

AGRICULTURAL 3 IN 1 MECHANISM

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ABSTRACT

Solar energy is converted into the chemical energy, which is used to drive the different units of the system. In this abstract we have tried to explain how the different agriculture equipments are combined and work together efficiently with reducing the manufacturing cost which will be in affordable budget. The main aim behind this project to construct the equipment which are essential for the farm field with the suitable cost which will be affordable for the poor farmer and also the efficiency of the equipment should be high, so that all farmer can prefer it first rather going to the convectional equipments. The other need is the labour availability, now a day the labour is not being easily available. Also if they are available the working cost of them is very high and the efficiency of the labour is very low. This can cause the working time to be increased. Therefore the work will not be completed in the given time. The trapping of solar energy is very easy and also conversion of it into the electricity is very easy. The equipments required for the conversion of solar energy is easily available in the market with the suitable low cost.

Keyword - Agricultural vehicle, Spraying machine, Dusting machine, Cutting machine.

1. INTRODUCTION

For the proper growth of plants like tomato, cotton, grapes etc. there is need of keeping away this plants from different disease and also the unwanted grass should be removed from the farm field after the specific interval of time. For this lot of effort are required and also the different agriculture equipments which needed lot of money. The agriculture equipment like spraying machine, dusting machine, cutting machine are used to spray the pesticides solid liquid or mist and the cutting machine is used to harvest or used as a grass cutter in the farm field. Also the pesticides are spreads for improving the quality of the crop therefore the pesticides should be sprayed uniformly all over the plant. For spraying the pesticides uniformly the spraying machine and dusting machine is required .We are developing agricultural 3 in 1 mechanical project this project provides farmer 3 needs solution cutting , spraying ,powder spraying.

1.1 Agriculture powder sprayer (Duster mechanism)

We are developing agriculture duster is new mechanical project. It is a common type of duster being used by the farmers. The duster consists of a hopper, fan/blower, rigid/flexible discharge pipe, reduction gearbox, rotating shaft to connect motor, and metering mechanism. The duster has mechanical agitator connected to the gearbox placed in the motor, which chums the chemical and prevent clogging of the outlet. The adjustable orifice plate mounted below the hopper outlet controls the application rate.This is mounted on the frame work with the help of adjustable straps. The discharge pipe fitted with spoon type deflector is directed towards the target

continuously rotating the switch on motor. The chemical in dust/powder form drops from the hopper in the discharge pipe having an air stream created by the blower. These dust particles emerging in, the forms of cloud from the discharge pipe are carried to the plant where these settle on the leaves, stems and other parts.

1.2 Spray system

This small, high volume, 12v fluid circulation pump is very well suited for circulating water through heat exchangers on water intercooled turbo applications. Magnetic drive motor with sealed pump chamber for long life even with continuous use (up to 3lit per minute.). High temperature capable. Pump can also be as replaced damaged condition. it is common type of duster used by farmer we have made certain changes in duster mechanism instead of handle we will couple directly to motor through the shaft duster mechanism consists of

1) **Steel tank** :Capacity of steel tank is 20 litre .

1.3 Cutter system

DC motor shaft connected to sharp blade (grass cutter) .when switched on motor swished that time motor start and cutting work started that time push the overall system .DC motor is permanent magnet type of DC motor. So, no armature and field winding is there as in conventional DC motor. Only single supply is required. The motor speed can be changed if the voltage is changed. But, in our application the motor has to operate at high torque because, it has lifted the material. So, gear box is incorporated with the existing DC motor. This gear box reduces the speed and increases the torque of the motor. Dc motor couple to cutter through shaft when switch is on cutting process start.

