



SOLAR POWERED GRINDING MACHINE WITH FLYWHEEL

¹Nikhil Patil 1st, ²Vishal Bhangale 2nd, ³Nikhil Rane 3rd, ⁴Shubham Mahajan 4th, ⁵Rohit Jadhao 5th

¹²³⁴Students and ⁵Assistant Professor of
MECHANICAL ENGINEERING DEPARTMENT
PCET's NUTAN MAHARASHTRA INSTITUTE OF ENGINEERING AND TECHNOLOGY,
TALEGAON DABHADE, PUNE, 410507

Abstract: The variable of the current work is to frame and create solar power fueled auto charging grinding machine with flywheel which is applied for grinding any condition of things like round, square, and polygon. Grinding gadget is accustomed to grinding the one of a kind forms of material. The grinding gadget is became through the single level attractiveness engine. Hence our mission to be precise solar fueled auto charging grinding system with flywheel is a special type of System. As indicated by way of the form of material to be grind, the granulating device can be changed. This undertaking offers diffused elements of granulating specific shapes and sizes of segments. This system may be broadly related in all types of ventures. By means of differing the pulley sizes we are able to get a top of the line velocity of extra than 10,000 rpm if vital. The principle trade we need to make is to have a totally encased engine to preserve out coarseness. Inside the present paintings DC powered grinding machine which manipulate is drawn by way of the 12 volt DC Battery. This battery is charged via the solar power based totally board and the alternator which is coupled to the Grinding device shaft.

Index Terms – Introduction, Flywheel, Calculation and results, Conclusions, References, etc.

I. INTRODUCTION

Purpose of our mission is to build a solar grinding system with flywheel. It's miles used to grind the machining surfaces to extremely good end and accuracy. The precept parts of this attachment are predominant body, motor with bearings, batteries, drum and flywheel etc. So this task, solar twin powered grinding system may be very tons useful, since it is supplied with appropriate nice of power resources and simple operating mechanism. Sun and kinetic power restoration system, it refers to the mechanisms that recover the electricity that might usually be misplaced when reducing velocity through loading of grinding machine. The energy is saved in a mechanical structure and retransmitted to the crushing wheel for you to help the speed increase. There are chiefly two sorts of contraption - battery (electrical) and flywheel (mechanical). Electric frameworks utilize an engine generator incorporated in with belt transmission which changes over mechanical strength into electric strength as well as the other way around. As soon as the electricity has been harnessed, it's far saved in a battery and launched while it is required. This method reduces the power requirement of the gadget by 20% universal. As a result, battery and flywheel aggregate is the properly proper for this software. Inertial mass is accelerating to a completely excessive rotational pace and retaining the energy in the gadget as rotational electricity. The energy is changed again by utilizing by generator from the flywheel. Thus this machine is minimally use strength and supply lots higher electricity output and electricity efficiency. This machine is fabricated on the frame setup, where the compound rest. When the motor is on, the abrasive grinding stone and therefore the rotor wheel are rotated. When the daylight is incident on solar panel board, the panel board absorbs the heat energy from the sun and it converts it to the power and sends this to the battery for the storage provision. Solar power means all the energy that reaches the planet from the sun. Solar electricity is that the technology of converting sunlight directly in to electricity. It's supported photo-voltaic or solar modules, which are very reliable and don't require any fuel or servicing.

The battery gives the provision to the D.C motor which is paired to the generator and grinding machine with the assistance of belt drive.

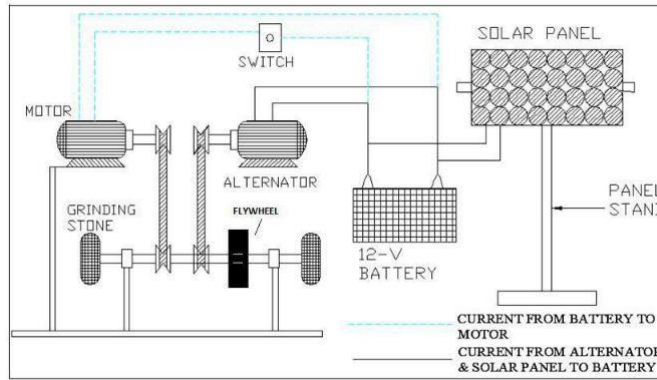


fig no.1: layout of solar powered grinding machine

Flywheel is also fixed on rotating shaft to reduce fluctuations and maintain the rotational speed also the energy is converted back by generator from the flywheel. Solar electric systems are suitable for lots of sun and are ideal when there is no main electricity. The release of the power from the battery will be equivalent to the charging of the battery by the sun based primary cell.

