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Remote Control in Sprinkle Robot

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Abstract: *As we see there is enough wind and solar energy globally to satisfy as much as humanity's energy requirements. vertical axis wind turbines (VAWT) may as efficient as current horizontal axis system, might be practical and significantly cheaper to build and maintain than horizontal axis wind turbine (HAWT). They have other original advantages, like they are always facing the wind, which might make them a significant player in our daily routine for low cost, cleaner renewable sources of lifting water. The growing popularity of solar wind pumps in many rural areas, these areas typically have no access to electricity or shortage of electricity, which creates a problem when it comes to irrigation and watering livestock. VAWT's might even critical in mitigating grid interconnect stability and reliability issue currently facing electricity producers and pump the water from suppliers. Additionally cheap VAWT's may provide an alternative to the rain forest destruction for the growing of bio-fuel crops. In this project we attempt to design and fabricate a Savonius water pumping Vertical Axis Wind Turbine. And also we make our model hybrid- solar and wind mill operated water pump. The solar energy gained by the solar panel and convert that electrical energy into mechanical energy which causes to rotate the shaft which is connected to crank plate. The circular motion of crank plate uses to lift the water as it converted in up and down motion using crank mechanism.*

Keywords: *Agriculture; Irrigation; Water Pump; Sprinkler; Pressure Drop; Steel; Lath; Arduino;Microcontroller.*

I.INTRODUCTION

This robot can be operated using two different modes, by using RF remote in which it will help to move the robot manually in which we can turn on sprinkler wirelessly whenever we want. Another mode is an autonomous mode in which robot will move automatically and it will detect obstacle using ultrasonic sensors.

Irrigation is the mechanism by which plants are supplied with water by artificial means Irrigation decreases the production of weeds and increases the growth of plants to conserve soil nutrients Irrigation can support landscape conservation in growing crops,especially in periods of below average precipitation.

Water is slowly absorbed by plant roots; therefore, water consumption is minimized Irrigation enables farmers and gardeners to use water effectively to ensure the growth of plants.

II.LITERATURE REVIEW

Anjum Awasthi et al, (2013) (1). The proposed system in this paper is designed by considering the requirement of a sugarcane crop for Indian climatic conditions. The WSN in agriculture is new technology for information acquisition and processing in sugarcane field. It is more advantageous than the traditional agriculture techniques. This work structured the precision agriculture monitoring system by wireless sensor nodes and base station to record the data of sensor nodes. This is low cost system where the recorded information is transmitted to remote location using a GSM network via a SMS. The farmer may use the received information to control the parameters. This kind of wireless detection and control improves the effectiveness and efficiency of resources used, which leads to the improved production. The drawback of system is its dependency on the GSM network.

Chetana et al (2012) (2): The Automated Wireless Watering System is a user friendly system, which notifies the user about its status. The 2 modes of operations provide the user with the option of automatic and manual process. The system also provides the log file of the events carried out.

Cosmin (2012) (3): This investigation demonstrates that there is an unquestionable growing tendency in the adoption of artificial intelligence in agriculture. Computerized expert systems cover a broad area of farming but their number and complexity vary considerably from country to country. Underdevelopment of the IT infrastructure in many countries is the first obstruction in using them, only around 30% of the world population currently having access to these new technologies.

Jaichandran et al (2013) (4): A prototype for automatic controlling and remote accessing of irrigation motor. Prototype includes sensor node, controller node and mobile phone. The sensor node is deployed in irrigation field for sensing soil moisture value and the sensed data is sent to controller node. On receiving sensor value the controller node checks it with required soil moisture value. When soil moisture in irrigation field is not up to the required level then the motor is switched

on to irrigate associated agriculture field and alert message is send to registered mobile phone. Mobile phone is used for sending request SMS to get soil moisture value in irrigation field and commands can be sent as SMS to switch on/off the irrigation motor. Prototype is experimented by abstraction three pots containing soil with different moisture level as irrigation fields. The experimental results show that the prototype is capable for automatic controlling and remote accessing of irrigation motor based on the feedback of soil moisture sensor. The prototype can facilitate farmer in monitoring and controlling irrigation activity from remote location.

Kalyan et al (2011) (5): The need for systems that make agriculture easier and more sustainable has increased within the past few years. The ability to conserve two of the most important resources of a farmer, water and time, has been the latest challenge. A system that provides this ability - through the use of efficient and reliable methods such as wireless sensor networking, sprinkler irrigation, GSM, SMS technologies and readily available mobile phone devices – is certain to help the farmers get a better yield and on a larger scale, help the agricultural and economic growth of the country.

Muhammad et al (2010) (6): A simple approach to Irrigation control problem using Artificial Neural Network Controller. The proposed system is compared with ON/OFF controller and it is shown that ON/OFF Controller based System fails miserablybecause of its limitations. On the other hand ANN based approach has resulted in possible implementation of better and more efficient control. These controllers do not require a prior knowledge of system and have inherent ability to adapt to the changing conditions unlike conventional methods. It is noteworthy that ANN based systems can save lot of resources(energy and water)and can provide optimized results to all type of agriculture areas.

Prathyusha et al (2012)(7) : The Microcontroller based drip irrigation system proves to be a real time feedback control system which monitors and controls all the activities of drip irrigation system efficiently. The present system is a model to modernize the agriculture industries at a mass scale with optimum expenditure. They can provide irrigation to larger areas of plants with less water consumption and lower pressure. Using this system, one can save manpower, water to improve production and ultimately profit.

