in this machine we operate number of hacksaw at time at different stage for obtaining same cutting rate. The prime mover which is soul of this machines that providing rotation to

the other parts of the machine. These machines can cut bars of various material unequivocally at quick rate yet they can cut bars of one material at any given moment which implies they can't ready to cut different material at a same time. This project is useful for the cutting of wood, metal, pipe, angle, channel, and many other things. It is easy to install by the user and most useful in order to obtaining maximum cutting rate. With help of this machine we can cut four bar of same material at same time, so it providing maximum cutting rate in less time, it reducing time of cutting and utilizing power in more profitable manner.

LITERATURE REVIEW

O. Cakir, Et. Al. (1) Explained in his research paper "selection of fluid in machining operation" in a machining operation high temperature in a cutting tool results due to friction between work piece and cutting tool and cutting tool chip interface. There are some effects of this generated heat which are higher surface roughness, shorter tool life and lower the dimensional sensitiveness of the work material. This result is more important when there is need to machining harder material which is difficult to cut due to high heat production.

R.Subhash (2) In this Paper, 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 sprocket arrangement, the crank and slider mechanism, the chain drive. In the mechanism, chain drive is directly connected to the hacksaw for the processing of cutting the wooden blocks. The objective of the paper 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.

Nitinchandra R. Patel (3) Testing of different material blades like High Carbon Steel, Low Alloy Steel, Bi-metallic blade, High speed Steel blades for their hardness, cutting time performance, Wear Resistance, Tensile Strength and performance under buckling. Experiment of Rockwell Hardness tester for getting Hardness Number on C-Scale for all different types of blades, so their relative hardness of teeth of different blade blades can be compared.

Key component:-

Sr. No.	Component Name	Material
1	Chassis	CI
2	Prime Mover	DC Motor
3	Chain & Sprocket	Steel
4	Bevel Gear	Plain Carbon Steel
5	Shaft	Steel
6	Saw's Plate	Steel
7	Linkage's	CI
8	Universal Coupling	Steel
9	Hack Saw Frame	CI
10	Actuator	Steel
11	Holding Device	Steel

PRINCIPLE

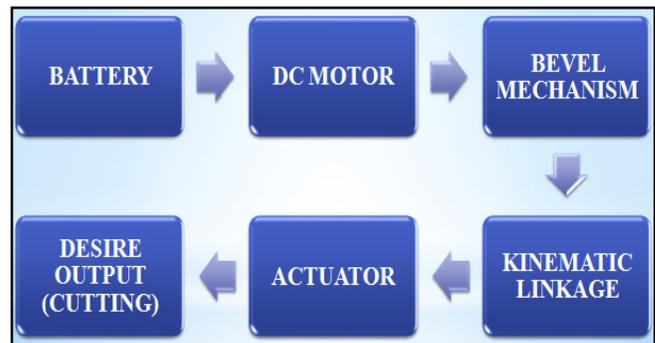
Kinematically operated hacksaw machine which is replace modal of paddle operated machine for increasing production rate in less time period. Machine having their own principle that are

1. It is the machine which can handle no of job for cutting purpose.
2. Kinematically operated machine converting rotary motion in to the reciprocating motion for obtaining output.
3. It uses bevel mechanism which is responsible for motion conversion.
4. It has number of holding device which is able to hold the job at their align position.

CONSTRUCTION

- The assembly of whole machine must be mandatory to connect all the parts with perfect alignment.

- Mounting is the fixing of parts with their design position.
- In kinematically operated hacksaw machine all the parts are joint as per their design sequence
 1. The prime mover has been mounted in order to producing design velocity
 2. Chain and sprocket are arrange in the sense that they transmitting possible velocity towards bevel mechanism which converting possible rotation to torque as requiring for material cutting purpose.
 3. The bevel mechanism which assemble with pedestal bearing with steel shaft having certain shape which is assemble with having bevel crown at lower end and circular saws plate at another end.
 4. All the linkages which shape in certain order and connecting their one end to saws plate with the help of locking stud and another end connecting to hacksaw blade frame.
 5. The hacksaw blade frame which is mounted on main actuator in order to reciprocating in particular sequencing order.
 6. The frame which is reciprocating on cylinder with the help of piston in the form of gudgeon pin.
 7. Hacksaw blade which is connecting to frame for better cutting.
 8. The job which has to be cut with better dept of cut so, it must be mandatory to hold in fixed state in order to have no movement during operation.
 9. Fixed jaws are arranging with perfect alignment on which material has been holding. The jaws must be able to withstanding high cutting force



