

Multi Operational Agriculture Vehicle

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Abstract

Multi operational agriculture wagon operated by SI engine as name suggest is a multipurpose wagon operated by SI engine for agricultural application. Its main function is to spray pesticides over the crops as to save them from pests. Moreover it is a multi-functional machine which can also carry out the function of cutting grass and cleaning the land. Human have successfully developed special equipment's such as using Gtractor operated sprayers but are costly. Hand operated sprayers are available in market but it is tiresome to work with it. So when we are in need to spray pesticide over a whole agriculture land this particular wagon will be perfect and along with it will also cut unwanted grass between the crop. The cost of this agricultural wagon will be feasible for all class of people and moreover the design would be user friendly and convenient in its application. This project has undergone many changes before making its working model to achieve its objective and consumer needs. Multipurpose agriculture wagon can be one of the most useful agriculture equipment. It helps in reducing cost of multiple operations to notable level. Its life span is also very high. The most notable point about this multipurpose agriculture is it doesn't use any external source of power other than power of SI Engine to carry out operations. Both the instruments for operations run with help of mechanical energy of SI Engine only. This wagon can be useful to travel one place to another as it can also work as simple locomotive. It can be parked in small area due to its compact size.

Keywords: I.C. Engine, Sprayer, Grass Cutter, Steering

I. INTRODUCTION

The main purpose of this project is to reduce to tiresome human effort to spray pesticide in the farming land. This project also fulfil purpose to cut unwanted grass between two row of crops. This project contains the need of designing and fabrication of agriculture wagon which can operate both these operation simultaneously. There are battery operated pesticide spraying pump available in market but its life span is very less. The operation of grass cutting is still done manually by farm workers. This project is develops with concept to work efficiently in less time and less effort. This multipurpose agriculture will surely help user. This project has undergone many changes before making its working model to achieve its objective and consumer needs. Multipurpose agriculture wagon can be one of the most useful agriculture equipment. It helps in reducing cost of multiple operations to notable level. Its life span is also very high. The most notable point about this multipurpose agriculture is it doesn't use any external source of power other than power of SI Engine to carry out operations. Both the instruments for operations run with help of mechanical energy of SI Engine only. This wagon can be useful to travel one place to another as it can also work as simple locomotive. It can be parked in small area due to its compact size.

II. LITERATURE

The points which we have taken up from the literature are and gone through are listed below.

Sprinklers are used majorly as a gardening equipment to sprinkle pesticides. Literature gives the clear evidence that development in the sprinkler has been done through these years but the purpose remains the same. Scope of the sprinkler application starts from agriculture application and grass lands. Majorly right now we are having bag back type of sprinkler which is painful to carry. Small spark ignition two-stroke engines have received much less investments in their development compare to four stroke engines. The two stroke engine was very common around 20th century in small displacement applications such as chain saws, outboard motors, lawn mowers, motorcycles, snowmobiles and snow blowers. Two stroke engines are still commonly used for portable, small and specialized engine applications such as, motorcycles, outboard motors, scooters, lawnmowers and dirt bikes, but their popularity has been largely reduced.

III. CONSTRUCTION DETAIL

A. Tools & Material Required

- Tool box
- Grinding machine
- Chains
- Jack

- engine
- silencer
- bearings
- hub
- shafts
- steering
- petrol tank

B. List of Component

The given below is the list of the components of the multi operational agriculture wagon operated by SI engine:-

- Two stroke engine
- pump
- cutter
- Pipe
- Tire
- Steering
- Hub
- Shaft
- Chain

C. Engine Component

There are two main types of internal combustion (IC) engines: the spark ignition (SI), also called the petrol engine, and compression ignition (CI), also called the diesel engine. Most of the components of both the engines are the same, but their fuel burning process differs. In SI engines the burning of fuel occurs by the spark generated by the spark plug while in CI engines the burning of fuel occurs by its compression to high pressures.

D. The Components of Pump

- 1) A tank
- 2) A pump
- 3) A lance (for single nozzle)
- 4) Broom (for multiple nozzles)
- 5) Handle

E. The Component of Cutter

- 1) Cutter blades
- 2) Gears
- 3) Roller
- 4) Bearing
- 5) Wheels

IV. WORKING PRINCIPLE

The working of this agriculture wagon is very simple and for operating this wagon there is no need of skilled operator. Its workings forces by starting SI engine with the help of kick provided. Now change the gear position from neutral and slowly increase the speed with the help of acceleration paddle. The pump will start spraying pesticides with the help of crank mechanism. The grass cutter will start cutting the grass as wagon moves ahead. When these are need to decrease speed apply brake .when we need to stop the engine switch it off. One of the most common forms of pesticide application, especially in conventional agriculture, is the use of mechanical sprayers. Hydraulic sprayers consist of a tank, a pump, a lance or boom, and a nozzle. Sprayers convert a pesticide formulation. Often containing a mixture of water and chemical, into droplets which can be large rain-type drops or tiny almost-invisible particles. This conversion is accomplished by forcing the 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.



Fig. 1: Sprayer (Pump) Components

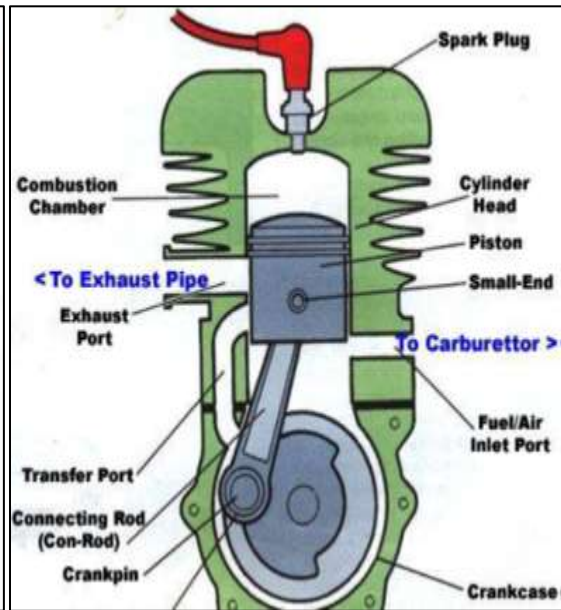


Fig. 2: Basic Components Of Engine

V. SPECIFICATION

Table – 1

Engine	Suzuki max 100
Height of the wagon	3.5 feet
Weight of the wagon	120 kg
Width of the wagon	2.5 feet
Length of the wagon	4.05 feet
Pump	Hand operated (16 liter)
Square hollow pipe	20 x 20 mm
Wheels	Diameter 380 mm

VI. RESULT TABLE:

Table – 2

Sr no.	No of work factor	Average/litter	Efficiency
1	Tractor with loading	20 KM	54.22%
2	Tractor with plaw	22 KM	56.45%
3	Tractor with cultivator	24 KM	58.63%
4	Tractor with spray pump	25 KM	60.55%
5	Tractor without loading	26 KM	62.01%

VII. CONCLUSION

The main problem of definition is about tiresome human effort to spray pesticides as they have to carry them on their shoulder and remove un useful grass between crops which is time consuming and also relatively low costly, so we have proposed or solution in the form of agriculture wagon which can carry both the process of pesticides and chemical spraying as well as to cut the grass. Moreover it is a perfect vehicle to travel of the person as it runs on a fuel efficient S.I. engine and yet it is powerful to provide enough torque.

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