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Android Based Multipurpose Agricultural Vehicle

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Abstract:- The main purpose of this paper is to develop a multipurpose vehicle which can be controlled by android smartphone. The main purpose of this vehicle will be to do all the work a farmer does such as ploughing, sowing, cutting and providing water in the fields to crops. Design of this vehicle is very simple as we have provided seed funnel , crop cutting blades which is height adjustable, spraying water pipe which is attached to an overhead tank and metal yoke which has pointed ends for ploughing. The internal circuit runs on arduino uno microcontroller which is the heart of this system, also motor driver ic and relays are attached with high torque motors.

Keywords:- *multipurpose, design, agriculture, cultivator, ploughing, cultivating, andriod.*

I. INTRODUCTION

Agriculture is the backbone of India. The history starts back from the Indus Valley Civilization Era and is continuing till now. Today India ranks second in farm Input worldwide. Many vehicles or machines has been introduced into the farming or agriculture sector for particular works , provided does a single task but there is no vehicle made which can do all farming works together. So we are making this model as a prototype for big vehicle to be made. By making this vehicle we can implement a lot of difficulties in the agriculture sector. The main parts of this vehicle are Arduino UNO microcontroller, DC Motor of relatively high starting torque, Motor driver IC L293d for controlling motor, Bluetooth device, relay for switching mechanism and for providing additional safety to the circuit. The motor has 10 rpm and is connected to the IC and relays. The system is like a moving robot or vehicle which has four wheels and the cultivator is attached to the back side of the vehicle. The seed sowing system is mounted on the top of the vehicle followed by the water tank for the water supply. These are the features which make farming suitable and easy.

II. SCOPE AND OBJECTIVES

A. Scope of the Project

This project will be an example for future agricultural related works. It will provide clarity of thought to what is to be more done in the smooth functioning of farming, resolving the difficulties and making more easy the work. Its various parts can be utilized for doing many single operations.

B. Objectives of the Project

The main objective of the project is to reduce human effort in the field of agriculture by the use of a small robot or vehicle. Also perform 4 operations at a single time hence increasing production and saving time. This machine is easily operable and understandable.

III. PROPSOED WORK METHODOLOGY

In this segment we have given detailed information of the choice of the material of the vehicle followed by the detailed inspection of the working parts. The main factors for selection of the materials are the mechanical resistant followed by the chemical and thermal resistant. Below down is the 3d figure for the design of frame.

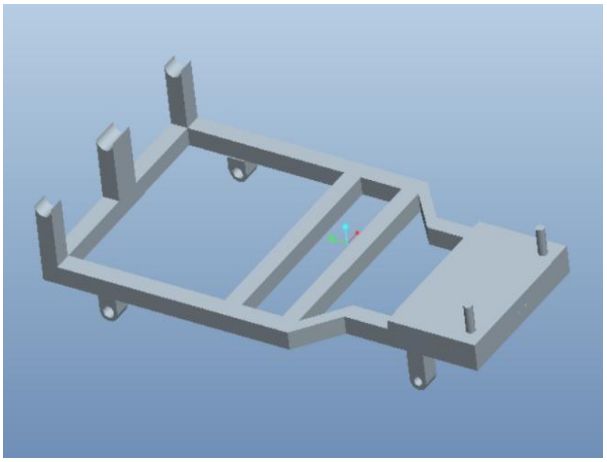

Fig. 1: 3D-Design of Frame

A. Chassis of the Vehicle

The first choice of the material for the building the base of the vehicle is iron , wheels are designed keeping in the manner that it can work on fields which can go through mud roads, broken pavements etc. Also cardboard is used for seed mounting system and is well fitted on the top of area designed for it surrounded by iron structure.

Fig. 2: Chassis of the Vehicle

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B. Working Equipments/Tools

- Wheel is designed for the rough patchy field area accordingly followed by the conventional lengths and diameter of the wheel. The material used in making the wheel is iron.

Fig. 3: Wheel of the Vehicle

- Seed sowing box mounted above the vehicle is designed through hard cardboard and has sprinkle system in it which is operated by circuit system of microcontroller. Very fine holes are made which allow passage to grains to fall into the soil.

Fig. 4: Seed Sprinkle System

- Plough tool is also made of iron which has sharp ends so that it easily can find it roots in the soil and work accordingly. We have also attached a narrow pipe tied to the plough tool which can easily sprinkle water. The overhead tank is mounted on the system of the vehicle.

Fig. 5: Plough Tool

- Crop cutter is attached in front of the vehicle, which is used to cut the crops. It has fine blade which is used to harvest crops of different heights. It is controlled by the system through the circuit.

