AGRICULTURAL ROVER BASED ON SOLAR POWER

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***Abstract*: In the field of agriculture various problems are faced by farmers in the operations like seed sowing, pesticide spraying, weeding. It takes a lot of time to perform all these tasks and also need different devices to perform these tasks. Thus "Agricultural Rover Based On SolarPower" is designed to execute the various functions simultaneously. The main aim of this paper is increasing the productivityand reducing the man power involved in Agriculture, the agricultural rover starts its function by ploughing the field, then sows the seeds in the ploughed area, waters the area where the seeds were sown and also cuts the weed. The functioning of the rover can be operated through Bluetooth.**

***Keywords*: Arduino UNO, Solar Panel, Bluetooth Module, Relay Module, Motor Driver Circuit, Battery.**

INTRODUCTION

Our whole economy is based on agriculture. So, it is necessary to make some advancement in this field. Today's agricultural field demands to find new ways of agricultural operation to improve performance efficiency. In the field of agriculture various problems are faced by the farmers in the operations like ploughing, seed sowing, and pesticide spraying, watering, and weeding. Also the equipment used to perform these operations are very heavy.

Nowadays robots are used in various sectors. We can make the use of available technologies and the robotics technology in the farming system to reduce the efforts of farmersand also to reduce time, energy and required cost. Hence, there is a greater need for multiplecropping in the farms and time saving machines. This project helps in different types of seed sowing machines. Watering, ploughing and also cutting the unwanted weed will be done by this project which will be helpful for the agriculture industry to move towards mechanization.

OBJECTIVE

By observing all the above point into considerations, thus agricultural rover machineis designed which can do complete agriculture work automatically without manpower requirement and which is tractor independent. Since the aim of the project is to create an ecofriendly machine. This implements simple mechanism which is operated by the microcontroller. Since there is no requirement of tractor so cost of production is also reduces. Since the machine cannot use any fuel, it cannot cause any pollution thus ecofriendly. This machine can revolutionize the present dayagriculture. Further many more modifications which completely automate the whole agriculture work and the machine simply work like a rover.

LITERATURE REVIEW

The main objective of autonomous agribot is efficient utilization of resources and to reduce labor work. It can perform various tasks like soil testing, sowing of seeds, spraying of fertilizers and harvesting of fruits. It can measure the NPK content of soil using color testing of chemical solution using fiber optic and dispense the required amount of fertilizers which is necessary or less in soil. It can dig a hole in soil by drilling mechanisms and plants seed and cover hole by soil again. It can spray the pesticides using spraying mechanisms. All above operations are performed by usingArduino controller which is master and others are lily pad which are slaves performs specific operation. By using image processing and robotic arm the agribot will detect fruits on treeand cut the fruit and dump it on basket. [1]

Agribot is a robot designed for agricultural purposes. It is designed to minimize the labor of farmers in addition to increasing the speed and accuracy of the work. It performs the elementary functions involved in farming i.e. ploughing the field, sowing of seeds and covering the seeds with soil. It uses controller, LM293D IC is a typical Motor Driver IC which allows the DC motor to drive on any direction, DC motor for digging. The robot is autonomous and provides the facility for optional switching of the ploughing system when required. PSoC (Programmable System on Chip) controller from Cypress Semiconductor, USA is used to control the robot. [2]

Mango cultivation methods being adopted currently are ineffective and low productive despite consuming huge man power. Advancements in robust unmanned aerial vehicles (UAV's), high sp d image processing algorithms and machine vision techniques, reinforce the possibility of transforming agricultural scenario to modernitywithin prevailing time and energy constraints. Present paper introduces Agricultural Aid for Mango cutting (AAM), a Agribot that could be employed for precision mango farming. It is a quadcopter empowered withvision and cutter systems complemented with necessary ancillaries. It could hover

around the trees, detect the ripe mangoes, cut and collect them. Paper also sheds light on the available Agribots that have mostly been limited to the research labs. AAM robot is the first of its kindthat once implemented could pave way to the next generation Agribots capable of increasing the agricultural productivity and justify the existence of intelligent machines.[3]

