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FABRICATION OF IOT OPERATED CONO WEEDER

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ABSTRACT

In this modern era research in the agricultural field is going on. Day by day the population of India is increasing and to fulfill the need of food, modernization of agricultural sectors is important. Mechanization gives higher productivity in minimum input. Farmers are using same traditional methods. Paddy is one of the major crops grown in India. The problems in paddy cultivation are availability of labors, low productivity rate and more manual efforts required for weeding. For paddy cultivation, more time is required because of fertilizer feeding and weeding processes. For reducing these problems design and fabrication of auto functioned weeder is made as our concept. This machine is designed as per the standard dimensions which suits for the field and then fabrication process is carried. The weeder will remove weeds between two rows. It will remove multiple weeds in less time, so a complex operations completed in a simple and effective manner. Therefore, it reduces the manpower, labour cost and also time.

Keywords: IOT Operated, Cono weeder & agricultural field

1. INTRODUCTION

India is agriculture-based country. Our economy also depends on agricultural products. Nowadays tremendous changes have occurred in conventional methods of agriculture like seed plantation, irrigation system, pesticides and spray used. For developing our Economic condition, it is necessary to increase our agricultural productivity and quality. Majority of the Indian population depends on agriculture and agro-based industries and businesses. In Indian agriculture paddy cultivation is one of the main commercial crop. Rice is one of the chief grains of India. Rice is the basic food crop and being a tropical plant, it flourishes comfortably in hot and humid climate. Rice is mainly grown in rain fed areas that receive heavy annual rainfall. Rice is the staple food of eastern and southern parts of India. Rice can be cultivated by different methods based on the type of region. Rice grows on a variety of soils like silts, loams and gravels. It can also tolerate alkaline as well as acid soils. However, clayey loam is well suited to the raising of this crop. Actually, the clayey soil can be easily converted into mud in which rice seedlings can be transplanted easily. Proper care has to be taken as this crop thrives if the soil remains wet and is under water during its growing years. Rice fields should be level and should have low mud walls for retaining water. In the plain areas, excess rainwater is allowed to inundate the rice fields and flow slowly. Rice raised in the well-watered lowland areas is known as lowland or wet rice. In the hilly areas, slopes are cut into terraces for the cultivation of rice. Thus, the rice grown in the hilly areas is known as dry or upland rice. Interestingly, per hectare yield of upland rice is comparatively less than that of the wet rice.

2. CONSTRUCTION

The base frame which acts as a chassis of vehicle is fabricated with the help of square tubes and channels by metal cutting and metal joining process called welding. The wheels are attached to the chassis for its displacement, in which two at rear side and other two at front side. The rear wheels are connected with separate DC drives; the drive shaft is of DC motor is also linked with front wheels through chain drive arrangement. Through this connection the torque applied on all four wheels are equal, hence the vehicle can easily move on the field. At the lateral sides of chassis, between two wheels a conoweeder arrangement is mounted. The drives are connected to the output pins of controller, while its input pin is connected with WIFI module. The web page with activation keys are created. The source to operate the drives are provided with the help of battery which is mounted on the chassis setup.

3. WORKING PRINCIPLE

Initially the setup is placed on the field where the weeding operation is to be carried, the operator also gets logged to the web page which is responsible for the operation of automatic conoweeder setup. When the operator activates the required key to move the setup, this allows the DC drive to operate and tends to rotate the drive shaft to rotate about its axis. This causes all the four wheels to rotate and thus the setup is allowed to move on the field. This movement makes the conoweeder installed with setup of remove the grass around the paddy crops.

4. MAJOR COMPONENTS

CHAIN DRIVE
D C MOTOR
FRAME
BATTERY
BEARING
SHAFT
DISC
SHEET METAL
WHEEL4
CIRCUIT;
IOT
RELAY

5. METHODOLOGY

Initially, we constructed the frame by using mild steel hollow square pipes. By welding these square hollow pipes we bring a shape for agriculture welder.

By using nuts and clamps Dc motor is mounted at the front end of the frame.

For easy holding purposes, Square pipe is welded at the rear end of the frame, a switch is provided on the handle.

To make this welder comfortable and friendly we constructed and introduced the sliders for easy height and length adjustments based on the height of the operator.

Two wheels are attached to the frame for easy movement in a particular direction.

The battery is mounted between the handle and motor to reduce the burden on the operator, Battery is mounted at the center or in between the handle and motor.

