Design and Fabrication of Semi Automatic Crop Cutter with Hybrid Power

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***Abstract*:- Today, agriculture especially in india to concentrate in some situation such as how to increase the productivity and profit, how to reduce the cost and labor. To overcome these problems, this project work deals with "Design and fabrication of semi automatic crop cutter with hybrid power" this machine targets the small scale farmers who have land area of less than two acres. It is compact and can cut up to four rows of crops. It has cutting blades which cut the crop in a moving type of motion. It is operated by the hybrid power setup for cutting the crop. It run on wheel power transmission and motor. A collecting mechanism is provide for collection of crops to inside of the collecting tank with help of belt conveyor. This compact crop cutter is manufactured using locally available spare and thus, it is easily maintainable. Time required for cutting crop is main importance. The use of machines can help for cutting at proper stage of crop maturity and reduce operation time.**

Keywords: Crop Cutter, Power Supply, Cutting Blade, Solar Panel, etc.

1. INTRODUCTION

Our country has an agricultural background. Most of the people in our country depend on agriculture. General farmer's doing farming by traditional method. Thus it takes a lot of time and extra also required. The large scale as well as small scale farmers facing the problem of labor shortage. Crop cutting and
sequentially collecting is a last stage in farming which takes maximum time of farmer among all farming process. In india crop cutting and collecting is done by manually. Thus our aim is to provide a crop cutting and sequentially collecting machine which reduce the human effort and time required for cutting as well as collecting.

2. IMPORTANCE OF PROJECT:

This project is to help small scale farmers to fulfill demand and supply for market, by designing a crop cutter machine it cut the crop more easily. Our aim is on focus easy of cutting operation to the small land holders for cutting varieties of crop in less time and at low cost by considering different factors as power requirement , cost of equipment, ease of operation, time of operation. The operating, adjusting and maintaining principle are made simple for easy and properly handling by unskilled operators.

3. LITERATURE REVIWE

Akshay Komawar and et al; developed and performance on human powered crop cutter so that it ca easy harvesting in minimum period of time. It has bevel gear mechanisms which result in transmission of this manual motion in rotary motion of cutter at the end of which the crops get cut easily without any hard effect.
Sanjay Kulkarni and et al; this type of crop cutter, is cutting and working to full source get to the wheel pulley. So the crop cutting is slow moving and also cutting speed is reduced.

4. DESIGN OBJECTIVES

I. To manufacture a crop cutter operated on solar power for the ease of cutting crop at higher rate.
II. To simplify the complex driving mechanisms used in earlier project and giving it simple and high working capability.
III. To carry out complex crop harvesting easily and without emission.
IV. To achieve crop harvesting process at cheaper side.
V. Another object of the project was learning how to work the different parts of crop cutter and achieve its optimum working.

5. METHODOLOGY

The semi automatic crop cutter with hybrid power consist of a base frame supporting frame, DC motor, solar panel, switch, electric wire, battery, wheels and sharp blades. All this components are mounted on a frame, along with wheels are fitted to this frame. The movement of this harvester is done by pushing i.e. by using human powered. This crop cutter is highly efficient as it works on solar powered and it is affordable to small farmers due to its simple working. The advantage is it does not require any maintenance, easy to handle. Working of the crop cutter takes place step wise. The crop cutter comes to rest momentarily after each step. The seven steps of crop cutting are,

1. Battery connection gets ON.
2. By human effort move the cutter in desired direction.
3. Through the power of battery cutter starts rotating.

4. Cutter cuts the crop and collecting tank through conveyor.
5. Cutter cuts the crops and works desirably.
6. After discharging of the battery it is again charged with the help of charging adapter.
7. Battery can be also charge with the help of solar energy from solar panel

6. SOLAR FLAT

A solar flat plate collector collects heat by absorbing sunlight. A collector is a device for capturing solar radiation. Solar radiation form of electromagnetic radiation from the ultraviolet wavelengths.

Figure 1: solar flat

7. RECHARGEABLE BATTERY

Solar power can be stored in the rechargeable battery and can be further used for the grass cutting machine to run. A rechargeable battery, storage battery. It comprises of one or more electrochemical cell, and is a type of energy accumulator. It is known as a secondary cell because its electrochemical reaction are electrically reversible. Rechargeable batteries come in many different shapes and size, ranging from button cells to megawatt system connected to stabilize an electrical distribution network. Several difference combinations of chemicals are commonly used, including: lead-acid, nickel cadmium (NiCd), Nickel metal hydride, lithiumion (Li-ion) and lithium ion polymer.

Figure 2: Battery

8. DC MOTOR

In a brushed DC motor is an internally commutated electric motor designed to be run from a direct current power source.

Figure 3: DC motor

9. FRAME

Cast iron frame for the support of all subassemblies such as solar panel and battery. The motor drives the intermediate shaft is attached to the platform by a clamp attached to the iron frame by nut and bolt attachment.

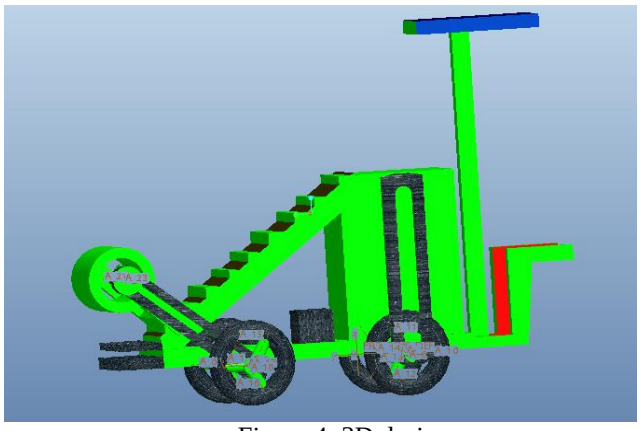

Figure 4: 3D design

ADVANTAGES

1. Light in weight and easy operating.
2. It is use for real time operating system.
3. It is very less operating.
4. It is easy buy.
5. In this system is a non-programmable.
6. Low power consumption.
7. Storage energy is used for crop cutter.

LIMITATION

1. Charging through solar panel will be affected by atmospheric condition.
2. Battery is not most important for duster.

CONCLUSION

By doing all the study it is clear that the crop Cutter and collecting machine is very easy to construct and it's working is also very simple and cheap. This machine is able to run effortlessly thus using this machine efforts of farmers can be reduced. The cost of this machine considerably less as compare to manual grass cutter. The success of this machine depends on how the farmers use this machine.

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