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DESIGN AND FABRICATION OF MECHANICAL SICKLE

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ABSTRACT

In this two wheeler operated sickle bar mover which is mechanical device used for cutting crops and grass. It have simple working and construction. Our project is mostly followed engineering designing, to get the best result. In present work, we performing design calculation and cad modelling . There are 2 cutting blade one is movable (reciprocate over fixed blade)and rigidly fixed to the frame. When 2 wheeler move forward then mover wheel firstly rotates shaft, afterwards gear, cam arrangement and cam convert rotary motion into reciprocating motion and finally cutting force obtained on blade edge. Sickle mover was designed for exploring its adaptability to decline problems of farmers in terms of cost and time. The project designed to uses in level areas, like, play ground ,lawn, yard and more in agriculture sides. Wheels gives motion to the scotch yoke mechanism to cut crops. There's use of the conventional energy. It run without help of electricity.

KEYWORDS: Sickle bar mover, Bevel gear, Bearings, Scotch yoke mechanism,Agriculture,Cam arrangements.

I. INTRODUCTION

Multi crops cutting device is nowadays very popular among farmers. Mostly this devices are used for soft grass furnishing. This project crops cutter machine we are aimed to develop for operation and construction. Indian economy is mostly depends on the field of agriculture. There's great scope of crops cutter machine in India . In our neighbourhoods countries it is used in various fields for cutting the crops. The machine may consist of two, three or more blades depending upon the machine needs. The crops cutting machine is known as sickle mower. This machine is available in the various types. but these are expensive and non-affordable also it's requires a skilled farmers to control it.

Though, it was seen that their is necessary to have a crops cutter with less initial cost and can be controlled by non-skilled labour the devices required for manufacturing includes grinding machine, welding machine etc.

The principal of device is based on scotch-yoke mechanism. There is high speed rotation blade provided to cut the crops.

II. LITERATURE REVIEW

In 1827 Edwin Budding in Stroud, Gloucestershire invented first lawn mower. Budding's designed the mower primarily for cutting lawn on play grounds and gardens, as a high-level alternative to the scythe, and it was patented in 1830. About 10 years required for further innovations to create a device that could be worked by animals, and 60 years required to built a steam-powered lawn mower. On May 18, 1830, there was agreement between John Ferrabee and Edwin Budding . The costs of development, paid by Ferrabee to obtained letters of patent and took the rights to sell, manufactur and license other manufacturers in the production of lawn mowers. In 1859 ,Thomas Green produced the first chain-driven mower. In 1860s manufacture of lawn mowers began .By 1862, Farrabee's company was making eight models in various roller sizes.

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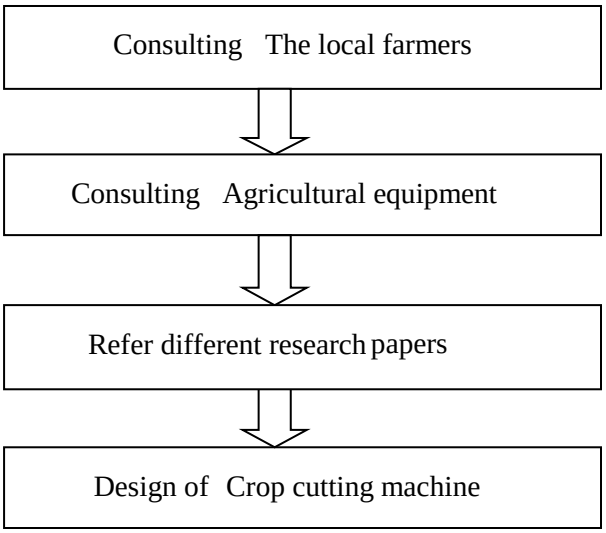
III. METHDOLOGY



IV. WORKING

This innovative Machine performs generally three operations cutting, collecting and bunching of the crops. The engine is mounted on the frame using nut and bolts. With the help of cam drive, Engine and input shaft of bevel gear box is connected. The bevel gearbox whose output shaft one end connected to the cutting mechanism using crank shaft system while other end connected by collecting mechanism with belt pulley system while other end We're using one blade is moving and other is stationary. The slider crank used to convert rotary motion of wheels to reciprocating motion for cutter. Basically this machine working on principal of scotch-yoke mechanism.

V. RESEARCH ON PAPER

A. Ashish Kumar Chaudhari

Chaudhari have prepared manually operated handle machine which have availability to cut the grass. This machine consists of linear blades and it does not affected by any weather & climatic conditions. The basic purpose of this paper is to move the crops cutter is various directions to prepare different designs as per needs. By considering link mechanism the altitude of the cut can be decided. The unskilled small-scale labour can easily operate this machine .

B. Edwin Beard Budding

Edwin purposed this idea of the sickle mower after watching a device in a local cloth mill which used a cutting cylinder mounted on a bench to trim cloth to make a smooth finish after weaving. Edwin thought that a same idea would considerable for the cutting of crop if the mechanism could be mounted in a wheeled frame to make the blades rotate close to the lawn's surface.

VI. RESULTS AND CONCLUSION

Our calculation following result were drawn for the work to be in one acre area with a single crop cutter or manually, even by using a multi crop cutter we can achieve the same work in the same area with only 1 labour. Therefore, time can also be saved by using the multi crop cutter. It is concluded that the device is most economical.

we concluded that the device is comparatively compact and very easily operated. This device has ability to run on field smoothly and the least efforts of farmers required. The cost of harvesting using this machine is considerably less as compare to manual harvesting. The harvesting available in market are mostly suitable for

large farms, so this can be the best machine for the small -scale farmers. The success rate of device depends on how the farmers operate this machine as their manually.

VII. REFERENCESES

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