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## MULTI-FUNCTION AGRICULTURE VEHICLE

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### Abstract

Traditional seeding operations and fertiliser sprays, which are frequently used in the farming process, require more time and labor. The seed feed rate is higher, but the time required for the total operation is longer, and the total cost is increased due to labour and the hiring of equipment. The traditional seed sowing mechanism is less efficient and takes longer. The modern age is marked by rapid growth in a variety of industries, including agriculture. Farmers must apply new procedures that do not damage soil texture while increasing total crop productivity to fulfil future food demands. Traditional seeding operations, which are commonly employed in farming, involve more time and effort. The seed feed rate is higher, but the time required for the total operation is also longer, and the total cost is increased due to labour and the hiring of equipment. The work and total cost of sowing seeds and fertilizers are reduced using this machine. Sowing machines should be suitable for all farms, all types of crop, robust construction, and also be reliable. This is the basic requirement of sowing machines. As a result, we developed a manual sowing machine that reduces farmers' efforts while increasing planting efficiency and removing difficulties connected with hand planting. We can plant a variety of plants with this machine

### I. INTRODUCTION

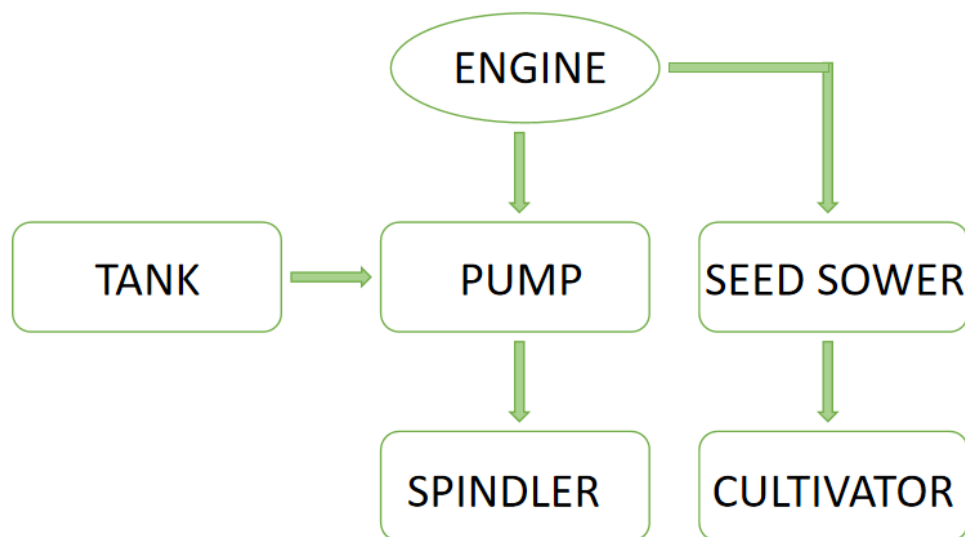
II. Agriculture is the principle source of income for rural Indians, and both men and women work in it. Agriculture has long been and will continue to be the foundation of the Indian economy. From With 4.3 % of the world's water resources and 2.3 % of the world's geographical area, it should be able to support around 17% of the world's people. A sowing operation's main goal is to plant seed and fertilizer in rows at the right depth and spacing, cover the seeds with soil, then compact the soil over the seeds. A typical seed-sowing approach has a number of drawbacks. Different forms of seed sowing and fertilizer placement methods in the soil, as well as the development of a multifunctional seed sowing tractor that can execute multiple tasks one at a time. It is critical to establish a strategy that not only saves time but also saves the farmer's effort in order to save his valuable time and effort. Farmers face the problem of non-availability of bullocks during the peak period of sowing. As a result, they're compelled to spend them additional. Using an automatic seed planter can greatly decrease yield loss. The yield loss can be significantly reduced by using an automatic seed planter. The most important advantage of a multifunction agriculture vehicle is that it can be easily driven by a single person as well as driven semi-automatically and can do the pesticide process as well as other multi-functions at a low cost of the vehicle.

### II.EXISTING SYSTEM

#### 3.1 INTRODUCTION

Tractors are now being used by farmers for very little purpose. So the farmer spends maximum cost on the forming operations and uses the individual components for the process. So we designed a plan to reduce the time and cost of tractors by giving the multi-functions to the mini-tractors. In this project we can cultivate, level, seed sow, and spray the medicine or fertiliser with added components. It will work at the same time, and we can control the operations individually.

## 3.2 BLOCK DIAGRAM



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Fig.3.1 Block diagram of Multi-function Agriculture Vehicle

As Shown in fig 3.1 The Engine power divided by PTO drive. Once transfer the power to pump for take the fertilizer from tank to sprinkler. And another output of power connected with pulley of seed sower by belt for seed sowing process. The seed falls by the hoses. The hoses are clamped beside the cultivator.