IMPLEMENTATION

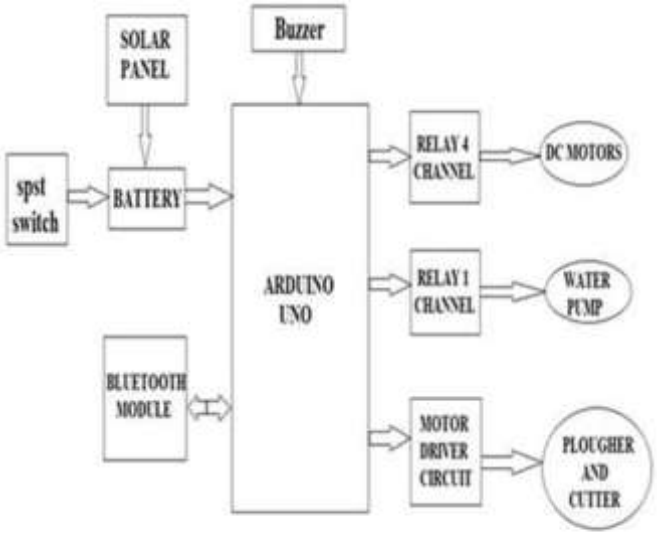

Fig. 2.1: Block Diagram Of Agricultural Rover Based on Solar Power

In this paper we have used solar energy by which the rover works. The Agri rover starts itsfunction by ploughing the field, then sows the seeds in the ploughed area and at last waters the area. It also does the work of cutting the unwanted plants. It is programmed to carry out the above functions simultaneously. The Agri rover is capable of doing multi-tasks and this can be said that it is a reconfigurable robot.

RESULT

Fig. 2: Agricultural Rover Prototype FrontView and Back View

The design of hardware components is doneand processed by Arduino UNO.

Fig. 3: Display of Software Output onMobile Phone

CONCLUSION

In agriculture, the opportunities for rover- enhanced productivity are immense – and the robots/rovers are appearing on farms in variousguises and in increasing numbers. The other problems associated with autonomous farm equipment can probably be overcome with technology. It may mean a rethinking of how crop production is done. Crop production may be done better and cheaper with a swarm of small machines than with a few large ones. One of the advantages of the smaller machines is that they may be more acceptable to the non-farm community. The jobs in agriculture are a drag, dangerous, require intelligence and quick, though highly repetitive decisions hencerovers can be rightly substituted with human operator. Rovers can improve the quality of our lives but there are downsides. The present situation in our country all the agricultural machine is working on manual operation otherwise by petrol engine or tractor is expensive, farmer can't work for long time manually to avoid this problem, we need to have some kind of power source system to operate the digging machine.

FUTURE SCOPE

This project is a small scale effort but the samecan be implemented with enormous results in a large scale that benefits all farmers of the world. Apart from ploughing, seed dispensing, watering the ploughed area and cutting the weed and other farming process like harvesting, irrigation, automated seeding etc.

REFERENCES

1. Ashish Lalwani, Mrunmai Bhide, S. K. Shah, A Review: Autonomous Agribot For Smart Farming 46th IRF International Conference,2015.
2. Akhila Gollakota, M.B.Srinivas, Agribot-A multipurpose agricultural robot, India Conference (INDICON), IEEE, 2011.
3. Cong Ming, in Ligang and Fag Bo Intelligent robot Mowers: A review", Robot, Vol. 29, no 4, 2007, in press.
4. Gulam Amer, S.M.M. Mudassir, M.A. Malik, "Design and operation of Wi-Fi AgribotIntegrated system", International Conference on Industrial Instrumentation and control (ICIC), IEEE, 2015.
5. Sandeep Konam, "Agricultural Aid for Mango cutting (AAM)," Electronics & Communication Engineering, RGUKT, R.K. Valley Kadapa, India, 978-1-4799-3080-7 IEEE 2014.
6. V. Yadav, Rupika; Rathod, Jhalak; Nair, "Big Data Meets Small Sensors in Precision Agriculture," Int. J. Comput. Appl., pp. 1–4, 2015.
7. S. Kumar, and C. S. Sudeep. "Robot for Precision Agriculture". 13th National Conference on Mechanism and Machines, 2007.
8. Xue Jinlin, XU Liming, "Autonomous Agriculture Robot and its row guidance", IEEE, International Conference on Measuring Technology, 2010, published
9. Yan Li, chunlei Xia, Jangmyung Lee, "Vision based pest detection and automatic spray in green house plant", page no 920-925, International Symposium, references.