

# Cow Dung Cleaning Solar Power Robot

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**Abstract**—This project helps to clear the cow dung in an automated way without the need of human. It detects the cow dung with the help of image processing and gas sensor and collect it with the help of the robotic arm. It consists of micro controlling unit which controls all the unit and process it. It could help cow sheds. Clearing the cow dung in an automated way without the need.

**Index Terms:** Microcontroller,Solar Panel,Battery, Image Processing Sensor,Gas sensor,LCD, Driver Circuit ,robotic Arm,DC Motor

## I. INTRODUCTION

Farmers have had time to keep the cow shed in today's scenario to clean the cow dung they have to spend more time or employ workers for more money. So we suggest a process in this paper which is used to clean the place. We use cow dung cleaning machine that operates under solar power. Through using this method human capital can be saved automatically.

## II. OBJECTIVE OF THE PROJECT

To Provide an alternate method to clear cow dung in the Cow Shed.This system Reduces the need of the humans in the cow shed, this robot automatically clears the cow dung. This machine is fully solar powered and it could provide luminous during night timeIt increases the automation in the Cow shed

## III. PROBLEM STATEMENT

Cow dung cleaning is the huge process in the large cow farms which consisting of large number of cattle. It need more human labor to clean the cow dung and also it take huge amount of time. The cow shed should be clean if it not clean it may use into diseases co fever cow pox exc. So the cleaning of cow shed should be properly done.

## IV. SOLUTION OF THE PROBLEM

This process cow dung cleaning solar power robot helps in cleaning the cow dung in an automated way. The robot finds the cow dung with the help of gas sensor technology/gas sensor in it. With the finding it goes the cow dung areas and cleans it automatically. When the cow dung is filled in the machine it dumps it dumping area.

## V. PROPOSED SYSTEM

The proposed system could clear the cow dung without the need of human.It could automatically detect the cow dung in the shed and clear the cow dung from the cow shed.When the cow dung is filled in the machine it automatically dump the cow dung in cow dung shed.This system uses the solar power to work.

## VI. METHODOLOGY

The Block diagram of the proposed system is shown in the Figure-1. This system detects the cow dung in the shed with the help of Image processing technology and with the help of the robotic arm it clears the cow dung n the cow shed. The gas sensor in the system also helps in detection of the cow dung in the system. This system consists of motor unit which helps for the movement of this system. The robotic arm helps to take the cow dung and fill in into it and it is taken into the shed area. The microcontroller helps in controlling the various system

connected to it such that motor units, sensing units and robotic arm unit. It is all monitored with the help of the LCD present in it.

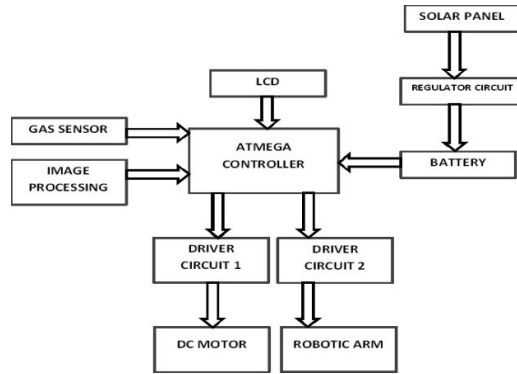


Figure-2.1. Block Diagram of proposed system

VII. FUNCTIONAL ELEMENTS OF THE SYSTEM

1. SOLAR PANEL

Colloquially, the term solar panel is used for photovoltaic (PV) module. A PV module is a photovoltaic cell assembly that is designed for framework. Photovoltaic cells use sunlight as their energy source and produce direct current. A set of PV modules is called a PV array, and an Array is an Array device. Photovoltaic network arrays provide electrical devices with solar electricity



Figure 3.1: Pictorial diagram of Solar Panel

2. BATTERY

The battery provides electricity, the cathode is the positive terminal and the anode is the negative terminal. The terminal marked negative is the source of electrons that travel to the positive terminal through an external electric circuit. When a battery is attached to an external electric charge, a redox reaction transforms high energy reactants into lower energy products, and the free energy difference is supplied as electrical energy to the external circuit. Historically, the term "battery" applied primarily to a device made up of several cells, but the use has expanded to include devices made up of a cells, but the use has expanded to include devices made up of single cell.