### 3.3 Drawback of Multi-function Vehicle

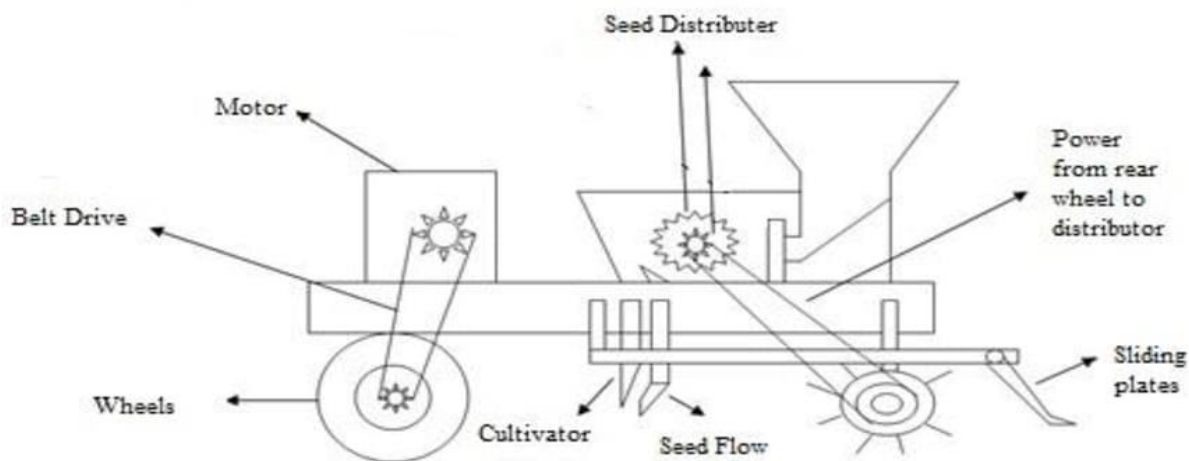
- Need the experienced driver for control
- Weight will increase by adding components

### PROPOSED SYSTEM

#### 4.1 INTRODUCTION

The proposed system is done on fabrication with metal sheet and with metal components by joining it with help of welding and the frame is created as per the required dimensions by cutting the 1mm thickness metal sheet. The cultivator is made up of tubed mild steel. And cuts the box type metal tube then joint then joint by the arc welding. And we designed the seed sower by weld the sheet metal and joined by arc welding. Also cut the sides circularly for insets the gear shaft. It is used for the throw the seed from box to hoses holes. Its rotates by the wheel. The rotating wheel connects at the cultivator's corner. For the cultivator cultivates the land, wheel will rotate and the rotation is transfer to the gear shaft by belt. The wheel bearing is attached for free play. The pump is placed at the centre of cultivator for balance the weight. It is used for pump the fertilizer to sprinkler it runs by the engine power. The fertilizer filled in storage tank. It capable for 30 litres. Finally all the parts are assembled with the Mini- tractor.

4.2 BLOCK DIAGRAM



4.3 Cultivator

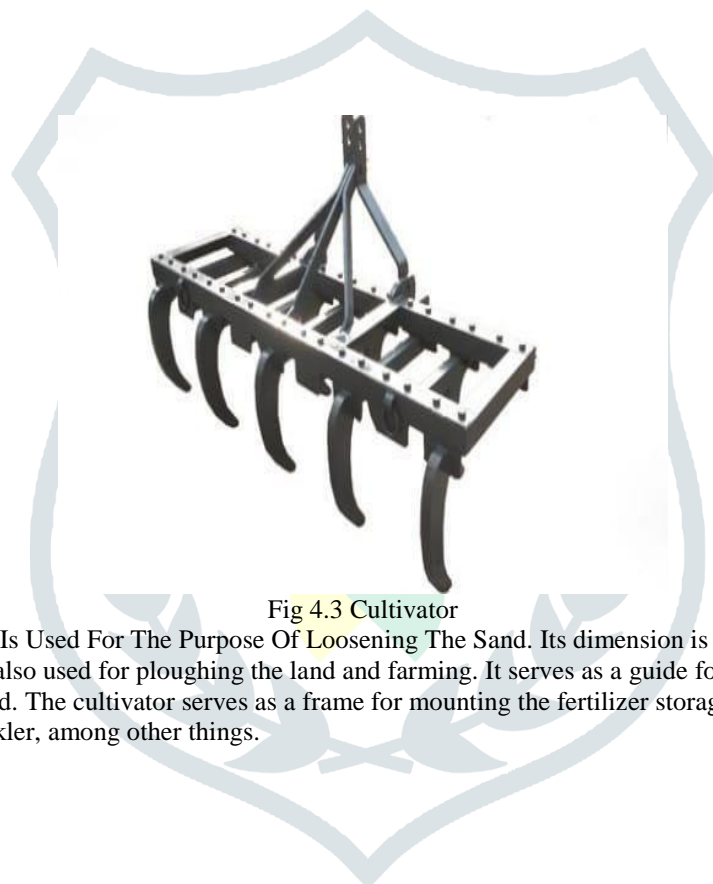


Fig 4.3 Cultivator

A Cultivator Is Used For The Purpose Of Loosening The Sand. Its dimension is 120mm length x 30 mm Breadth x 91 mm height. It is also used for ploughing the land and farming. It serves as a guide for watering the farm's plants. It is also used for leveling the land. The cultivator serves as a frame for mounting the fertilizer storage tank, the HTP pump, the seed sower, the hoses, and the sprinkler, among other things.

