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Wheel Operated Fertilizer Sprayer

Nishkarsh Koche[1], Mayuresh Deshmukh[2], Abhijit Shrivastav[3], Noman Kha[4], Prof. Kapish T Dhalkulkar[5]
[1, 2, 3, 4, 5]*Mechanical Engineering Department, Drgitr, SGBAU Amravati*

Abstract: ***Different kinds of insecticides sprayer are available in India. As India is a land of agriculture which comprises of small and rich farmers. Small scale farmers are very interested in manually level operated knapsack sprayer because of its versatility, cost and design. Spraying is an important operation to be performed by the farmers to protect the cultivated crops from insects, pests, funguses and diseases in which various insecticides, pesticides, fungicides and nutrients are sprayed on crops. So this gadgets which we called wheel operated fertilizer sprayer can be operated manually for spreading granular materials in farms especially for solid fertilizers like urea. When the vehicle is pushed, motion is transferred form rear axle wheels which through sprocket and chain mechanism which in turn rotates second sprocket connected to a shaft having screw conveyor at both the ends. This rotation of screw conveyor will discharge the fertilizer which is supplied through a hopper acting a storage tank.***

Keywords: Fertilizer Sprayer Wheel operated Trolley, Slider crank mechanism, Compression Chamber, Chain and sprocket.

I. INTRODUCTION

As India is a agriculture country, around 66% of population depends upon agriculture. However, its contribution to GDP is now around one sixth, it provides 58% of Indian work fAorce. As spraying is an important operation in agriculture. Therefore the application of liquid fertilizers, insecticides, herbicides and pesticides are done with the aid of sprayers. The benefits of using sprayers for chemical application includes, capability of applying at the desired level, case to operate, little or zero maintenance, enhancement of uniform distribution of the contents.

The current backpack sprayer has lot of limitation and it required more energy to operate. So the aim of developing such a concept is primarily because of preventing 3 major drawbacks of the pump being used currently firstly, the farmer has to carry the entire weight of the pesticide spraying pump on his shoulder; secondly, he has to continuously use his one hand to pump using the handle; thirdly, reduction in spraying time. All these factors have been taken care of in this project along with being cost effective, light in weight and good in strength.

The pump already available with the farmer can be directly used in this mechanism. The handle of the sprayer will be mechanically operated through the rotation shaft of the wheel of the cart using an efficient mechanism. This will result into the reciprocating motion of the piston and now just have to push the cart and the whole mechanism will be operated with case. This will be a case of pure mechanical Automation.



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II. LIST OF ATOMS USED

Sl. No.	Name of component	Material used	Material specification
1	Frame	M.S	Cheap, durable, good strength
2	Tank	plastic	Light in weight durable
3	Nozzle	plastic	Traditional sprayer
4	Pump	Steel	Pressuring Liquid
5	Wheel	Steel	Durable in weight
6	Type	Rubber	For friction purpose
7	Sprocket	steel	Power transmission

III. APPLICATION

1) Its major use in agriculture to spray fertilizer.
2) In city and urban area, it can use for spraying water on lawn.It may be exercise device at morning during utilize in lawn. Use from spray chemical Pesticide in plants in farm.
3) It is use for spray painting in industry
4) It is use for spray water in garden on the plants.
5) It is use for transfer water from one place to its nearer place.
6) For the insecticides application to control insect pests on crops and instores, houses, kitchen, poultry farm burns etc.

IV. ADVANTAGES

1) It does not require any kind of non-renewable energy is mechanical, electricalenergy.
2) It reduces the fatigue of operator during the operation.
3) It increases the efficiency of operator
4) It can cover more area of land during spray.
5) It can adjust the height of spray by using adjustable
6) Its cost is less than electrically and solar operated pump.

V. DISADVANTAGES

1) In irregular area of land, it can difficult to operate.
2) In rainy days in muddy environment it is difficult to operate.
3) For irregular crops this pump is difficult to work.
4) The flow is not uniform, so we have to fit a bottle at both ends.
5) The flow is very less & Can't be used for high flow operation.