2. LITERATURE SURVEY

Er. R. D. Dhete, Nitish Das, Namit Maske, Vinayak Khawas, Dr. S. K. Chaudhary[1]:One type of backpack sprayer is a compressed air sprayer with a harness that allows it to be carried on the operator's back. Another type of backpack sprayer has a hand-operated hydraulic pump that forces liquid pesticide through a hose and one or more nozzles. The pump is usually activated by moving a lever. A mechanical agitator plate may be attached to the pump plunger. Some of these sprayers can generate pressures of 100 pounds per square inch (psi) or more. Capacity of both these types of backpack sprayers is usually 5 gallons or less. Hydraulic sprayers consist of a tank, a pump, a lance (for single nozzles) or boom, and a nozzle (or multiple nozzles). Sprayers convert a pesticide formulation, often containing a mixture of water (or another liquid chemical carrier, such as fertilizer) and chemical, into droplets, which can be large rain-type drops or tiny almost-invisible particles. This conversion is accomplished by forcing the spray mixture through a spray nozzle under pressure. The size of droplets can be altered through the use of different nozzle sizes, or by altering the pressure under which it is forced, or a combination of both. Large droplets have the advantage of being less susceptible to spray drift, but require more water per unit of land covered. Due to static electricity, small droplets are able to maximize contact with a target organism, but very still wind conditions are required. But, in this type of spraying, the labor has to carry all the weight of the pesticides filled tank which causes fatigue to labor and hence reduces the human capacity.

M.V.Achutha, Sharath Chandra. N, Nataraj.G.K [2]:The first concept developed for MAE is the frame is in cubic shape and the attachment like sprayer, flow pipe of fertilizers and sowing were assembled closed cubic, and the inter cultivator placed at the bottom side. The front wheel having snipers which helps in easy flow in wet land, and there are two rear wheel which is supporting to the cubic, cutter can also be adjusted by the handle provide to it, the sprayer is driven by the front wheel drive. The cubic structure is bulky and it's not such easy to operate by the operator and also it's not economical.



Fig -1: Agricultural 3 in 1 Mechanism

2.1 Problem Definition

1. In previously studied ideas there is more safety is required . Backpack sprayer reduces human efficiency .
2. System is bulky and it contains only one spraying mechanism it is manually operated .
3. Second system contain spraying and cutter mechanism but powder sprayer not present in that that system
4. So to eliminate this drawback we are adding some features .

2.2 Control unit

1. Liquid Motor On/Off Button
2. Liquid Clockwise Button
3. Liquid Anticlockwise Button
4. Duster Motor On /Off Button
5. Cutter Motor On / Off Button

3. METHODOLOGY



Chart -1: Methodology

3.1 ADVANTAGES

- ✓ Pollution free.
- ✓ Cost effective.

- ✓ Easy in operation.
- ✓ Multiple operations can be performed at a time.
- ✓ Portable.
- ✓ Less maintenance cost.
- ✓ High efficiency.
- ✓ Construction is easy.
- ✓ No need of skilled operator.
- ✓ Smooth working.
- ✓ Controlling of operation easy.

4. CONCLUSIONS

In this way we conclude that, the different operation can be performed at a time without polluting the environment and by using the non convectonal power source with high efficiency.

5. ACKNOWLEDGEMENT

I express my sincere gratitude to my guide **Prof. V. M. Bachhav** for his technical support which made this Project stage I – II possible. His constant encouragement, suggestions and ideas have been in valuable to this work. I immensely appreciate the time he devoted reviewing my writing and vastly improving my technical writing skills. His thoroughness, discipline and work ethic are laudable and worthy of emulation. I am grateful to them for providing their valuable time without that this dissertation is not possible.


I would also like to thank **Prof. P. G. Vispute, Principal** for reviewing my work. I am also grateful to **Prof. S. D. Ratnakar, Head Department of Mechanical Engineering** for constant support and for providing me with all possible facilities in the college. I would also like to thank the entire Faculty Members of Mechanical Engineering Department for all their valuable assistance in the Project Work.




I shall always be indebted to my family for their unconditional love, support and trust on my judgments during good and bad times. The dedication by my parents to provide the best of educational opportunities to me. They imbibed in us the importance of education, hard work and perseverance in attaining one's goals.

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