Priyanka et al (2012) (8) : involves some sensors, LCD display, GSM and ARM processor. All the sensors will give analog output but our processor will accept only the digital data. So we have to connect all the sensors to the ADC channel pins which are in- built to the processor.LCD will be on field display purpose. GSM module will contains a Subscriber Identity Module (SIM) user can communicate with this SIM-Number. When the particular command activated or given by the user, immediately the corresponding sensor will activates and reads the present reading and immediately sends results to the same user mobile and displays in the LCD panel in the field. Immediately user will take the necessary action if required. Here we are using total seven sensors to monitor the field condition. Those are Temperature, Humidity, Soil moisture, Leaf sensor, PH sensor, Level sensor, Phase sensor. All these devices are connected to the ARM processor.GSM is used for communication purpose, with the help of AT (attention)-Commands we can communicate with the components. For soil module and level sensing applications we are using motors. One motor is used to store water and another is for releasing the stored water into the soil.

Prisilla et al (2012) (9) : Water is one of nature's most important gifts to mankind, because of the increase in population food requirement for human being is also increasing. Over the past few decade usage of water for irrigation has increased hysterically. Water is polluted due to wastage and contaminants in the industries. Saving water is more important. This ultimate aim can be achieved by using the exiting ANN control system. It will providea way to save flood water in the fields for future irrigation purpose

Yethiraj et al (2012) (10): There is a growing number of applications of data mining techniques in agriculture and a growing amount of data that are currently available from many resources. This is relatively a novel research field and it is expected to grow in the future. There is a lot of work to be done on this emerging and interesting research field. The multidisciplinary approach of integrating computerscience with agriculture will help in forecasting/managing agricultural crops effectively.

III.METHODOLOGY

This is the order that Aurdino/ Node MCU receives In this case, the microcontroller sends a logic high signal, which activates a relay driver transistor and turning on the pumping motor As a result, water flow begins. The soil resistance decreases as the soil becomes sufficiently wet, allowing an available voltage to the non-inverting input resulting in a comparator's output that is high logic and provided to the microcontroller.

In this case, the microcontroller sends a low logic signal to transistor which switches off the relay and turns on the motor pump

IV.COMPONENT USED

- Remote Controller
- Node MCU(Microcontroller)
- Power supply/Battery
- Solar Panel
- Air compressor

- Liquid fill tank
- Wheel and carrier
- Four wheeled robot

D.C Motors

A DC motor is an electrical machine that converts electrical energy into mechanical energy,Direct current which is transformed into the mechanical rotation.

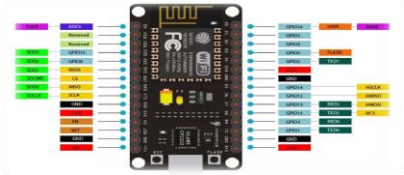
Sprinkler Nozzle

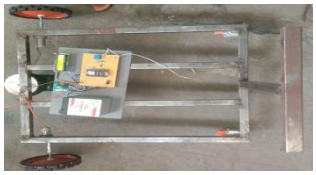
To control To control flow rate and convert the spray liquid into droplets (via atomization) that are of a suitable size for depositing on the intended target. Nozzles are frequently used to control the rate offlow, speed, direction, mass, shape, and/or thepressure of the stream.

Node MCU (Microcontroller)

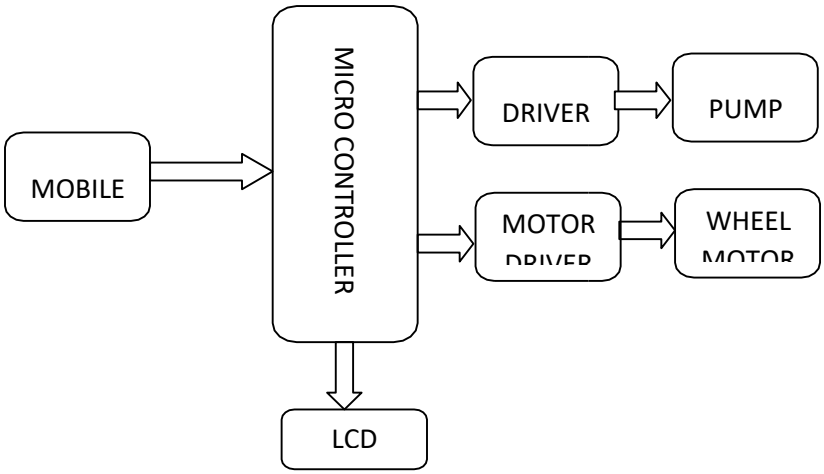
Node MCU is a microcontroller development board with Wi-Fi capability. It uses an ESP8266 microcontroller chip. Wheres Arduino UNO uses an ATMega328P microcontroller.

Memory:128kBytes
Storage:4Mbytes





V.WORKING PRINCIPLE



VI.RESULT

In this implemented system, monitoring and control of the water level in the soil is possible, switch on the motor

when the soil is dr and switch off the same motor when the soil is wet without any need for human intervention. Because of the incidence water wastage is eliminated and cut-off of water supply is equally also eliminated. The microcontroller has passed various tests with various components being interfaced to it. As described in the previous sections of the paper the controller is the heart of this project work as all the control signals are passed out processed by the micro controller.The LCD is interfaced to the microcontroller in order to display the status of the system as it operates. The LCD data port is connected to the I/O port of the microcontroller and through this port the microcontroller is able to send information or instruction codes to the LCD. The microcontroller processes the data received and used it to control algorithm stored in its ROM. The TCP client application is installed in android mobiles. Informtion is received from the field through internet of things. As per the instruction received from the field send the user send the command to the micro controller. As per the command receive the water pumped to the field to switched ON or OFF.

VII.CONCLUSION

Thus, We have come up with a low-cost plant Irrigation Water Sprinkler Robot. The project carried out by us made an impressing task in the field of Agricultural industries. It is very useful for water irrigation from streams or rivers. This project has also reduced the cost involved in the concern. Project has been designed to perform the entire requirements task, Which has also been provided.

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