VI. CONCLUSION

No design is ever perfect for all the time; design needs to be changed as per the needs and wants of users. Inputs for new product development and or design improvements are obtained from the user's feedback and product evaluation with respect to user requirements. The major outcome from this effort of new product development is concluded below:

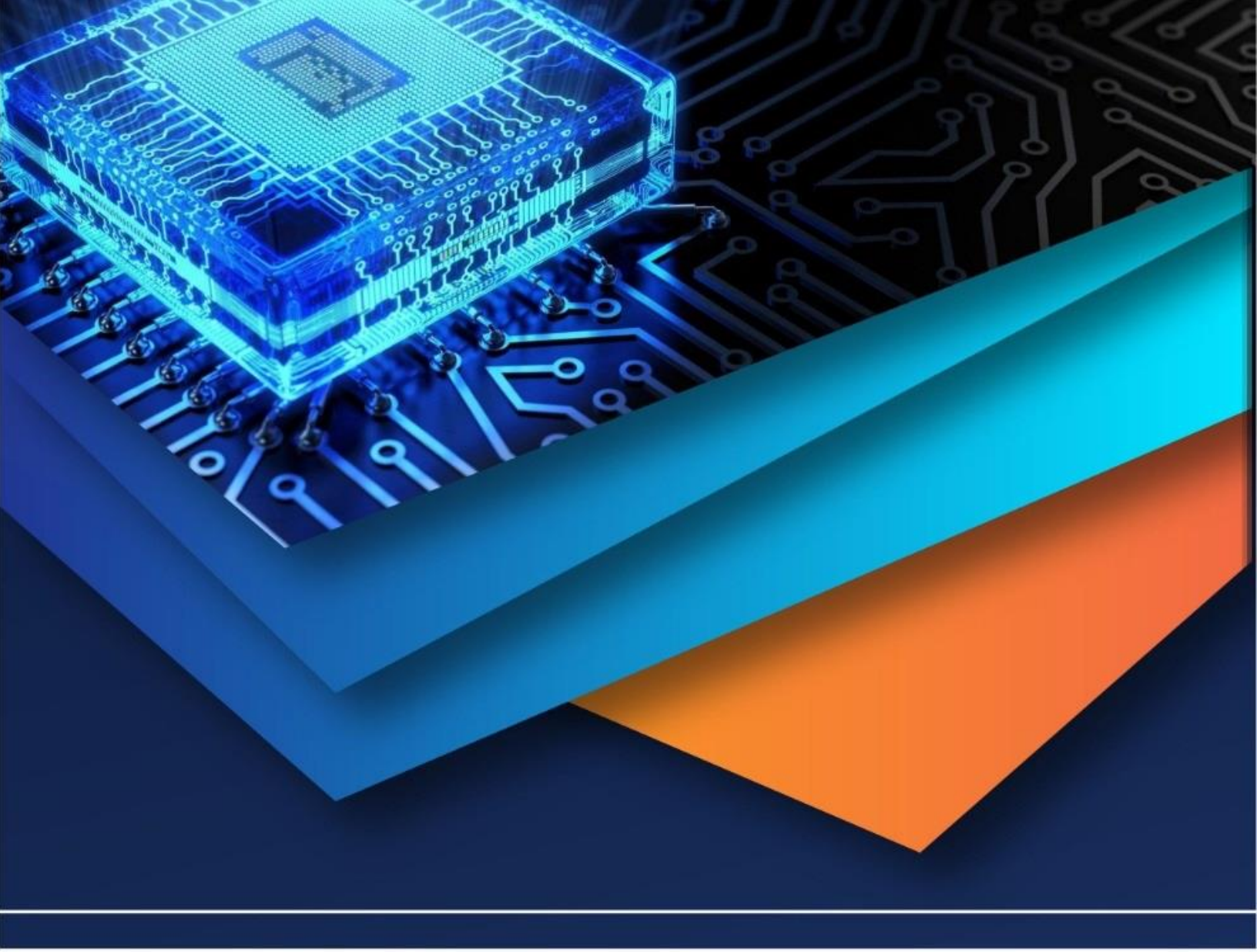
1) Working prototype of the mobile pesticide sprayer was designed and developed.
2) The pesticide sprayer reduces back ache and shoulder pain while using the product.
3) The cost of the product can be brought down if mass production can be considered. The product can spray pesticide over multiple rows of plants in one pass there by reducing manual effort.

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