

Fabrication Of Manual As Well As Motor Operated Wood Splitting Machine.

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Abstract- Wood and wood splitting technique are known to mankind from ancient time and they are constantly changing and highly customizable as per the dimensional requirement and urgency of need. To propagate the use of machinery for this basic and essential but frequent function of splitting a wooden log and this making efficient use of time and resources available the simple but essential project id

Index Terms- Power screw, DC motor, Fracture mechanics, shear force , solar plate, Battery.

I. INTRODUCTION

Around 2000 B.C. the Egyptians used wood to make furniture, such as beds, tables, chests, and many other items. Wood has been used by every civilization in the world, and is still used today to make manufacture paper, furniture, buildings, and a huge variety of everything else(5).

There are various kinds of splitters available in the market, still there is a lot of scope and market area to be covered; people in rural India are not used to machines for splitting wooden logs, rather they make use of traditional methods and manual energy like hand and axe.

Wood splitting machine work on the principle of FRACTURE MECHANICS. In operation of splitting the wooden logs the fracture in the wooden log are applied with shearing force and due to external force the wooden log is split into small piece. This machine utilize the shear force induce from the tool to split into parts.

II. OBJECTIVE OF PROJECT

- To eliminate excess worker from machine and making him free for any other operation. To reduce workers fatigue and manual work.
- To split wooden logs for firewood purpose.
- To replace the use of axe.
- To split logs faster and continuously.
- To split all kinds of logs-dry, wet, with knots etc.

- Two-way splitting will be obtained which in turn will increase the production rate of split wooden logs.
- To make process simple

III. FINAL DESIGN OF MECHANISM

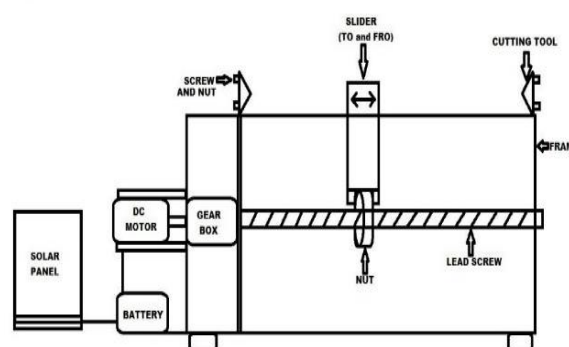


FIG:BLOCK DIAGRAM OF WOOD SPLITTING MACHINE

IV. CONSTRUCTION

Wood splitting machine consists of following main components;

1. DC motor (1/2 HP)
2. Battery (12 V)
3. Gear box
4. Power screw

4.1 DC motor:

A DC motor is any class of rotary electrical machines that convert direct current electrical energy into mechanical energy. Its specification is Input 230V AC, Output 0-180V DC.



Fig. DC motor

4.2 BATTERY

Battery is a storage device.

Battery is used as a power source.

4.3 GEAR BOX

Gear box is the equipment that transmits mechanical power. The use of gears in most of the equipment gives you control over torque, speed and synchronisation, and their use in machine is no exception. When you machine different materials, even if the geometry of the job is similar, you would generally have to use different speed and feed values for an optimized machining process. And this is where gear box comes into picture.

4.4 POWER SCREW

A power screw is a drive used in machinery to convert rotary motion into linear motion for power transmission. It produces uniform motion and the design of the power screw may be such that either the screw or the nut is held at rest and the other member rotates as it moves axially.



Fig. Power screw

Advantages of power screw are as follows:

1. A power screw is simple to design.
2. The manufacturing of power screw is easy without requiring specialised machinery. Square threads are turned on the lathe.
3. A power screw provides large mechanical advantage.
4. A power screw gives smooth and noiseless service without any maintenance.
5. There are few parts in a power screw reduces cost and increases reliability

V. WORKING

- The machine works on principle of FRACTURE MECHANICS.
- Fracture mechanics is the field of mechanics concerned with the study of the propagation of cracks in materials. It uses methods of analytical solid mechanics to calculate the driving force on a crack and those of experimental solid mechanics to characterize the material's resistance to fracture

VI. CONCLUSIONS

By successful completion of the project we can eliminate the shortcomings of the one way acting machine. The two way acting machine will cut two work piece at the same time reducing the amount of time.

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