

Multi-Purpose Agriculture Machine

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ABSTRACT

The paper aims on the design, development and the fabrication of the vehicle which can dig the soil, sow the seeds, leveler to close the soil and pump to spray water, these whole systems of the vehicle works with the battery and solar power, the vehicle is controlled by toggle switch. In recent years the development of the autonomous vehicles in the agriculture has experienced increased interest. The advantages of these vehicles are hands-free and fast input operations. In the field of agricultural autonomous vehicle, a concept is been developed to investigate if multiple small autonomous machine could be more efficient than traditional large tractors and human forces. Keeping the above ideology in mind, a unit with the following feature is designed, Ploughing is one of the first steps in farming. During this process we till the land and make it ready for the seed sowing. By tilling we mean that a plough will be used which will have teeth's like structure at the end and will be able to turn the top layer of soil down and vice-versa. Seed sowing comes next where the seeds need to be put in ground at regular intervals and these needs to be controlled automatically. Limiting the flow of seeds from the seeds chamber is typically doing this. soil leveler is fitted to close the seeds to the soil and to level the ground. Water pump is used to spray the water.

Keywords-- Sprayer, Toggle switch, Battery, Solar panel

I. INTRODUCTION

India is an agriculture based country in which, 70% of people depends on the outcome of farming. But if we observe that with increase in population the farm gets distributed among the family and because of this, farmer in India held averagely only two acre farm. Also economically, farmers are very poor due to which they are unable to purchase tractors and other costly equipments hence they use traditional method of farming. Basically, many farmers in India also use bullocks, horses and he-buffalo for farming operation. This will not satisfy need of

energy requirement of the farming as compared to other countries in the world.

So We are thinking that human and animal efforts can be replaced by some advance mechanization which will be suitable for small scale farmer from economical and effort point of view. So we are developing this equipment which will satisfy all this need and to solve labour problem.

In this equipment We used 24cc engine for digging operation. And for spraying used motor with 12V battery. Next two operations are manual base which is cultivation and sowing . This machine perform four farming operation (digging, sowing, cultivation, spraying) which is used small scale farming .By using above attachments one may perform various farming operations in less time and economically.

II. SCOPE OF THE PROJECT

Multifunctional agricultural vehicle mainly focuses on the basic problems faced by fellow farmers. i.e. Seed Sowing, fertilizers spraying ,cultivation and digging. We are looking this project as revolution in small farms in India, which is most uncovered area in this sector is cost and more efficient way.

III. COMPONENTS INVOLVED

Multipurpose farming machine consist of following components:

- 1) Chassis frame
- 2) Engine 24 cc
- 3) Sprayer
- 4) Auger bit drill tool
- 5) Hopper
- 6) Fertilizer tank
- 7) 12 V Motor
- 8) 12V Battery
- 9) Switch
- 10) Accelerator
- 11) Lever
- 12) Cultivating tool
- 13) Hub wheel
- 14) Shank
- 15) Handle

IV. CONCEPT DEVELOPMENT

A. Introduction

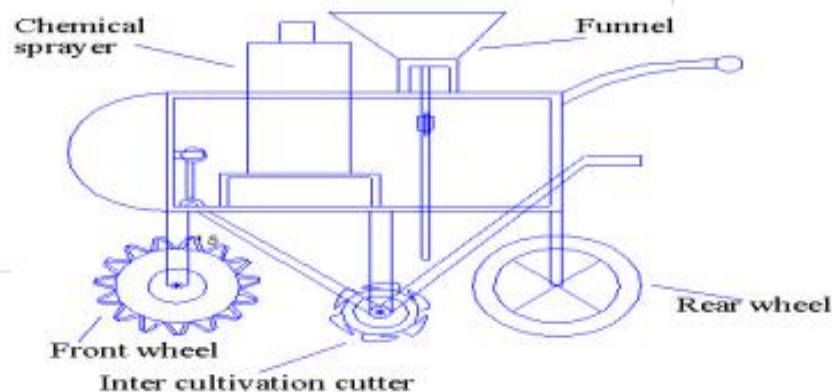
The different kinds of problems faced in traditional method of using individual equipments for agriculture field are mentioned below. We are using three concepts and are developed for multipurpose agriculture equipment and the best concept is selected using bi cycle.

B. Need Analysis

1. Gathering raw data from the customers.
2. Interpreting the raw data in terms of customer needs.
3. Organizing the needs into primary, secondary and tertiary needs.

4. Establishing relative importance of needs.

The concept developed for MAE is shown in the below fig 1, 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.



V. WORKING OF MACHINE

This machine basically works on Bluetooth system. It has three components installed in it cutter, cultivator, hopper. We just need to sit aside and operate the machine with mobile phone by connecting it with

Bluetooth system. This machine will reduce the time and can execute the operations at once. Thus we can counteract the increasing demand .

It is very helpful for the farmers. They can use it in the way they need and the most important thing is that it works on solar energy so there is no tension of fuel. In future cost of solar panels is also going to be cut at an

affordable price so it is going to cost efficient too.

Significantly reduce and we hope this will satisfy the partial thrust of Indian agriculture.

So in this way we solve the labour problem that is the need of today's farming in India

Specification of component

Dimensions

- Height - 36 inches
- Width - 16 inches
- Length - 24 inches
- Wheels - 12 inches
- Water tank - 12 inch width x 6 inch length x 18 inch height
- Handle - 15 inches

Material used

- Chassis - MS pipe - 2 x 1 inch - 14 gauge
- Handle - 1 inch round pipe MS - 14 gauge

VI. CONCLUSION

After the manufacturing and trial on the “Multipurpose Agricultural Automobile (Farm Machine)” conclusion which we made are as follows:

1. Based on the overall performance of the machine we can definitely say that the project will satisfy the need of small scale farmer, because they are not able to purchase costly agricultural equipment.
2. The machine required less man power and less time compared to traditional methods, so if we manufacture it on a large scale its cost gets
 - We can interface sensors to this Machine so that it can monitor some parameters.
 - We can add Wireless Technology to Control Machine.
 - We Can add More Drill for different crops.
 - We can add water tank + fertilizer tank in Machine to reduce more efforts.

- There are to be proper provisions are needed to couple the machine with the tractor.
- We can add solar panel for spraying system .

REFERENCES

- [1] Permin, O., L. N. Jorgensen, & K. Persson. (1992). Deposition characteristics and biological effectiveness of fungicides applied to winter wheat and the hazards of drift when using different types of hydraulic nozzles. *Crop Protection*, 11(6), 541-546.
- [2] Zhao, S., G. S. P. Castle, & K. Adamiak. (2008). Factors affecting deposition in electrostatic pesticide spraying. *Journal of Electrostatics*, 66(11-12), 594-601.
- [3] Sidahmed, M. M., H. H. Awadalla, & M. A. Haidar. (2004). Symmetrical multi-foil shields for reducing spray drift. *Biosystems Engineering*, 88(3), 305-312.