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TECHNOLOGY****MULTI NOZZLE AGRICULTURAL SPRAYER****Albert Francis A, Durai R, Edison Kanickai Raj D, Gwalbert Maurice G**\* UG Students, Department of Mechanical Engineering, K.Ramakrishnan College of Engineering,  
Tiruchirappalli, Tamilnadu, India-621112

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**ABSTRACT**

The effective design of spraying machine is to reduce the human effort of spraying location and minimize the time taken by the farmer. The vertical adjustment is provided for varying the distance between the nozzle and the plants. The horizontal adjustment is provided to increase and decrease the number of nozzles. The horizontal adjustment is also used for adjusting the nozzle and intermediate distance. In the line of plants, it can be varied for small distance only. The effective wheel distance can be applicable for very short distance as well as long distance. The diesel engine is provided to give the power supply in air compressor and the wheel shaft. The compressor is used to increase the air pressure through the nozzle. A stand is provided at bottom of handle for rest position. The intake and discharge holes are provided at top and bottom of the tank.

**KEYWORDS:** agriculture, sprayer, vertical adjustment, horizontal adjustment, compressor, diesel engine.**INTRODUCTION**

Agriculture is the backbone of our nation. So the economical level of our nation is maintained by the production level of an agricultural products. It will be maintained that there are various types of hybrid seeds and high powered fertilizers are used in that field. The modern agricultural has the advanced cultivation equipment that play a vital role in improving the productivity. In ancient days of the agricultural field there is no special form of machines. But now a days there are many innovators are introduced in the cultivated machines. The machines reduces the effort of the human being. The devices are working under the given power. The power is obtained from both finite and infinite resources. The finite resources are capable to give high power at all the times. But the finite resources are about to extinct on upcoming days. The infinite resources cannot produce constant power from all the times. The finite resources are mostly utilized in the cultivating machines. The sprayers are mostly working in the source of solar, battery and fuel powered.

**EXISTING MACHINES**

The fertilizers are spreaded by various types of sprayers. The sprayers are working at the different power supply and different tank capacity. In ancient days knapsack sprayers are used in spraying technique. The demerits of the backpack sprayer is more man power is required for spraying fertilizer. The sprayers takes more time for spraying fertilizers and hand pain will occur to the former. The fuel powered sprayers takes more input source and the output also maximum. The spraying of liquid fertilizer can be sprayed for a short distance only by using fuel powered sprayers. The tank capacity is minimum when compared to backpack sprayers.



*Fig 2.1 knapsack sprayer*

*Fig 2.2 fuel operated sprayer*

The solar through battery charged sprayers cant give constant power for all the times.It will be working for a certain time only.The remaining time is required for charging the battery.The solar powered sprayers does not produce sufficient power at all the times.But it is the one of the independent renewable resources in the world.The climatic conditions are also affect the power production in top of the sprayer.

The vehicle or truck mounted sprayers are very helpful to spray the liquid fertilizer for a short time.The spray can be done on by applying external source of truck.The wheel diameter is maximum,and the wheel thickness is also maximum.The maximum thickness of all wheel will affect the seed and plants.It also affects the productivity.



*Fig 2.3 solar powered sprayer*



*Fig 2.4 truck mounted sprayer*

## WORKING

The design of our sprayer consists of the major components such as diesel engine,air compressor,stand,nozzle,drive chain and fertilizer stored tank.The diesel engine is used to give the power in both air compressor and the wheel shaft.There is no manpower is required for move the machine.The direction is only controlled by the manpower.The design of wheel diameter is maximum and the thickness of the wheel is minimum.The wheel thickness does not affect the plants and the flowers.The total design of the backside stand is provided for stopping the machine in rest position.Initially the tank is filled with the liquid fertilizer with the correct composition of the water and fertilizer.The air compressor is working with respect to given power from the diesel engine.The diesel engine is used to compress the air at maximum pressure to passed through the tube and the velocity is increased at the outcome of the nozzle.The engine output is directly connected to wheel shaft.The gear ratio is provided for rotate the wheel and the engine power.The bottom hole tube is provided for delivering the fertilizer to the plants.The intermediate connection is provided for air and the fluid is mixed with the given tube.The compressed air increases the velocity of the fertilizer at the end of the nozzle.

