DESIGN AND DEVELOPMENT OF SOLAR POWERED WEEDING MACHINE

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ABSTRACT: This paper focuses on the various techniques used for weeding purpose for agricultural implants which have a scope to be used in future. The implants used in conventional methods have some side effects. The effective properties of solar powered weeding machine is suitable for weeding purpose and have no side effects.It avoids the use of any chemicals and hence prevents the crops from chemicals.

KEYWORDS: Solar energy,sustainable crop production, weed

INTRODUCTION: Solar Weeding machine is the machine that operates on solar energy. Now,Solar energy is radiant light and heat from the Sun that is harnessed using a range of ever-evolving technologies such as solar heating, photovoltaic, solar thermal energy, solar architecture and artificial photosynthesis.It is an important source of renewable energy and its technologies are broadly characterized as either passive solar or active solar depending on how they capture and distribute solar energy or convert it into solar power. Active solar techniques include the use of photovoltaic systems, concentrated solar power and solar water heating to harness the energy.

METHODOLOGY:

Various type of papers have been reviewed on Solar powered weeder from this we lead to gap analysis that one wheeler solar powered weeder is more satisfying and cheaper than those chemical and other conventional weeders.Thus the problem definition of the project is controlling the weeds in the agriculture field. Also the labour required for weeding is expensive,time consuming and difficult to organize,while the main objective is to built a machine that will overcome the above bottlenecks.In this project we are going to prepare a weed removing machine for agricultural land and to reduce the human effort of weed elimination weed elimination and to create a machine for low cost using solar energy.Later model design and fabrication will be done.

LITERATURE REVIEW:

M.G.Jadhav, et al [1]presented principles of motion of trolley which transmit its rotary motion from chain and sprocket arrangement and reciprocating piston into the cylinder for pumping the pesticides which is used to the manually operated organic fertilizers cum pesticides sprayer.

R.Y. Van Der Weide, et al [2] Studied concern about herbicides polluting ground and surface water, human health risks from herbicide exposure or residues, effects on the flora and fauna, development of herbicide resistance and the lack of approved and effective herbicides for minor crops such as vegetables, are the major factors driving the present and increasing interest in non-chemical weed control.

Manish Chavan, et al [3] found one of the major reasons for lack agricultural productivity is weeds. So they decided to select a project based on weed removal machine. Weed is an everyday term usually to describe a plant considered undesirable. The word weed is commonly applied to unwanted plants in human-controlled settings, such as farm fields, gardens, lawns, and parks.

G.Selvakumar, et al [4] concluded that there is a problem with removing weed such as the design of the weeder machine removes weed only in vacuum land for cultivation. If the sensor is used in the machine,sometimes it may cause damage to the plants when the plant was falsely regarded as a weed. This machine has only the primary cutter called weeder. So it cannot be adjustable to remove the weeds at a distance after cultivation i.e, at the time of plants are growing.

Francis et al., [5] In this present day elimination of weeds in agricultural uncultivated land is done by various machines, which are available.But there is no special machine for eliminate the weeds in cultivated agricultural lands.The weeds reduces the growth of plants and productivity.The existing machines for cultivate the land by using the source of fuel .The previous design of machines consumes maximum amount of fuel.It can be reduced that various innovators are designing the solar powered machines.But it can't work for long time.The climatic conditions also affects the performance.

M. Reddi Sankar et al [6] Solar assisted bicycle is modification of existing bicycle and driven by solar energy. It is suitable for both city and country roads, that are made of cement, asphalt, or mud. This bicycle is cheaper, simpler in construction & can be widely used for short distance travelling especially by school children, college students, office goers, villagers, postmen etc.

Gaurav Lohakar et al [7] The paper provides a brief review of research on the agricultural machine about future. This agricultural machine design and fabricated to facilitated the former to working in simplicity manner and improve productivity.

P.Amrutesh et al [8] The mechanism which is used i.e. scotch yoke mechanism does not given excepted efficiency. This efficiency can be increased by using some other mechanism and speed of motor is reduce because of heavy material used and this material can be replaced by using light weight material and design of blades should be done based on types of grass is used to cut.

Ashish kumar chaudhari et al [9] presented paper provides the fabricated information about the "Fabrication of Solar grass Cutting Machine" which was designed such that the solar plate generates solar energy and utilizing this energy for running the grass cutter motor.

Alberto Assirelli et al [10] These first experiences with photoelectric and capacitive sensors have provided us with positive insight on using both sensors on the same command module. The system appears to have the characteristics required for a vehicle-mounted system, therefore it is advisable to replace the direct contact approach used up to now with these detection systems.