II. FLYWHEEL

The idea of a flywheel is as old on the grounds because the axe grinder’s wheel, however might at some points hold the key to tomorrow’s problems of efficient energy storage. The flywheel features a great achievements thanks to the recent accomplishment of high specific energy densities. A simple example of a flywheel may be solid, flat rotating disk.

A flywheel is an inertial energy-stockpiling device. It assimilates mechanical energy and it is filled in a reservoir, storing energy during the amount when the accessibility of energy is remarkable need and delivers it during the amount when the need of the energy is over the arrangement. The fundamental capacity of a flywheel is to smoothen out varieties inside the speed of a shaft caused by force changes. On the off chance that the source of the driving force or burden force is fluctuating in nature, a flywheel is here and there included. Several machines have load designs that make the force time function differ over the cycle. IC motors with one or two cylinders are a regular model. Cylinder blowers, punch presses, rock crushers, etc. are the opposite systems that have fly wheel.

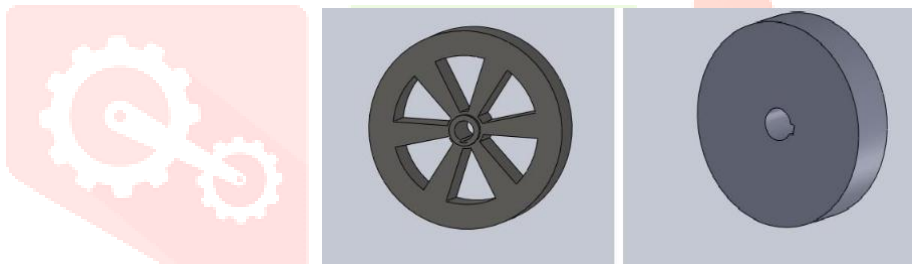


fig no.2: various profiles of flywheel

III. CALCULATIONS AND RESULTS

Flywheel kinetic Energy,

$$E_f = \frac{1}{2} * I * \omega^2$$

$$I = KMR^2$$

$$= 0.3 * 1 * (0.13)^2$$

$$= 0.00507 \text{ kg} * \text{m}^2$$

where, k is inertial constant

M is mass in kg

R is radius in meter

ω is angular velocity

$$\omega = \frac{2\pi N}{60}$$

$$= \frac{2\pi * 3100}{60}$$

$$= 324.631 \text{ rad/sec.}$$

Hence,

$$E_f = \frac{1}{2} * 0.00507 * 324.631^2$$

$$= 267.151 \text{ N * m}$$

We take the following readings of our projects:

RPM without the flywheel of Motor is 2700.

RPM with adding the flywheel is 3100-3200.

Avg Current requirements is 4.2 amp to 4.3amp.

As the flywheel is installed, avg current requirements is reduced to 3.6amp to 3.7amp.

Hence, the current requirement is reduced.

$$P = V * I$$

Without flywheel,

$$= 12 * 4.3$$

$$= 51.6 \text{ watt}$$

With flywheel,

$$= 12 * 3.6$$

$$= 43.2 \text{ watt}$$

IV. CONCLUSIONS

The Mission finished through us made an impressive project in the shaping works of all sorts of work piece. It's miles very beneficial for the small scale industries so that it will decrease the manufacturing price by means of enforcing the solar powered automatic grinding Machines to make shape of small factors after the machining manner and also the current requirement is reduced with the use of flywheel. This form of fixture is particularly used in production subject for grinding.

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