Volume : 3 | Issue : 11 | November 2014 • ISSN No 2277 - 8179

Research Paper

Solar Power Drill

Engineering

KEYWORDS : Hacksaw, Relative Motion, Kinematic Pair, Frame

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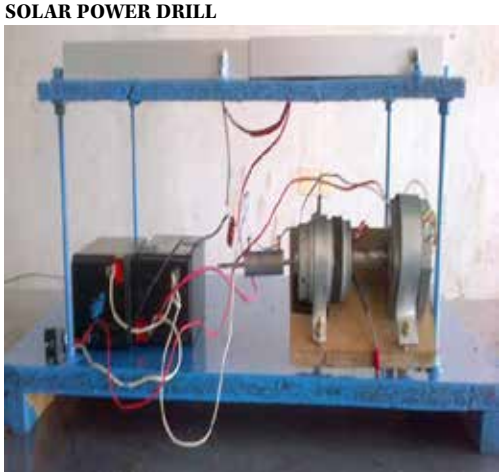
ABSTRACT

We designed and fabricated the solar power drill to reduce the power consumption with the help of solar panel by power drilling. Self-generating power by using stepper motor. With the help of solar energy the drilling is done. Generator is connected to the motor so that there produce more power. The fastener is used to tighten the drill bit.The attachment is gripped by a chuck at one end of the motor and rotated while on the switch against the target material. The tip of the cutting tool does the work of cutting into the target material.

introduction

SOLAR POWER DRILL



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INTRODUCTION OF MECHANISM

Drilling machine can be defined as an instrument which is used to drill holes. Drilling machine plays an important role in mechanical workshops.

The most important electrical device used in the project work is Stepper motor. Today stepper motors are widely used for many applications: particularly in the field of mechatronics & robots these motors are playing a major role. The stepper Motor used in this project work is indigenous one. The stepper motor is an easy and reliable device to convert electrical energy into mechanical motion. Since each input change causes exactly one step rotation, a stepper motor may be operated in an open loop system. Typical step angles are 0.9, 1.8, and 7.5

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Construction :

The drill bit is connected to stepper motor with the help of connector or the chuck and also with the help of fastener.Then the other side of the stepper motor is connected to the generator. So that there produce more power. With the help of a circuit boad the power is supplied from battery to the motor. This project is solar power drill. So here we use two solar panels. For the source of power.

Generation of power in stepper motor:

Stepper Motor can be defined as an electro Mechanical device that converts electrical pulses in to discrete Mechanical Motion as opposed to conventional Motors with free running shafts. A stepper motor is an incremental motion machine i.e. the motor, which turns in discrete movement(called the steps).The movement created by each pulse is precise and repeatable, which is why stepper motors are so effective for positioning applications.

Stepper motor does not rotate continuously, as a conventional motor does. The stepper motors operate on phase switched dc power. Basically two types of drives are used to operate stepper motors. In a bipolar drive, the direction of current flow through the winding will be controlled. In a uni-polar drive, the

Volume : 3 | Issue : 11 | November 2014 • ISSN No 2277 - 8179

center tap of each winding is used and connected to the power source. Switching either end of winding to ground then controls the current flow. When the winding is energized, each winding consumes 450 milliamps approximately. The stepper motors can be operated from very low speeds (0.01RPM) to high speeds (60 RPM) the performance of a stepper motor depends to a great extent on the control circuit used to drive the motor. The stepper motor used in this project work is capable to drive up to 5kg load i.e., the holding torque is 5Kg.In this project work unidirectional operation is considered.

WORKING OF PROJECT:

A drill is a tool fitted with a cutting tool attachment or driving tool attachment, usually a drill bit or driver bit, used for boring holes in various materials or fastening various materials together with the use of fasteners. The attachment is gripped by a connector at one end of the drill and rotated while pressed against the target material. The tip, and sometimes edges, of the cutting tool does the work of cutting into the target material. This may be slicing off thin shavings (twist drills or auger bits), grinding off small particles (oil drilling), crushing and removing pieces of the work piece (SDS masonry drill), counter sinking, counter boring, or other operations.

WORKING MECHANISM OF A STEPPER MOTOR

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FRONT view

TOP VIEW

CONCLUSIONS:-

Drilling machines or drill presses are one of the most common machines found in the machine shops/mechanical workshops. A drill press is a machine that turns and advances a rotary tool into a work piece. The drill press is used primarily for drilling holes, but when used with the proper tooling, it can be used for a number of machining operations. The most common machining operations performed on a drill press are drilling, reaming, tapping, counter boring, countersinking, and spot facing. These are quite common machines & available everywhere, but for specific applications we need special purpose drilling machines. Availability of these machines in our country is critical; we may have to import them, for which we have to spend lot of amount. In this regard it is essential to develop special purpose drilling machines indigenously; therefore this project work is taken up.

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