4.4 Sprayer



Fig 4.4 sprayer

The suction hose is 3 meters in length and has a strainer at the end to prevent dust particles from impeding the water flow in the HTP pump suction hoses. It uses the source from tractor PTO drive. The source from the tractor has the two different rpms 340 rpm and 560 rpm. The rpm is differed use of pulley through the belt drive. The rpm is also differed from the PTO itself. The sprayer can also be handled with the assistance of power. The HTP pressure pump is also modified using the pressure release valve. The pressure relief valve is also utilized to maintain the support's pressure. With the help of the HTP pump it is used for watering the plants also. We employed a versatile high-pressure pump that may also be used for water washing. The sprinkler is utilized at the end of the hose. The sprinkler speed differed according to the pressure from the HTP Pump. According to the usage of the sprayer and the number of sprayer required and directions needed to be sprayed the sprinkler is used. At 340 revolutions per minute, the HTP pump can pressurise more than 50 metres of pipe. And its ability is also increased by changing

the rpm of 560 rpm. The 3 metre long suction hose features a strainer at the end to prevent dust particles from obstructing the water flow in the HTP pump suction hoses.

#### 4.5 STORAGE TANK

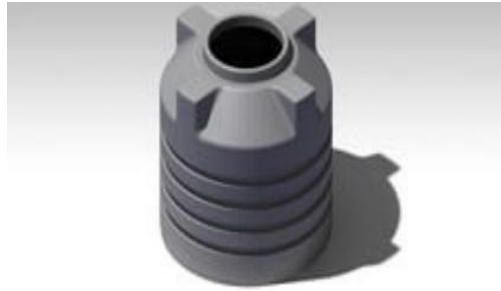


Fig 4.5 storage tank

It is capable for 30 litres. Used for store the fertilizer or water. The fertilizer let out by the way of hoses by the suction of pump. It is made up of hard plastic.

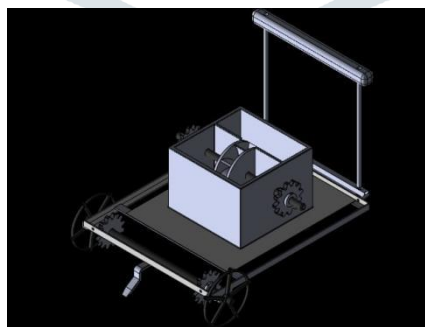
#### 4.6 Pump



Fig 4.6 solenoid valve

The pressure pump is used for increase the pressure of fertilizer and transfer from tank to sprinkler or sprayer by the help of hoses and it rotate by the engine power of the vehicle. Its maximum discharge flow is 10-50 bar.

#### 4.7 Seed sower



Fid 4.7 Seed sower

Seed sower is made up of the sheet metal with the 50x30x50 cm dimension. It is placed at the top of cultivator. Also used for store the seed. A gear assembly placed into the box storage for throw the seed to the holes. The 1 inch diameter tubes are placed at the bottom of the holes. Its connected by the washer. The shaft is rotate by the rotating wheel by the connection of belt. The rotating gear shaft is made up of mild steel.

**RESULTS AND DISCUSSION****5.1 INTRODUCTION**

Fig.5.1 Multi-Function Agriculture Vehicle's Assembly

Its the final result of the multi function agriculture vehicle . we made the assembly to connect at the back of the mini tracktor for the forming process . we fit the pump at the centre of the cultivator to maintain the centre of gravity .This is suitable for the mid level people also reduce the cost compared to the tractor.Its drawbacks are adding the components so its wait will be increases.

**CONCLUSION & FUTURE DEVELOPMENT****6.1 CONCLUSION**

The storage is replaced for reduce the weight so we changee the tank size .After this change we weight is reduced by 10 % So the performance can be increased. Finally we execute the plan successfully and It will useful for the formers and mid range people for forming . In future we will add some features by using AI.

**6.2 FUTURE DEVELOPMENT**

Artificial intelligence will be used to automatically measure the climate and calculate the forming time. Also, calculate in advance what we will do in the season and which types of seeds can be sown. It's all shown by the digital display for easy access and understanding.

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