

Paddy Harvesting System Using Vacuum Inhalation Mechanism

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Abstract- This project is used to collect the paddies which are fallen in the land While harvest by the machine. The paddy and hull are fall down into the cropping field after then using the inhalation process to remove the fallen paddies in the cropping land. The collected hull and paddies are taken by the help of vacuum pipes. The collected hull is not used as food but it is used to rice bran for the cattle. Now a day's harvester machine is used to cultivate the paddies were minimum number of the paddies were dropped from the machine. Because of the process many people face difficulties to collect the paddies from the ground and most of the time was wasted for this processes. During the cultivation processes the most of the paddies has been fallen through air and vibration of the harvesting machine. The paddies have been dropped in the field about 10% of the paddies has been wasted from this processes. Hull also wasted during this processes.

Index terms- Arduino, Battery, Relay, Bluetooth Module, DC Motor, Vacuum pump

I.INTRODUCTION

For paddy, harvesting refers to the cutting and gathering of panicles attached to the stalks. Harvesting at the right time and in the right way maximizes grain yield and minimizes grain losses and quality deterioration. Once the plants have reached full growth (approximately three months after planting) and the grains begin to ripen-the tops begin to droop and the stem yellows-the water is drained from the fields. As the fields dry, the grains ripen further and harvesting is commenced. Many factors must be considered to obtain optimum rice harvest. The grain must be mature, high in quality

and have proper moisture content. Field should be sufficiently dry to support harvesting and transport. Timely harvesting ensures good grain quality, high market value and improved consumer acceptance. The right stage for harvesting is when about 80% panicles have 80 % ripened spike lets and their upper portion is straw colored.

Obstacle detection and avoidance robots are intelligent robots which can perform desired tasks in unstructured environments by finding and overcoming obstacles in their way without continuous human guidance. In robotics, obstacle avoidance is the task of satisfying some control objective subject to non-intersection or non-collision position constraints.

II.EXISTING SYSYTEM

Harvesting is the process of gathering a ripe crop from the fields. Reaping is the cutting of grain or pulse for harvest, typically using a scythe, sickle, or reaper. On smaller farms with the minimal of mechanization, harvesting is the most labor-intensive activity of the growing season. The importance of in water harvesting lies in the fact that it can be stored for future use. Just as it can be used directly so also the stored water can be utilized to revitalize the ground level water and improve its quality. This also helps to raise the level of groundwater which then can be easily accessible. The harvest is the time when you reap what you sow. As a verb, to harvest something means that you pick or gather it. You might harvest your sweet corn late in the summer. As

a noun, harvest means the time of year when crops are ripe and ready to be gathered

III. PROPOSED SYSTEM

Dropped paddies are collected from the ground and the Food production will grow during this processes. In normal harvesting processes were some 20% of paddies has been wasted by the harvesting machine were our project has been able to solve the problem by collecting the wasted paddies by the vacuum inhalation processes and their Hull also collected in this processes. Hull is used for food source for cows. Farmer will get benefited in our project and the paddies loss has been minimized.

BLOCK DIAGRAM

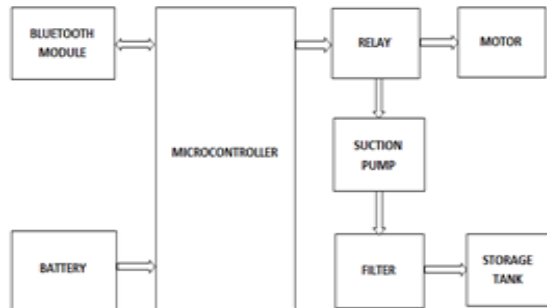


Fig. 1: Block diagram

Arduino has been used as the microcontroller for the source of controlling the entire system were Bluetooth module is used for connecting the device with mobile for operating the vehicle in forward backward direction and also for on off the vacuum inhalation which has been connected for rotating the wheels in forward and backward direction and 12V battery has been connected for the processes and 4 channel 5V relay module is used for controlling the dc motor power supply for the system. Vacuum has been connected from the relay when the relay has been on the vacuum has been started collecting the paddies for the ground.

IV. WORKING METHODOLOGY

During the harvesting processes in the machine our processes used to collect the wasted paddies in the vacuum inhalation processes but controlling the device in our mobile through the Bluetooth connection and most of the wasted paddies has been

collected any the wastage has been minimized. Arduino can be used to develop interactive objects, taking inputs from a variety of switches or sensors, and controlling a variety of lights, motors, and other physical outputs. Arduino projects can be stand-alone, or they can be communicating with software running on your computer. The solar powered lawnmower is operated by the switch on the board which closes the circuit and allows the flow of current to the motor which in turn drive the blade used for mowing. The battery recharges through the solar charging controller. Vacuum cleaners can release large concentrations of particles, both in their exhaust air and from resuspension of settled dust. However, the size, variability, and microbial diversity of these emissions are unknown, despite evidence to suggest they may contribute to allergic responses and infection transmission indoors. This study aimed to evaluate bio aerosol emission from various vacuum cleaners.

