COCONUT PLUCKINGWITH VISION SYSTEM

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Abstract: A common issue that is looked by the coconut cultivators of home stead lands is coconut reaping where we have distinguished a straightforward and smaller framework to cut the coconuts effortlessly. The intense lack of work and high work cost is one reason behind this situation. In purpose of customary coconut cutting werely up on works for coconut gathering so we have thought of not relying up on labors. Normally, collectingis finished by a work climbing the highest point of coconut tree and putting down the coconut, due to work deficiency now the homestead proprietors aren't wining twos ticks joined with a snare where they think that its troublesome. We have concocted a thought of numerous sticks orchestrated in an adjustable (one inside another)way where the last stick is joined with a camera and shaper up held by a rack and pinion game plan.

Keywords—homestead land , proprietors, rack and pinion.

I. INTRODUCTION

Coconut cultivation is the one of the prime source of income for the landlord sin Tamil nadu. Coconut provides milk, oil, husk etc.. As we all know. Tamil nadu is one of the most fertile lands and also known for its oil compactness Coconut harvesting is over seen without any proper safety efforts which can provoke certifiable misfortunes. As mankind is progressing towards development it need not be a growth that overlooks facilitating the sector that is most important forums i.e. agriculture sector. A coconut climbing machine under the name coconut plucking robot was been developed with a robotic arm to harvest the coconut. It has wheels attached to it which makes it easy to climb and an robotic arm to cut the coconuts. A coconut climbing robot was also developed with the tree climbing assembly where it consists of two hexagonal aluminum frames joined by the hollow aluminum pipes at each vertex with respective vertex of other hexagon. It also uses a sickle or a bagging hook to cut the coconuts. A mechanism with six wheels which are mounted on three different alternate positions each on the lower and the upper frame of the bracket. Each six wheels are powered by 10rpm dc motor to move in both directions. The system is wired controlled and is operated from the bottom. A coco both as also been developed with a climbing mechanism and harvesting mechanism. The climbing mechanism consists of a octagon shaped crisis. The bunch of nuts is located by a vision sensor (camera) which is placed at the wrist of the arm. Multiple cameras with different resolution and different connecting method shave also been studied. Different types of materials for rod assembly in order to have a rigid weightless and stable material have also been studied and we found Mild Steel to be the most effective. With the help of this "Telescopic coconut plucking system "this traditional approach of harvesting the coconuts by risking a man's life can be transformed into a easier and safer than the traditional system. This system consists of a pipe like design which can reach up to a height of 25 feet making it easy for the harvester to pluck the coconuts from the ground. The topmost stick is supported by a rack and pinion setup which comprises of a cutter on one side and camera on the other. The machine makes use of a DC motor and DC gun. This method is cheaper and one time investment and also it is less in maintenance.

II.BLOCKDIAGRAM AND FLOW CHART

The microcontroller is the coordinator of the device. According to the user input microcontroller gives commands to the other unit which have to work and when should it work. The RF transmitter receiver creates a path between camera and smart phone. When the input for the upward movement is received the microcontroller drives the motor and the same procedure is repeated for the downward movement and cutter.
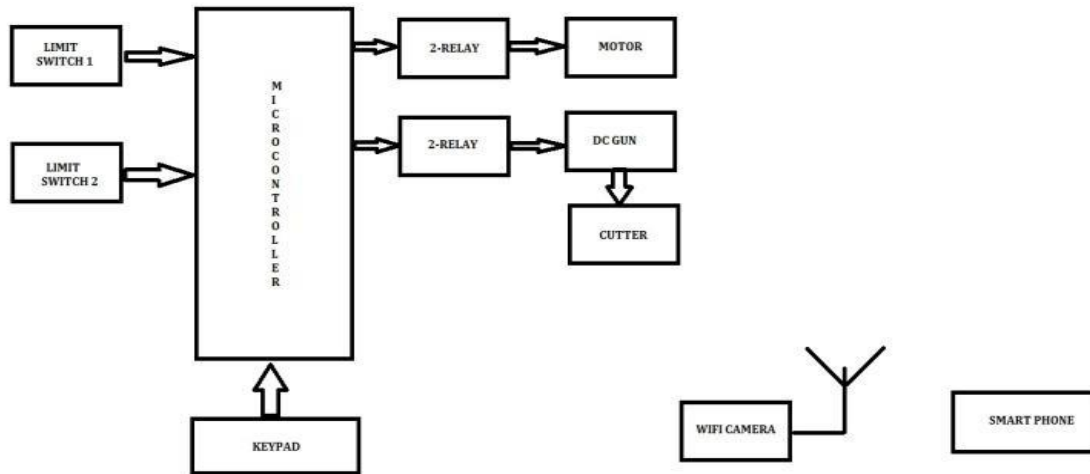
Fig.1: Block diagram

