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Design and Development of Multipurpose Farming Machine

Harshvardhansinh Mahida[1], Mandipsinh Mahida[2], Hardikkumar Panchani[3] , Brijesh Variya[4]

[1]*Mechanical Department*
Shree Swami Atmanand Saraswati Institute Of Technology

Internal Guide:- Prof. Manish Savaliya

Faculty Guide(Mechanical), Shree Swami Atmanand Saraswati Institute Of Technology

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Abstract - Multi-Purpose Farming Machine can be defined as a device/machine/equipment which is used in agriculture field to remove weeds, digging process, cultivate the soil.

This machine works with manpower with the help of two guide wheels to remove the weeds near the plants and also cultivate the upper soil. Another attachment of hope wheel which can be replaced in place of guide wheels can be used for digging process.

***Key Words*:** Agriculture, Cultivate, Multipurpose, Cost reduction, Reduce labors, etc

1.INTRODUCTION

Agriculture is most important in our life and nation. So that there are various farm machines available in every countries. The individual plants are specialized in surroundings and soil classification. After the cultivation process seeds are placed under the soil. The growth of the plants is done by applying water and fertilizer. Weeds are removed by sickle and sickle is also used for harvesting crops and other vegetation but it consumes a lot of time and manpower. It can also cause injury to the labors.

So we developed a manually operated machine for small scale farmers to help them do more than one operations in required in farming in a single machine like cultivation, digging and an addition of pesticide spray pump for a very affordable cost.

In addition to this the design of the machine is very flexible as it can detach and add various parts as per the requirement of the operation making it very ergonomic design.

2. LITERATURE REVIEW

WEED REMOVING MACHINE FOR AGRICULTURE

The effective design of weed removing machine is to minimize the time taken for removing weed present between the growing plants. The vertical adjustment is to increase and decrease the height of the secondary rotating shaft and the rotary blades. It is mainly focused to increase the growth rate of plants. The horizontal distance can be adjusted by increasing the distance between the individual blades of the machine. The blades are rotated in clockwise direction with respect to the weed elimination. The depth of the removal is controlled by the handle. The power is transmitted from engine to the primary shaft. The primary shaft is connected to secondary shaft. The cam shape of shaft is to transmit the power to the blade by using chain drive. The specification of design is the number of blades, which can be increased and decreased with respect to our requirement. The compact design is very helpful for in the field of agriculture.

3. Working and New Things

(i) Weed removing process:
In farm the weed removing process is necessary. Weed generally grow in vegetables and sugarcane farms because this plant requires water regularly and also vegetables farm have 70 % moisture in soil by this machine we can easily remove weed near the plant. For removing weed many labors are required and this labors remove the weed by sickle, which take more time and in another way farmer use medicine to kill the weed and it harms the vegetables. With attachment of the blade in this machine we can easily remove the weed and also cultivate the upper soil. In this process weed are cultivated with soil and converted into the fertilizer by biological processes.

(ii) Digging Process:
Generally crop of vegetables and tissues and crop of sugarcane require proper distance like 4 inch, 8inch, 12 inch, 16 inch, 24inch, 48inch. In India all over 90 % farmer are small scale farmer. It is difficult and expensive to purchase automatic machine for digging process. So farmer digs the soil by hand and marks the distance by using rope or mark roughly. So they are prone to injury and more workers are required. By attachment of this wheel it marks distance at proper limit and also digs a hole in the soil to insert the crop tissue.

(iii) Pesticides spray process:
Insects damages the plants and spoil the vegetables in farm, so farmers use pesticides to remove and kill the insects. Generally pesticides are provided by pumping process. This pump is carried by farmers on their shoulder. So Farmers suffer from back pain and this makes it difficult for them to spray the pesticides in farm. In this machine we have provided a space on chassis to put the pump for spraying pesticides. So farmers can easily spray medicine in farm.

Fig -1&2: Experimental Work

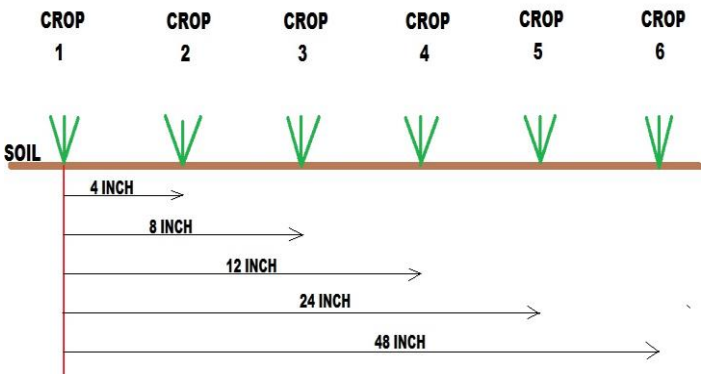


Fig:-1

Here, 48 Inch = 121.92 cm
≈ 120 cm

Now, If we design a wheel then,

$2\pi R = 120cm$
$2 * 3.14 * R = 120cm$
$R = 19cm$

So, the diameter of the wheel is 19cm.