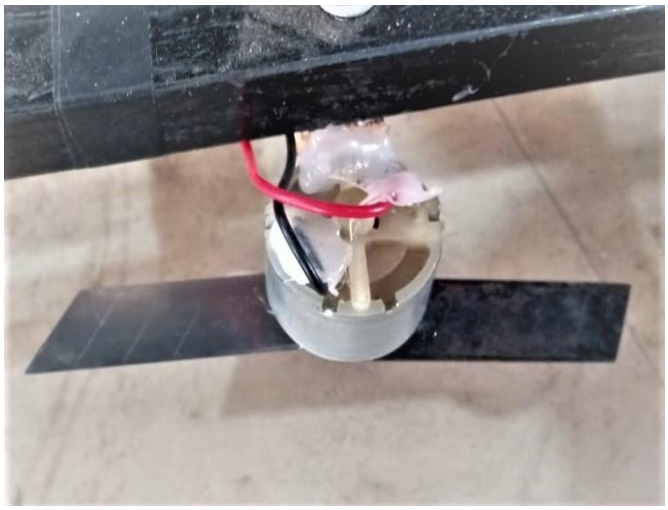

Fig. 6: Crop Cutter

IV. EXPLANATION OF INTERNAL CIRCUIT

The internal circuit is designed using Arduino UNO microcontroller of Atmega family followed by the combination of relay and motor driver . Motor of high torque is also used for the movement of vehicle. It is connected to the motor driver due to which its movement can be controlled forward and backwards. We have used relays like SPDT(single pole double throw) which serves two purposes such as protecting the internal circuit from damage and also to serve as a switching component to on and off the system. We have used Bluetooth model HC-05 to establish the wireless communication between machine and android phone. Arduino UNO will receive the data from the android phone and move the machine backward, forward, left and right. Also control the plough tool, water pump and seed sowing mechanism. The android will operate through an app in it having buttons to control the machine.

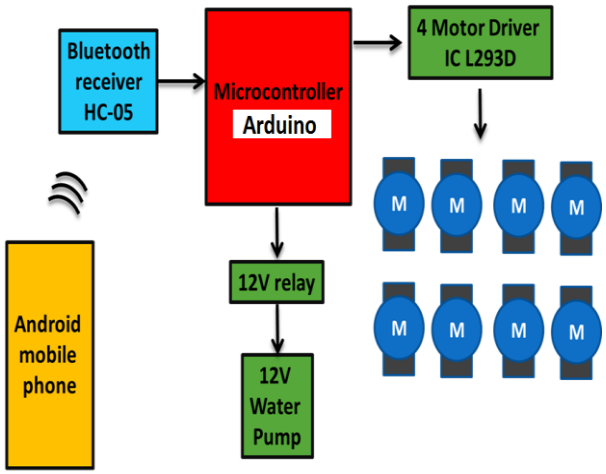

Fig. 7: Block Diagram of the internal circuit

V. CONCLUSION

The project entitled Android Based Multipurpose Agricultural Vehicle is successfully completed and results obtained are satisfactory. It will be easier for people who will undergo future modifications through this project. This is a small prototype of this big model machine yet very handy and easily operable.

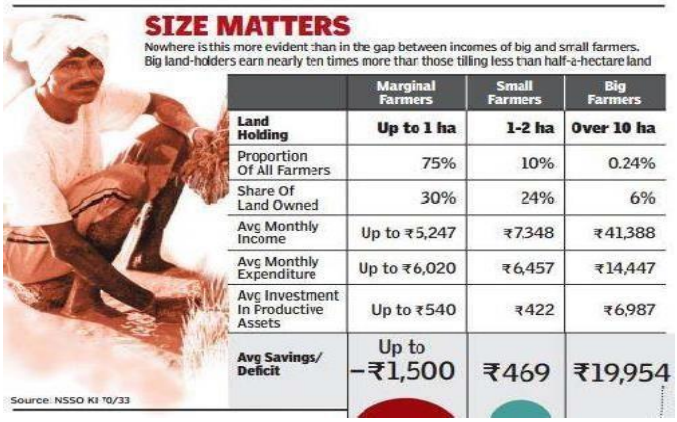

Fig. 8: Chart Representation for size Matters

VI. ACKNOWLEDGMENT

This project would be incomplete without the support of my parents, my brother and Mr. Bhupesh Kumar Pal who was my guide of this project. There relentless efforts in providing me information and guiding me throughout motivated me to be a better leader so that I can complete this project without much difficulties. Also want to thank my project partner Sarvendra who helped me throught in all aspects of the project making and also for sharing the burden of expenses.

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