The flowchart of the project is as shown. The camera checks for the desired height if the desired height is reached then it checks for ripped coconuts or the height adjustment must be done till the required height is reached. After checking the ripped condition the hook adjustment is made and the coconut is plucked.
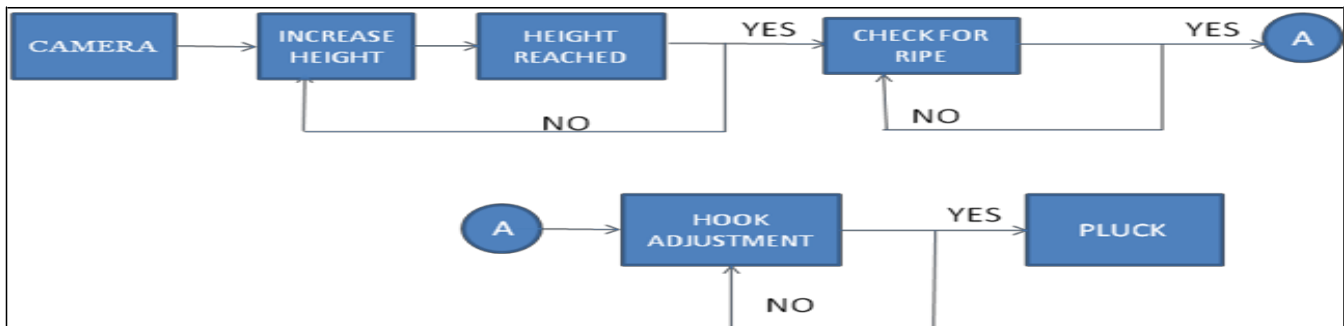

Fig.2: Flowchart

III.METHODOLOGY

.Our design strategy consists of the following components

They are:

1. Rack and pinion arrangement.

2. IP camera

3. Microcontroller

4. Relay and limit switch.

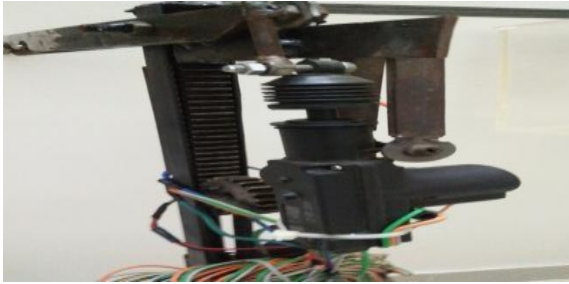5. DC gun & DC supply.

1. Rack and pinion arrangement:

Fig:BlockDiagram

This setup consists of two gears. The circular gear, pinion is mounted on the linear gear, rack. When the pinion is rotated it causes the rack to move corresponding to the pinion there by converting the rotational motion into linear motion. In our system the rack and pinion is powered by the DC motor. The rack carries the full load compared to pinion which carries the torque required. The rack has a teeth cut into and they mesh with the teeth of the pinion. When supply is given to the DC motor the rack moves up and down. Two limit switches are placed. One at the top and the other at the bottom. When the rack touches the limit switches the DC motor is programmed to turn off. The Rack and pinion setup is made up of mild steel (MS). Mild steel is commonly used as a general purpose engineering material. It is known for its toughness, ductility, durability and also it has a very good tensile strength. We opted mild steel because it has less air thrust when reached to different heights.

2. IP Camera

Fig.3:IP camera

The IP camera we used is capable of doing the following tasks:

CLOUD RECORDING: It keeps on recording in FTP server even if camera gets broken or any other damages occur.

360DEGREECONTROL:Itiscapableofrotating horizontally andverticallythroughamobile application.

IRNIGHTVISION:ItconsistsofHDnightvision withinbuiltIRlens.

AUDIO RECORDING AND SD CARD SLOT: Audio can be recorded also it has an inbuilt SD card slot for recording videos for future purpose.

3.MICROCONTROLLER

Fig.4:Microcontroller

ATMEL 89S52 is an effective microcontroller with low power, high thickness non unpredictable memory innovation. It is perfect with industry standard 80C51 direction set and pin out. It gives an exceptionally variable and produces powerful answer for implanted applications. This procedure is done just by joining a flexible 8-bit CPU with a programmable glimmer on a solid switch. It has preference of low power, superior C-MOS 8-bit microcontroller with 8Kbytes of programmable blaze memory. It can be reinvented by the on chip streak and by a customary non unstable memory programmer. AT89S52 has a standard element, for example, Watchdog

timer, datapointers,16bit clock and counter, 256 bytes of RAM, 8Kbytes of glimmer, full duplex serial port, ON-CHIP oscillator and clock circuitry. The microcontroller is planned with a static rationale for a task down to zero recurrence and it has selectable powers paring modes which is programming focused. The sit out of gear mode in microcontroller stops the CPU while permitting the clock, serial port and interfere with frame work to keep working. The Shutdown mode impairs the various chip capacities until the point that the following hinder or the equipment reset.