Figure 3.2: Pictorial diagram of Battery

### 3. LCD (LIQUID CRYSTAL DISPLAY)

A liquid crystal display (LCD) is a flat panel display or other optical system that incorporates the properties of liquid crystal light that modulates with polarizers. The liquid crystals do not emit light directly; rather, they use a backlight or reflector to create colour or monochrome images. LCDs are used to show arbitrary images (as in a general-purpose computer display) or set images with low information content that can be shown or obscured, such as the present words, digits and displays in seven parts, as in a digital clock. They use the same basic technology, except that arbitrary images are generated from a matrix of tiny pixels while other displays have larger elements. LCDs will usually be either on (positive) or off (negative), depending on the configuration of the polarizer. For example, a positive character LCD with a backlight will have black lettering on a background which is the backlight colour, and a negative character LCD will have a black background with letters of the same colour as the backlight white on is applied to the optical filters



Figure 3.3: Pictorial diagram of LCD Display

### 4. GAS SENSOR

Gas sensor may be a device that senses the presence or concentration of the atmospheric gases. The sensor generates a corresponding electrical potential depending on the concentration of the gas by adjusting the resistance of the fabric inside the sensor, which may be measured as output voltage. The sort and concentration of the gas are also calculated based on this voltage value. The type of gas that the sensor may detect depends on the inside of the sensor.



Figure 3.4: Pictorial diagram of Gas Sensor

### 5. IMAGE PROCESSING SENSOR

Sensors for the image processing are widely used today as visual sensors. The lens must photograph the target onto a matrix sensor. The camera electronics transforms the optical signal to a digital image which is then used in an assessment machine fitted with the appropriate image processing software for measuring the calculated points. Many individual components, including the lighting, the lens system, the sensor chip, the electronics and the computational algorithms, greatly influence the performance of such sensors.

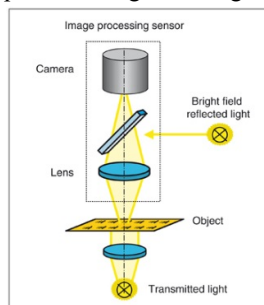


Fig 3.5: Pictorial diagram of Image processing sensor

## 6. DRIVER RELAY

We may describe a relay as a switch. Switches are normally susceptible to manually close or open the circuit. Relay is also a switch that links two circuits, or disconnects them. Yet instead of manual operation, an electrical signal relay is implemented, which links or disconnects another circuit successively. Relays include an electromagnet, and a contact group as well. The method of switching is performed with the aid of an electromagnet.

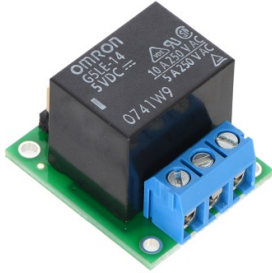


Figure 3.6: Pictorial diagram of relay

## 7. DC MOTOR

A DC motor is one of a class of rotary electric motors which converts electrical direct current into mechanical energy. The most common forms depend on magnetic-field forces. Almost all types of DC motors have some internal, electronic mechanism; to change the current direction in a part of the periodic motor.

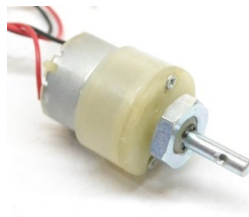


Fig 3.7: Pictorial diagram of DC motor

DC motors were the first commonly used type of motor, as they could be driven from existing direct-current distribution systems. Larger DC motors are widely used in the propulsion of electric vehicles, elevators and hoists. A wide range of DC motor speeds can be controlled either by using a variable supply voltage or by changing the current force in its field windings. The universal motor can work directly, but it is a lightweight, brushed motor used for portable power tools and appliances. Larger DC engines are typically used in electric vehicle propulsion, For elevators and steel rolling mill drives. The introduction of power electronics in many applications has made possible the replacement of DC motors with AC motors.

## 8. ROBOTIC ARM

A robotic arm (not a robotic hand) is a generally programmable type of mechanical arm with human arm-like functions; the arm may be the unit number, or it may be part of a more complicated system. Such manipulator links are connected by joints that either allow rotational movement (such as in an articulated robot) or translational (linear) movement. The manipulator's connections can be seen as forming a kinematic chain. The end effector is called the terminus of the manipulator's kinematic chain and is similar to the human side.