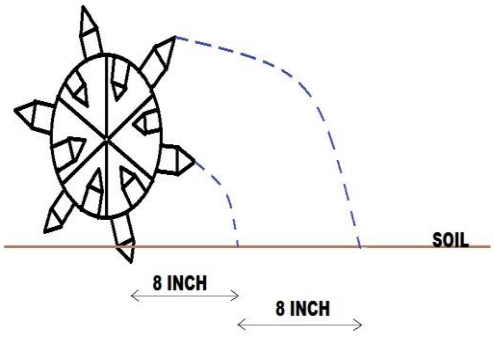
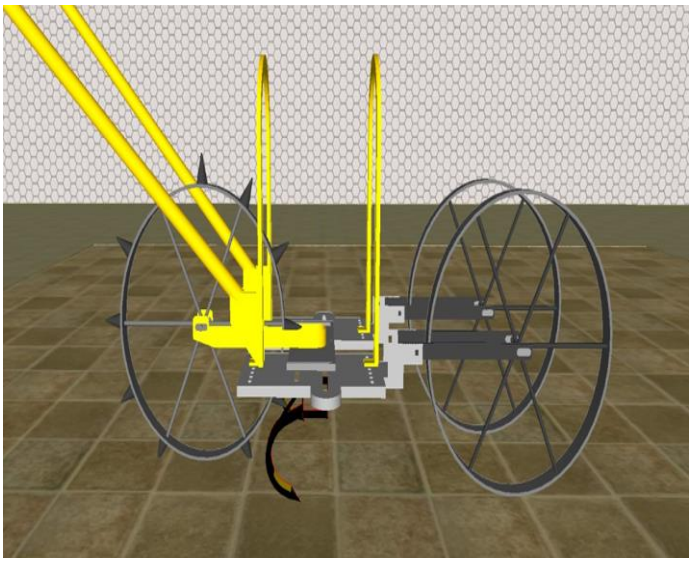
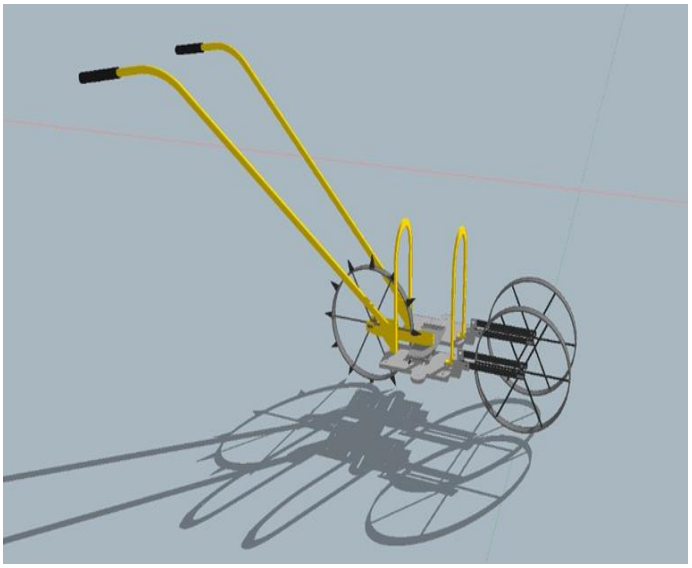


Fig -2

4. Final Design



With blade



With hope wheel

CONCLUSIONS

By using this product farmers can work efficiently with less manpower, less cost and less time and work can be done with greater efficiency. Because it works on manpower the handling of this machine is easy.

REFERENCES

(1) WEED REMOVING MACHINE FOR AGRICULTURE By Albert Francis A, Aravindh R, Ajith M,and Barath Kumar M

(2) DESIGN AND DEVELOPMENT OF MANUALLY OPERATED SEED PLANTER MACHINE By Ani kyada and Dhaval Patel

(3) DESIGN AND DEVELOPMENT OF WHEEL SPRAY PUMP By Sivanainthaperumal.T, Selvam.M, Pandiyaraj.Rand Arunraj.S

(4) MULTI-TASKING AGRICULTURAL MACHINE TOOL By Swetabh, Manish Kashyap, Yash Yadav , Ashutosh Singh , Dhruv Kumar

(5) MN AGRO INDUSTRIES By Arun Patel