V. HARDWARE DETAILS

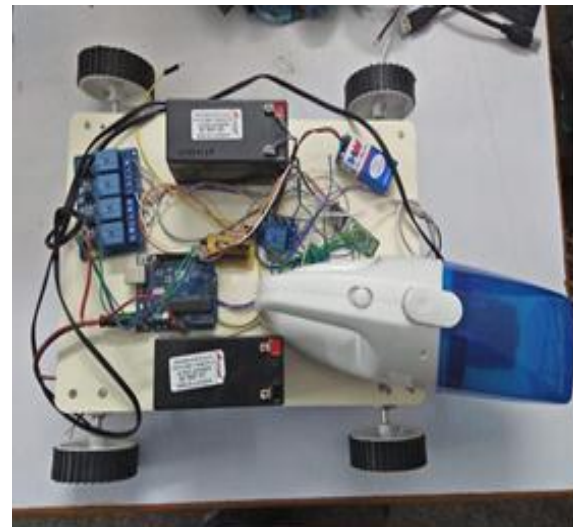


Fig. 2: Hardware

A. DC Motor (Rotating the Wheel)

In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field.

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy.



Fig. 3: DC Motor (Rotating the wheel)

The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal change the direction of current flow in part of the motor.

B. Battery

It is rechargeable Type. A battery is one or more electrochemical cells, which store chemical energy and make it available as electric current. There are two types of batteries, primary (disposable) and secondary (rechargeable), both of which convert chemical energy to electrical energy. Primary batteries can only be used once because they use up their chemicals in an irreversible reaction. Secondary batteries can be recharged because the chemical reactions they use are reversible; they are recharged by running a charging current through the battery, but in the opposite direction of the discharge current. Secondary, also called rechargeable batteries can be charged and discharged many times before wearing out



Fig. 4: Battery

After wearing out some batteries can be recycled. When a battery is supplying electric power, its positive terminal is the cathode and its negative terminal is the anode. The terminal marked negative is the source of electrons that will flow through an external electric circuit to the positive terminal. When a battery is connected to an external electric load, a redox reaction converts high-energy reactants to lower-energy products, and the free-energy

difference is delivered to the external circuit as electrical energy.

C. Bluetooth

Bluetooth is a wireless technology standard used for exchanging data between fixed and mobile devices over short distances using short-wavelength UHF radio waves in the industrial, scientific and medical radio bands, from 2.400 to 2.485 GHz, and building personal area networks (PANs).



Fig. 5: Bluetooth Chip

It was originally conceived as a wireless alternative to RS-232 data cables. Bluetooth is managed by the Bluetooth Special Interest Group (SIG), which has more than 35,000 member companies in the areas of telecommunication. The IEEE standardized Bluetooth as IEEE 802.15.1, but no longer maintains the standard. The Bluetooth SIG oversees development of the specification, manages the qualification program, and protects the trademarks. A manufacturer must meet Bluetooth SIG standards to market it as a Bluetooth device. A network of patents applies to the technology, which are licensed to individual qualifying devices. As of 2009, Bluetooth integrated circuit chips ship approximately 920 million units annually. It is one of the best communication devices to nearer communication.

D. ARDUINO

Microcontroller is a computer on a chip. Micro suggests that the device is small, and controller tells you that the device' might be used to control objects, processes, or events. Another term to describe a microcontroller is embedded controller, because the microcontroller and its support circuits are often built into, or embedded in, the devices they control. It is temporary storage unit. Arduino is an open source microcontroller which can be easily programmed, erased and reprogrammed at any instant of time. Arduino uses a hardware known as Arduino development board and software for developing code

known as IDE. The micro controller board used in our design is Arduino Uno. The Arduino UNO ATmega328 microcontroller is the MCU used in Arduino UNO R3 as a main controller. ATmega328 is an MCU from the AVR family; it is an 8-bit device.



Fig. 6: Arduino UNO

Which means that its data-bus architecture and internal registers are designed to handle 8 parallel data signals. Most articles explain the software of Arduino. A good grasp of the electronic design of your Arduino hardware will help you learn how to embed an Arduino in the design of a final product, including what to keep and what to omit from your original design. Before we can understand the UNO's hardware, we must have a general overview of the system first.

E.5V - 4 Channel Relay

Electrical Relays however, are basically electrically operated switches that come in many shapes, sizes and power ratings suitable for all types of applications. Relays can also have single or multiple contacts within a single package with the larger power relays used for mains voltage or high current switching applications being called “Contactors”. As well as the standard descriptions of Normally Open, (NO) and Normally Closed, (NC) used to describe how the relays contacts are connected, relay contact arrangements can also be classed by their actions.



Fig. 7: 5V - 4 Channels Relay

Electrical relays can be made up of one or more individual switch contacts with each “contact” being referred to as a “pole”. Each one of these contacts or poles can be connected or “thrown” together by energizing the relays coil and this gives rise to the description of the contact types as being.

VI.RESULTS AND DISCUSSION

This project is more suitable for collecting the wasted paddies from the ground which is very much useful for the economic growth for our country and the implementation of the project will be very useful for the farmers in our country. Recent days most of the harvesting machine has been invented but they used for only cutting the crops and collecting the paddies and so much of paddies about 15% of the paddies has been wasted so in our project the wasted product has been collected by the method of vacuum inhalation method so it is very useful for collecting the paddies from ground without human work.

VII.CONCLUSION

Now a day harvester machine are used to cultivate the paddies were minimum number of the paddies were dropped from the machine. So the dropped paddies have been collected by the workers so it makes very difficult to collect the paddies from the ground. It was seen in the harvester season during the time of cultivation because we are farmers. Because of the process many people face difficulties to collect the paddies from the ground and most of the time was wasted for this processes. Thus, we believe that our project will be beneficial for various purposes & hence our efforts will be fruitful. So, we made a successfully obstacle detector robot having applicator, vacuum cleaner which have ability to move freely anywhere and along with it, it have ability to create its own path and it avoid obstacle by artificial intelligence provided by programming in microcontroller to perform action and IR sensor to sense the obstacle, it also clean the area where it move with vacuum cleaner which is its application

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