## 9. ATMEGA 328

The ATmega328 may be a single chip microcontroller developed by Atmel within the mega AVR family (later acquired by Atmel in 2016 by Microchip Technology) and is shown in Figure2. It has an 8bit RISC

processor core changed to Harvard architecture. It has 1 KB EEPROM memory, and 2 KB of SRAM memory.

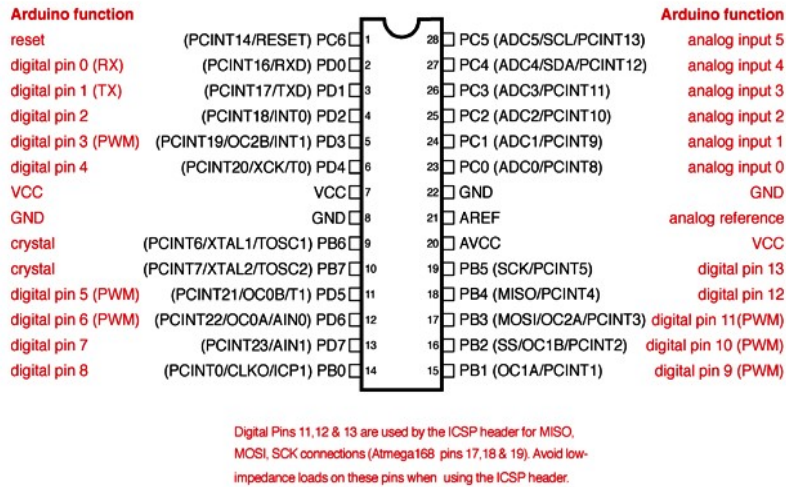


Figure-3.9: Pin diagram of Atmega328

The Atmega328 comes with 28 pins. This has 14 optical I / O pins, 6 of which are commonly used as PWM outputs and 6 analog pins. Those I / O pins cover 20 of the pins. This implies that they act as an input to the circuit or as output. Inside the program is on whether they are input or output. Fourteen of the pins are digital pins, of which six will operate to provide PWM output. 6 The pins are for input / output analogue. 2 The pins are for oscillator quartz. It is to compensate or the At mega chip with a clock pulse. For 28 pins, the Atmega328 comes. It has fourteen digital I / O pins, six of which are widely used as PWM outputs and six analog pins. Those pins I / O protect twenty pins. This means they serve as either an input to the circuit or as output. Inside the software is about whether it's input or output. Fourteen of these pins are digital pins, six of which will work to produce PWM output.

### VIII. RESULTS AND DISCUSSION

Thus with this automatic cow shed cleaning machine the cow dung in the cow shed could be cleaned automatically without the need of human and it reduces the human need in the cow shed and increases the need of automation. This machine would be suitable for the large cow sheds.

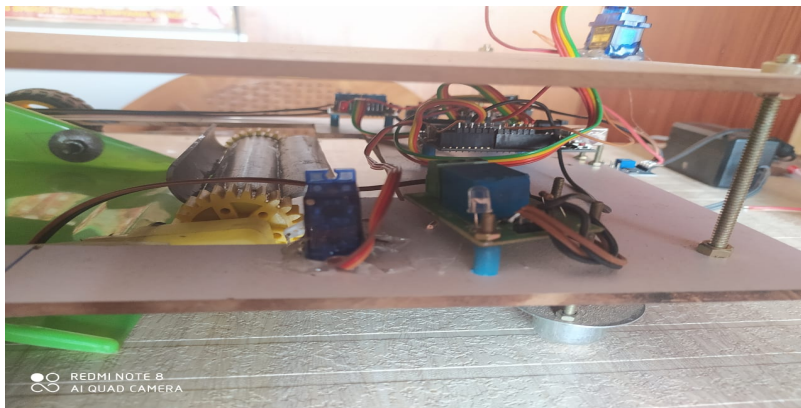


Figure 3.10: Design of cowdung cleaning machine

## IX. CONCLUSION

The design gives comfort and easy cleaning for the farmers of their cattle shed. As compared to the present day design this design has many more advantages as it helps in lifting the cow dung. It is a quick process consuming less time. And there is no consumption of fuel. This design is made by keeping view of cheaper cost for fabrication and maintenance. Environmental friendly. Providing easy and quick cleaning for the farmers is an important criterion.

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