Second class at levels are attached to the motor for easy removing of weed.

A collector in constructed and welded at the bottom of the frame to collect the weeds and waste materials.

To make connection dc motor to IOT module that make purpose of DC motor actuators purpose of weeder

6. OBJECTIVE

a) The main objective of our project is to construct and test the motorized agriculture weeder.

b) Generally, humans and animal power are used to control the weeds but we have developed a mechanical weeder.

c) To limit the time consumption for weeding, we introduced mechanical weeder.

d) To understand the conditions under which the weed competition is high so that we can control the weeds.

e) Providing the linear and vertical height adjusting slider to facilitate the operator to adjust the frame as per his height

To automate the agriculture machinery with help of nowadays technology internet

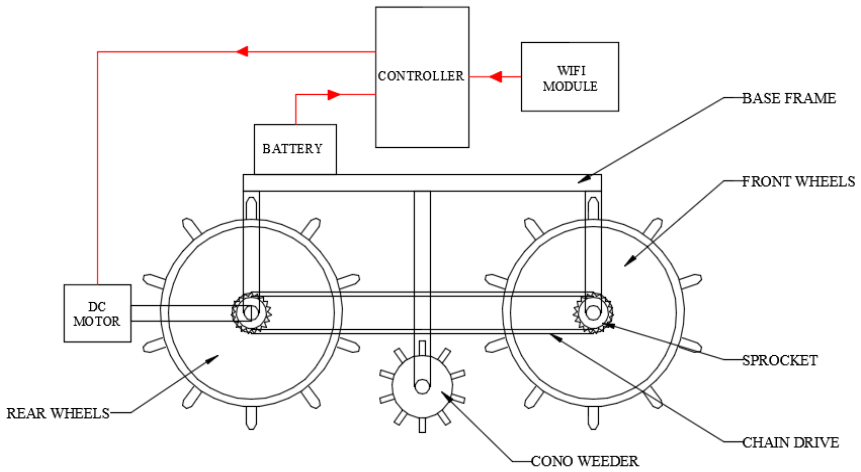
7. MANUFACTURING PROCESS

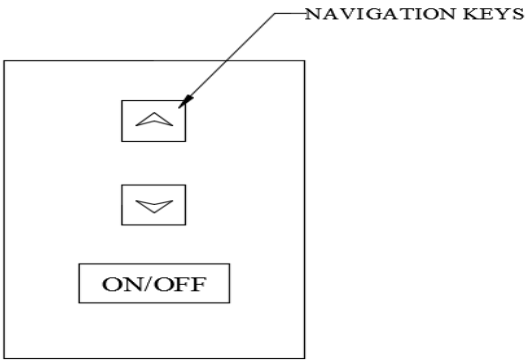
Manufacturing processes are the steps through which raw materials are transformed into a final product. The manufacturing process begins with the creation of the materials from which the design is made. These materials are then modified through manufacturing processes to become the required part. Manufacturing processes can include treating (such as heat treating or coating), machining, or reshaping the material. The manufacturing process also includes tests and checks for quality assurance during or after the manufacturing, and planning the production process prior to manufacturing.

8. MATERIAL USED

S.No	DESCIRPTION	QTY	MATERIAL
1	D C MOTOR	2	ELECTRICAL
2	BATTERY	1	ELECTRICAL
3	BEARING	8	STAINLESS STEEL
4	FRAME, METAL STRIP, SHAFT	AS PER REWUIRMENT	MILD STEEL
5	DISC	1	MILD STEEL
6	SHEET METAL	1	MILD STEEL
7	CHAIN DRIVE	2	STAINLESS STEEL
8	WHEEL	4	RUBBER
9	CIRCUIT;	1	ELECTRICAL
10	RELAY,IOT		

9. 2D LAYOUTS OF MODEL





10. SETUP PHOTOS

11. CONCLUSION

Operating with the Self-propelled cono weeder had a heart rate of 116.89 beats and oxygen consumption rate of 0.649 l/min. The energy expenditure rate was also obtained as 13.54 kJ/min. The field capacity and field efficiency was found to be 0.032 ha/h and 94.49% with weeding efficiency of 68.77%. The minimum man hour required for controlling the weed with self-propelled cono weeder is 25 man-h/ha at the operating speed of 2.28 km/h with fuel consumption of 6.77 l/ha. The developed machine is efficient in operation, but there is little instability as the power source is mounted on one side. This can be avoided if we mounted the power source above the ground wheel.

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