This type of sprayer can be applicable for all the type of linearly placed plants.The smaller wheel thickness is very useful to rotate the wheels in between the plants.The existing sprayers are not concerned the number of plants.The design of distance in between wheels are also adjustable depending upon our requirement.If number of plants are minimum then the wheel distance can be compressed and the nozzles are also minimized.In the design capable to increase the intermediate actual distance can be adjustable for third time of its initial distance.So the number of nozzles also increased .So the spraying time is reduced and uniform productivity is possible.

The vertical distance also adjustable for depending upon our requirements.The tank top hole is provided for fill the liquid fertilizer in the tank.The tank capacity is maximum when compared to existing sprayers.

## DESIGN

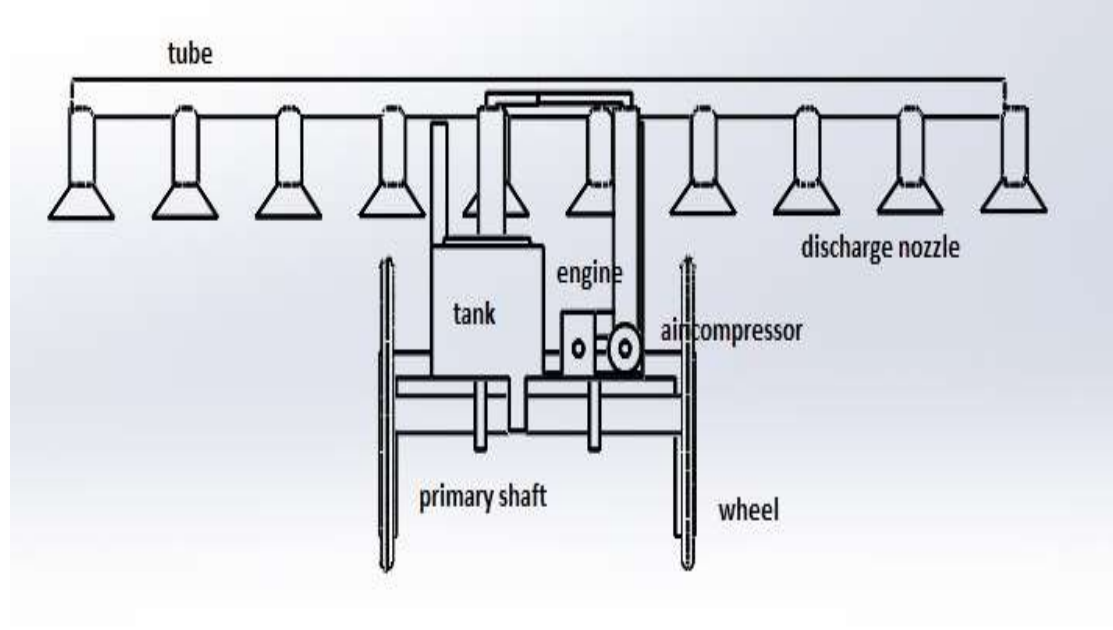


Fig 4.1 front view of the machine

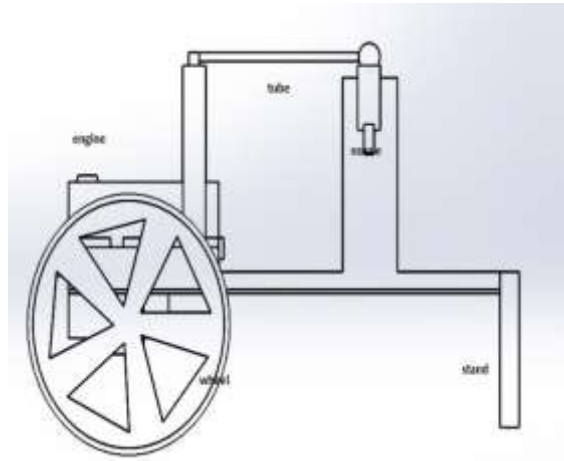


Fig 4.2 side view

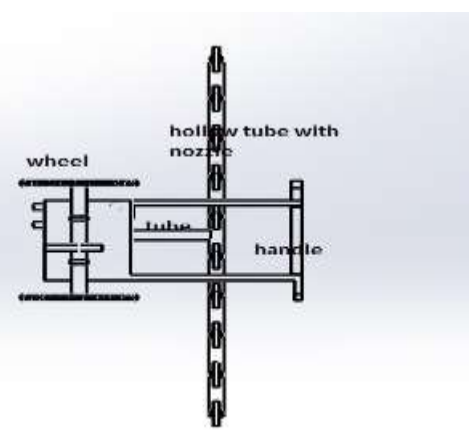
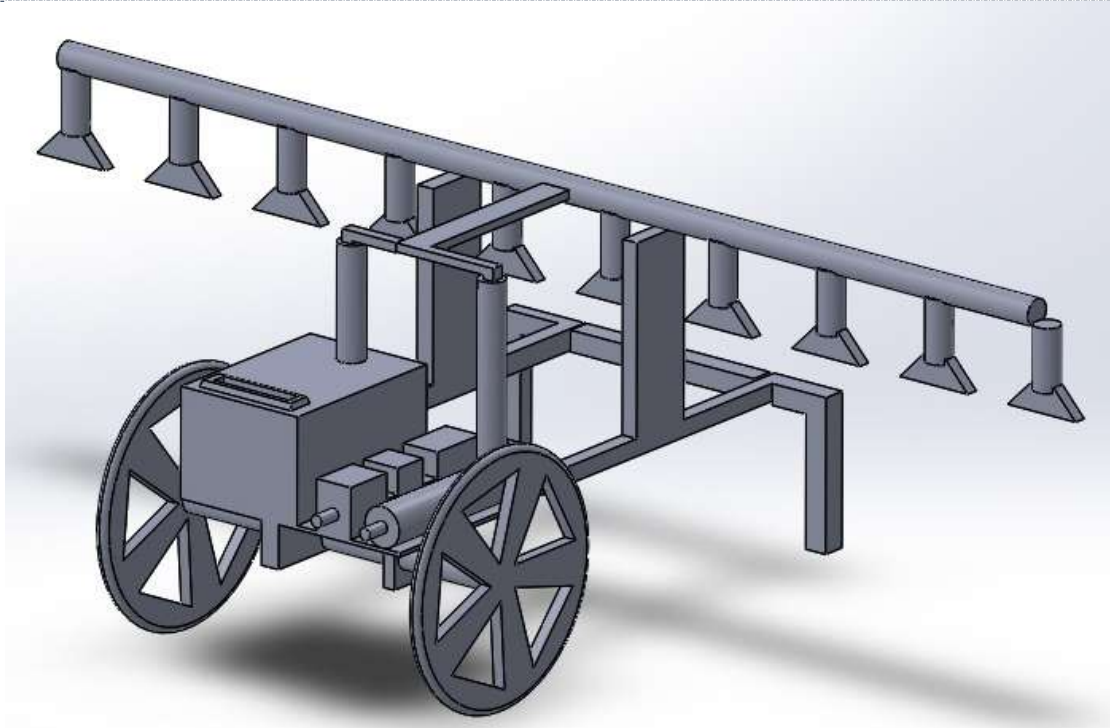


Fig 4.3 top view



*Fig 4.4 isometric view*

## LIMITATION



## CONCLUSION

The multinozzle agricultural sprayer can be used to reduce the human effort and uniform productivity is possible for all the location of the land. The design is great alternate for existing design of sprayers. That the small size equipment is very effectively performing the spraying time and location. In the spraying machine is to applicable for all the type of intermediate distance to the line of plants.

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