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Smart Agricultural Mechanization: A Multi-Tasking Machine for Efficient Farm Management

Sanjeev Vannur, Siddhanth Kumar Kamble, Shrirang Patil, Nitin Patil, Mr. Sujit Sali

U.G. Student, Department of Mechanical Engineering, Angadi Institute of Technology & Management Belagavi,
Karnataka, India

U.G. Student, Department of Mechanical Engineering, Angadi Institute of Technology & Management Belagavi,
Karnataka, India

U.G. Student, Department of Mechanical Engineering, Angadi Institute of Technology & Management Belagavi,
Karnataka, India

U.G. Student, Department of Mechanical Engineering, Angadi Institute of Technology & Management Belagavi,
Karnataka, India

Assistant Professor, Department of Mechanical Engineering, Angadi Institute of Technology & Management Belagavi,
Karnataka, India

ABSTRACT: In arrange to meet the nourishment prerequisites of the developing populace and quick industrialization, modernization of agribusiness is unpreventable. Mechanization empowers the preservation of inputs through exactness in metering guaranteeing way better dispersion, lessening amount required for superior reaction and avoidance of misfortunes or wastage of inputs connected. Mechanization decreases unit fetched of generation through higher efficiency and input preservation. Agriculturists are utilizing the same strategies and hardware for the ages. In our nation cultivating is done by conventional way, other than that there is expansive improvement of mechanical and benefit segment as compared to that of farming. The showering is customarily done by work carrying rucksack sort sprayer, which requires exertion that is more human. The weeding is the for the most part done with the offer assistance of bulls which gets to be expensive for ranchers having little cultivating arrive and grass cutting work fetched is moreover costly So to overcome these over two issues a machine is created which will be advantageous to the rancher for the showering and weeding operations

KEYWORDS: Multipurpose Agricultural, Multi application, Rotating pesticide, Solar Powered

I. INTRODUCTION

A creation of a multi-purpose application farming machine is one that employments spinning edges, to cut a cultivate arrive spaces, at an indeed length. Grass cutters utilizing a edge that pivots approximately a vertical pivot are known as rotational cutters, whereas those utilizing a edge get together that turns almost a flat pivot are known as barrel or reel cutters. The showering is customarily done by work carrying rucksack sort sprayer which requires more human exertion. The weeding is the for the most part done with the offer assistance of Bulls which gets to be expensive for agriculturists having little cultivating arrive. Numerous diverse plans have been made, each suited to a specific reason. The littlest sorts, pushed by a human, are reasonable for little private gardens and gardens, whereas bigger, self-contained, ride-on cutters are appropriate for huge gardens, and the biggest, multi-gang cutters pulled behind a tractor, are outlined for huge regions of grass such as golf courses and metropolitan parks

Objectives

- To diminish human exertion in the rural field with the utilize of little machine
- To perform all four operations at single time, thus increments generation and spares time.
- To finish huge sum of work in less time.

- The utilization of sun powered can be utilized for Battery charging. As the Machine works in the field, the beams of the sun can be utilized for sun powered control generation.

The substance of paper is as takes after, Segment II examines the writing study which premise the show concept, Area III centers on the technique of the concept. The working concept is talked about in the Segment IV and Segment V gives the Result of the paper and Segment VI the conclusion

II. LITERATURE SURVEY

To begin with 1st grass cutter was designed by Edwin Budding in 1827 in Stroud, Gloucestershire, and licensed in 1830. It was at first outlined to keep up sports grounds and well off gardens as a way better elective to the grass shearer. Ten a long time afterward, machines worked by creatures risen, and by 1893, steam-powered forms were created by James Sumner. Over the a long time, developments like Thomas Green's chain-driven cutter (1859) and Elwood McGuire's lightweight human-pushed demonstrate (1870) made a difference popularize 8% Plagiarized Content 92% Page 1 of 2 grass cutters. John Burr's moved forward rotary-blade plan came in 1899, and Amariah Slopes established the Archimedean Grass Cutter Co. in 1871. The early 1900s saw the rise of riding cutters and pack cutters. Gasoline-driven cutters got to be common after the turn of the century, with the plan of roller-drive cutters remaining generally unaltered since the 1930s.