4. RELAY AND LIMIT SWITCH:

Relay is a switch which is operated electronically. It uses an electromagnetto mechanically operate a switch. It is used when a high power signal has to be controlled with a low power signal. Limit switches are switches which are used for turning ON and OFF a particular system when a limit is reached. In our system two limit switches are used one at the top and the other at the bottom of the last stick so as when the pinion reaches the limit switch the controller turns the D.C motor off.

5. D.C motor &D.C gun:

D.C engine is the most normally utilized electrical machine that movements over the electrical vitality into a mechanical significance. Inside a D.C motor there is an internal setup which is either an electromechanical one or electronic. D.C engine has an unending steed shoe magnet called as a stator and an armature called the rotor. Generally the present passing on wire passes on an appealing field which is constantly controlled by the battery. The improvement in the rotor is made by keeping the electromagnet in the engaging field of the continuing magnet. The rotor dependably encounters the mechanical power which is delineated by the left hand run the show. The engine utilized as a bit of this undertaking relies up on the stack given in the Mild Steel additionally a torque is made. Change of the rotor is all down and out upon the torque passed onto draw out the most phenomenal yield. In this structure the engine is but chered when the pinion achieves the most remote point switch. Trading the current in the engine can impact the armature to be harmed.

The D.C gun used here is operated with a voltage of 12 V or 24 V. It is an actuator with 2 wires and it is commonly used as a universal heavy duty power lock. It has two wires .D.C gun has a parting line which is sealed by an ultrasonic wielding. The D.C gun is made up of 100% original ABS, POM, nylon. It generates an amount of force which is possible enough to push or pull any material of about 6kg in industrial application. D.C gun inside it consist of a motor which is made up of a steel power metallurgical main gear which allows 100,000 times life cycle. The motor comes under a Japanese technology and is water resistant. D.C gun is equipped with a adjustable positioning hardware for easy installation and quiet operation. In this system the D.C gun has a task to give a push to the cutter for the opening and closing of it which is controlled electronically using a joystick.

IV. RESULTS & DISCUSSIONS

Fig.5: Rod assembly
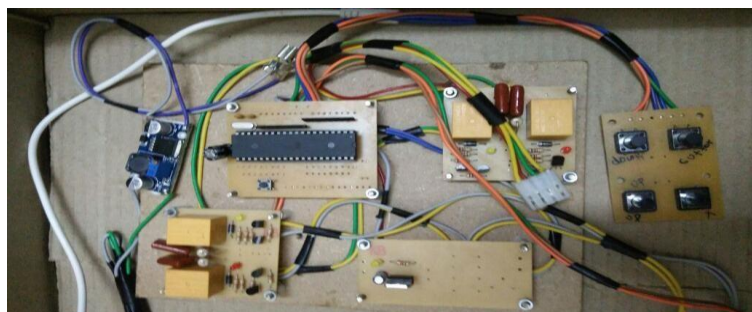

Fig.6: Rack & pinion

Fig.7: Board setup with joy stick

The accompanying pictures demonstrate the equipment setup that we have setup. It in corporate the pole get together that we have intended to meet the required stature. The rack and pinion get-together to change the situation of the shaper and the board setup appended with a joystick control to modify the situation of shaper and further more to cut the coconut.

V .CONCLUSION & FUTURE SCOPE

The hardships faced during coconut harvesting can be minimized by using this system. It has a simple structure which can be easily put to work. This system can be used by the society to handle the risky task of coconut farmers to pluck the coconuts instead of depending upon the labour. This system reduces the human efforts and also the risk factors involved in coconut harvesting.

Future scope of this project is in the field of Image processing using which we can distinguish between the ripped coconuts and then on ripped which allows us to harvest the coconut only which were require. In coconut farms, when the harvesting is done we have a plan of collecting all the data's in such as number of tree, amount of coconut harvested by linking those with the cloud. We have experienced a hardship off align of coconuts in the ground so we have an idea of setting up a rope mechanism so that the coconut   which   when   cuts   a   fell   lands   on   the   ground   using   that   rope   mechanism.

VI .REFERENCES

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