

Jig Saw Machine

Prof. Anirudha Darudkar¹, Chetan Nirapure², Tilak Farkase³,
Tanupriya Choukikar⁴

¹Professor, Dept.of Mechanical Engineering , Shri Balaji Institute Of Technology & Management,Betul
,Madhya Pradesh ,India

^{2,3,4}Student , Dept.of Mechanical Engineering , Shri Balaji Institute Of Technology & Management,Betul
,Madhya Pradesh ,India

Abstract - "The Jig Saw Machine" as a project work, it has helped us to understand the wood cut working, by all of the view like about its working capacity, the product which will it produce, what will be the difficulties in working of the machine, kind of safe working, working reliability, number of operations that can be performed with this machine.

Key Words: Frame, Saw, Cutter , Motor , Bearing.

Date of Submission: 01-05-2023

Date of Acceptance: 10-05-2023

I. INTRODUCTION

A Jig saw is a one type of a saw, which cut the wood in different shape. It cut different shape with finishing. It workson stock of blade. The blade is cut profile cutting, curves circle and other complicated part. It works on slides .the mechanism is crank rod link mechanism. This mechanism gives up & down motion to blade. We use pulley in proper ratio to control rpm of motor. And finally this machine is cutwood precisely with finishing. As the work-shop is having mechanical work press, it is also feasible to make the partsas dimension & working point of view. So it may prove an additional advantage of having such kind of machine.

Properties Of Material:

The material selected must possess the necessary properties for the proposed application. The various requirements to be satisfied can be weight, surface finish, rigidity, ability to withstand environmental attack fromchemicals, service life, reliability etc.

The following four types of principle properties ofmaterials decisively affect their selection

1. Physical
2. Mechanical
3. From manufacturing point of view
4. Chemical

The various physical properties concerned are melting point, Thermal Conductivity, Specific heat, coefficient of thermal expansion, specific gravity, electrical Conductivity,Magnetic purposes etc.

The various Mechanical properties Concerned are strength in tensile, compressive shear, bending, torsional and buckling load, fatigue resistance, impact resistance, elastic limit, endurance limit, and modulus of elasticity, hardness, wear resistance and sliding properties.

Working Principle:

The jig saw machine is a mostly use for wood cutting. Various types of operations on wood by this machine. Like straight cutting, profile cutting, curves, circular holes and decorative cuttings are obtained by this machine.

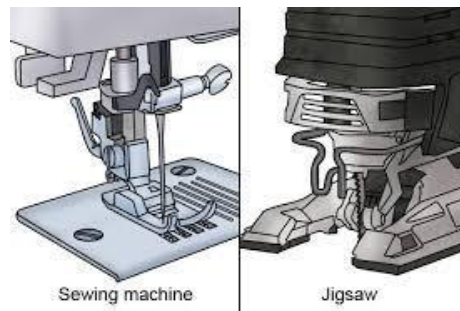


Fig.Jigsaw

A system and method of cutting a profile along a linear edge of a wooden work-piece utilization two space-a part rotating cutting tools whose cutting edges mirror one another and which are mounted for rotation about parallel axes.

This invention related generally to the removal of material from a workpiece possessing grains or other pattern of fibrous tissue such as a wooden work-piece and related more particularly to means and method for cutting a profile, or crop, along the edge of such a work-piece.

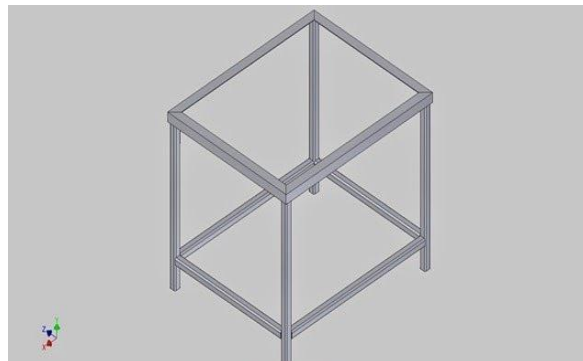
II. Components and Description

Following are the main components are used in this project:

- a. Frame
- b. Saw
- c. Cutter
- d. Motor
- e. Bearing.

1. Frame :

Frame provides support to all mounted parts on it.



2. Saw:

Saw is the main cutting element which is used in cutting operation.



Fig.Saw

3. Cutter:

A circular cutter is a power-saw using a toothed or abrasive disc or blade to cut different materials using a rotary motion spinning around an arbor. A hole saw and ring saw also use a rotary motion but are different from a circular saw. A circular saw is a tool for cutting many materials such as wood, masonry, plastic, or metal and may be hand-held or mounted to a machine.



Fig.Cutter

04. Motor:

An electric motor is an electrical machine that converts electrical energy into mechanical energy. The reverse of this is the conversion of mechanical energy into electrical energy and is done by an electric generator, which has much in common with a motor.



Fig. Motor

05. Bearing:

A bearing is a machine element that constrains relative motion to only the desired motion, and reduces friction between moving parts. The design of the bearing may, for example, provide for free linear movement of the moving part or for free rotation around a fixed axis; or, it may prevent a motion by controlling the vectors of normal force that bear on the moving parts.



Fig. Bearing

III. Advantages and Applications:

ADVANTAGES:

- 1 It requires simple maintenance cares
- 2 Checking and cleaning are easy, because of the main parts are screwed.
- 3 Handling is easy.
- 4 Manual power not required
- 5 Repairing is easy.
- 6 Replacement of parts is easy.

APPLICATIONS:

It can be used to make both straight and curved cuts in a wide variety of materials, including wood , particleboard , plywood , plastic , metal etc.

IV. CONCLUSIONS

This project work has provided us an excellent opportunity and experience, to use our knowledge. We gained a lot of practical knowledge regarding, planning, purchasing, assembling and machining while doing this project work. We are able to understand the difficulties in maintaining the tolerances and also quality.

REFERENCES

- [1]. R.K.Bansal, Pascal, A Text Book of Fluid Mechanics and Machinery, Laxmi Publications, New Delhi, 2000.
- [2]. R.S. Khurmi, J.K. Gupta, 14th Edition. Machine Design, S. Chand & Company Ltd., New Delhi, 2000.

Prof. Anirudha Darudkar, et. al. "Jig Saw Machine." *International Journal of Engineering and Science*, vol. 13, no. 5, 2023, pp. 08-11.