III. METHODOLOGY

The agrarian vehicle coordinating different useful units to upgrade cultivating proficiency. The seed sowing unit comprises a seed holder, a shaft with goad gear-like wheels containing scoop structures, and a pipe with channels that direct the seeds into the soil behind the furrow. The pesticide sprayer unit utilizes centrifugal pumps to quicken and shower water or pesticide through spouts on either side of the vehicle. Controlled by switches and fuelled by a 12V, 10-litre capacity water unit, the pumps run at 500 rpm. A solar-powered battery framework powers the whole vehicle. The 12V, 10W sun based board charges the battery straightforwardly, with photovoltaic cells changing over daylight into usable power. Owing to the moo control necessities, a charge controller is not required. The DC engine utilized in the vehicle changes over electrical vitality into mechanical movement based on Fleming's Left-hand Run the show. Known for prevalent speed and torque control, DC engines are perfect for particular mechanical and agrarian applications in spite of the broad accessibility of AC power.

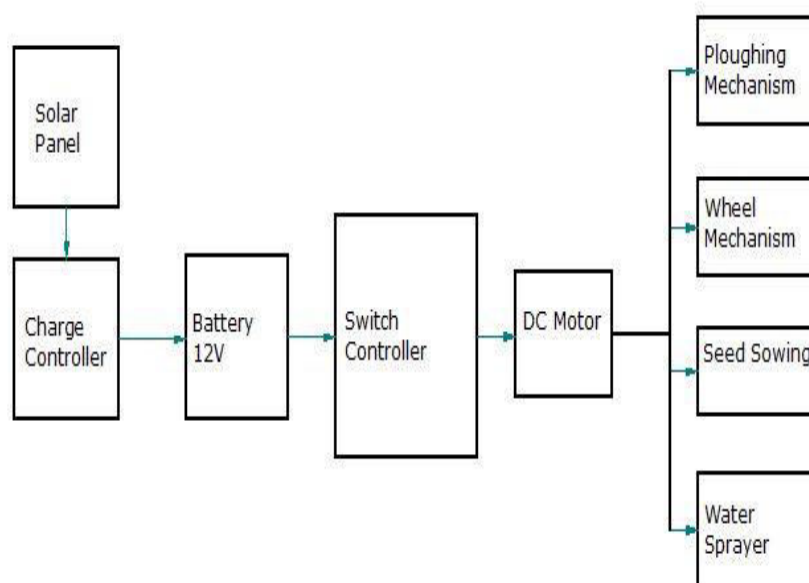


Fig. 1 Block Diagram

IV. WORKING PRINCIPLE

The show works as takes after, the hardware works by physically pushing it forward utilizing handles, which causes the front wheel to pivot. A equip mounted on the wheel hub exchanges movement to a pinion by means of a chain drive. This revolving movement is changed over into responding movement through a single slider wrench component, moving a interfacing bar up and down. This activity drives a single-acting responding pump mounted on best of the pesticide capacity tank—drawing pesticide in on the upward stroke and constraining it out through a conveyance valve and nozzle-equipped pipe on the descending stroke. Moreover, the venture incorporates a solar powered grass cutting machine. It employments an engine associated to a equip course of action and cutting edge. The engine shaft is bolstered by a bearing framework for smooth turn. As the engine runs utilizing sun powered vitality, it turns the shaft, which in turn drives the cutting edge by means of the adapt setup, successfully cutting grass in the field.



Fig. 2 Working Model

V. RESULT

For all intents and purposes our multipurpose agrarian hardware can be utilized for weeding, fertilizing, seed sowing, levelling and moreover utilized for weed expulsion purposes. All the parts are associated in such a way that in each organize of agribusiness the gear can be modified or effortlessly amassed with latches to required length and details of field operation. The working demonstrate of sun based fuelled multipurpose machine effectively worked and the machine can perform their operation such as weeding, seed sowing, and pesticide splashing and levelling the soil effectively. At that point the working demonstrate is performed well and demonstrated their works.

VI. CONCLUSION

The **Multipurpose Agricultural Machine** is a cost-effective, human-powered solution designed for small and medium-scale farmers. It can perform various tasks such as tilling, fertilizing, sowing, leveling, and weed removal. All components are easily reconfigurable using fasteners to suit different field operations. The machine integrates mechanical engineering principles with agricultural needs to boost yield while minimizing labor and expenses. Designed with affordability and ease of use in mind, especially for small farm units, it operates without relying on electricity—making it ideal for rural areas facing frequent power shortages. Trial results confirm that the machine

significantly reduces manpower and time compared to traditional methods. If manufactured at scale, it can offer an economical alternative to expensive equipment, addressing key labor challenges in Indian agriculture and supporting increased productivity for smallholder farmers.

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