Gudur S.E. et al [11] The present research has dealt with solar rotary tiller design for the power tiller that is made for using in primary and secondary tillage. Comparative study for portable weeders and power tillers in the Indian market is discussed.

N.Sasikumar et al [12] Research and Development on solar technologies / solar thermal storage systems, testing facilities towards the development of solar technologies will be encouraged. Technology Demonstrations on innovative projects in association with reputed institutions will also be encouraged.

Praful P. Ulhe et al [13] successfully done manually as well as motor driven in a grass cutter .Remote operated system is also implemented due safer and easy for the working and the spiral blade gives the cutting efficiency more and the collecting of grass cutter is done easily.These grass cutter is light weight and space is less occupied .as it is solar powered the running cost is zero. The cost of the system is low as compare to the market grass cutter.

K.Sravan Kumar et al [14] The project aims at fabricating a grass cutting machine system which makes the grass cutter based motor running through solar energy.

Ashwini D. More et al [15] proposed model of weed cutter vehicle which is replacement of the manually operating different type of tools. This cutter is based on solar energy, plays vital role in agriculture sector and totally eco-friendly. This vehicle is easy to operate, pollution free and automatic.

Ernest L. Hall et al [16] A brief survey of robot lawn mower products, patents, prototypes and promising technologies has been presented. The lawn mower provides an excellent educational testbed device and may become the first breakthrough in personal robots.

Dr. Pusphavalli M et al [17] This paper permits the idea about the automatic detection and removal of weeds in the agriculture field. Especially the removal of weeds mechanically. So the usage of herbicides in the agriculture field is avoidable.

Pramod R et al [18] Presented weed remover system which is sustainable alternative mechanical solution for controlling the growth of the weeds.This design aims to help poor farmers who are dependent on aquaculture for a living and are affected due to the excessive growth of the we

C. Cordill et al [19] A mechanical weed control machine containing a sensing arrangement, control algorithm and dual mechanical end effectors was successfully developed and tested.

Kamarul Hawari Ghazali et al [20] uses machine vision system is to detect the existence of weed as well as to distinguish its types. The core component of machine vision system is its image processing technique that can detect and discriminate the type of weed namely as narrow and broad.

Dwight D. Ligenfelter et al [21] studied classifications of weeds,cost of weeds and benefits of weeds

Manuel Pérez-Ruiz et al [22] Developed a semiautomatic intra-row non-chemical weeding machine and operated using a mechanical weed knife system and odometry information in real-time to determine the open and close events of the weed knives to control the knife path to circumvent the crop and eliminated the intra-row weeds.

D.C.Slaughter et al [23] Described a fully automatic system developed at UC Davis for intra-row mechanical weed control for processing tomatoes in California also developed a novel weed control system using a real-time kinematics (RTK) global positioning system (GPS) to automatically control the path of a pair of weed knives based upon an automatically generated GPS plant map.

Monalisha Sahu et al [24]Designed a manually operated multipurpose power weeder operated by a 1.33 kW engine and weighing 20.4 kg and developed for weeding with minimum plant damage and power requirement for both wet land and dry land paddy filed.

Rajashekar M et al [25] A single row wheel weeder was conceptually designed first using CATIA and analysed, optimized using ADAMS software.

Victor Rueda-Ayala et al [26] The alternative weeding methods without herbicides described in this chapter present a high potential to successfully compete with herbicide treatments. For instance,weed harrowing or a combination of flaming with mechanical tools, has shown an increase in crop yields due to the achieved weed control, up to a similar or even higher level than that obtained with chemical

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Ogunlowo, Q. O. et al [27] A guided horizontal conveyor rice harvester that uses slider-crank mechanism to drive the cutter bar was designed and constructed. Most Nigerian farms are segregated and this makes it difficult to make use of combine harvester as mechanical means of harvesting.

Robert Warren Hicks et al [28]surveyed lawn mowing is considered by many to be one of the most boring and tiring routine household task.It is also one of the most promising personal robot applications.Several devices have now been invented and some manufactured products are for lawn mowing.the purpose of the

survey is to find the available products typical patents and some testbed prototypes are presented.

Mahesh Gavali et al [29] Comparative study for portable weeders and power tillers in the India market is discussed. Various methods used for weed removal in crops are also discussed. Main focus of this is to study various equipment's used for mechanical weed removal. This study revealed that most of the Indian farmers, majority of which are small scale farmers can afford only portable weeders.

FUTURE SCOPE: In future,use of weeding machines will increase and it will reduce human efforts,time which will increase the productivity of crops.

CONCLUSION: Weeds are harmful for the crops hence would be removed.The weed cutter is safe as all the materials used can be recycled and does not polute the environment as it is driven by solar energy.It is not so complicated mechanism and can be run by anyone.

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