BlockDiagram Of Kinematically Operated Number Of Hacksaw

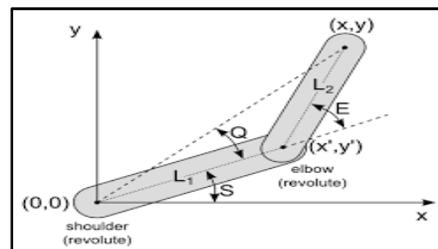
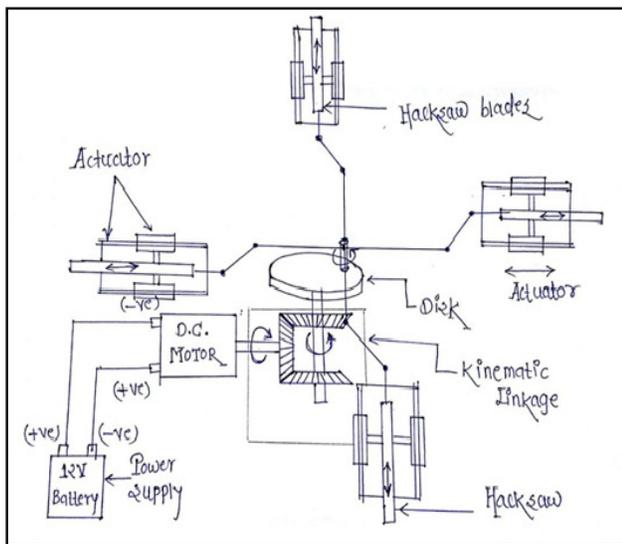


Figure No. Friction between Joints

2 the

WORKING

1. It is a machine which utilized kinematic principle in order to perfect motion conversion.
2. The name kinematically operated number of hacksaw describes its state of working.
3. Kinematics is the branch of mechanics in which motions are transmitted without applying any forces.
4. In this machine the rotary motion from prime mover transmitted through bevel mechanism and converted into reciprocating motion via kinematic linkage.
5. The final reciprocating motion must be converted into desire arrangement called actuator.
6. Actuator is a simple piston arrangement which provide the desire work in the form of cutting.
7. All the linkage must be higher pair or lower pair they are move on their fixed axis according to the requirement.
8. The bevel mechanism which consists of pinion and crown attached with circular shaft which responsible for motion conversion and it also preferred for reducing direct load on motor.



Line diagram of kinematically operated number of hacksaw

SPECIFICATION

Sr. No	Component	Specification
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1	Motor	DC, 100 watt, 2800 rpm
2	Pedestal Bearing	No. P205
3	Circular Plate	Dia. 180 mm
4	Bevel mechanism	Crown = 16 teeth Pinion = 10 teeth
5	Hacksaw Frame	300 mm length
6	Shaft	Dia. = 20 mm Length = 280 mm
7	Actuator	Piston Dia. = 12 mm Cylinder Inner Dia. = 14 mm Outer Dia. = 20 mm
8	Kinematic Linkage	Length = 235 mm

Modeling Of Kinematically Operated Number Of Hacksaw

1. It is useful know the friction between all the parts which gives us partial thought about the load, mark of output, etc.
2. The machine must be work very smoothly but its hacksaw which having degree of freedom is two means it get reciprocate linearly.
3. Here, four piston and cylinder are used in order to managing complete stroke in linear direction. Each hacksaw which perform one working stroke and one ideal stroke in each revolution.
4. It is important that which type of software used, basically auto-cad used as design software for designing this machine kinematically operated number of hacksaw.
5. We used direct control motor with 2800 rpm and power capacity is 100 watt for initial drive which providing possible rotation for torque conversion through bevel mechanism.
6. Here, machine run in motion with respect to drive given by direct current motor, so it drive no of hacksaw at a time for greater rate of cutting.
7. Here we used bevel mechanism so it consists of two pinion and one crown which is responsible for accurate torque converter from initial to desire output.
8. Here we used power transmission angle as 90 degree perpendicular to working stroke.

CONCLUSION

1. Kinematically operated hacksaw machine is nothing but progression of kinematic link.
2. It is important technology will acquiring more scope.
3. It improved the kinematics result of all linkages that responsible for movement.
4. It gives the important of kinematic linkage.
5. It can drive with more stiffness than previous machine.
6. Cutting rate moderate

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