

# Automatic Divider Painting and Pruning Robot

P. Praseetha<sup>1</sup>, A. Priscilla<sup>2</sup>, P. Prasanth<sup>3</sup>, T. Kalaikumaran<sup>4</sup>

<sup>1,2,3</sup>UG Scholar, Dept. of Computer Science and Engineering, SNS College of Technology, Coimbatore, India

<sup>4</sup>Prof. & HoD, Dept. of Computer Science and Engineering, SNS College of Technology, Coimbatore, India

**Abstract:** The primary aim of the project is to configure, create and actualize Automatic road divider painting and pruning machine which assists with accomplishing minimal effort of pruning and painting hardware. In spite of the advances in mechanical technology and its wide spreading applications, inside divider painting has shared little in investigate exercises. The work of art synthetics can make dangers to the human painters, for example, eye and respiratory framework issues. Additionally, the idea of painting method that requires rehashed work and hand rising makes it exhausting, time and exertion expending. At the point when development labourers and robots are appropriately coordinated in building errands, the entire work can be better overseen and investment funds in human work and timing are gotten as an outcome. It would offer the chance to diminish or take out human presentation to troublesome and dangerous situations and also helps to avoid traffic blockages and accidents during the work, which would tackle a large portion of the issues associated with security when numerous exercises happen simultaneously. These variables persuade the advancement of road divider painting and painting machine.

**Keywords:** Exertion, Pruning, Investigate.

## 1. Introduction

The primary aim of the project is to design, develop and implement automatic road divider painting and pruning robot which helps to achieve low cost painting equipment and safety.

Street divider may perform numerous capacities, for example, isolate the street and debilitate drivers from stopping or driving on walkways and yards. Street divider compositions advance street security and draw out the smooth guided way of movement. Street divider painting is one of the significant works in keen urban areas. The street divider painting is hand worked and led in hazardous circumstances; in this manner the significance of programmed street divider painting machine has been figured it out. The mechanization in painting began in mid-90's planning to streamline gear tasks, improve wellbeing and spare time. The regular strategy for street divider painting is time and exertion expending and causes traffic blockage because of that programmed street divider painting machine is embraced in light of the fact that just a single administrator may administer the machine and no compelling reason to convey additional hardware; right now, is helpful likewise for modest work markets.

The composition synthetic compounds can make risks the human painters, for example, eye and respiratory framework issues. Additionally then nature of painting methodology that

requires rehashed work and hand rising makes it exhausting, time and exertion expending. At the point when development laborers and machine are appropriately incorporated in building undertakings, the entire development procedure can be better overseen and investment funds in human work and timing are gotten as an outcome.

Moreover, it would offer the chance to lessen or dispose of human presentation to troublesome and unsafe conditions, which would take care of a large portion of the issues associated with wellbeing when numerous exercises happen simultaneously. These components rouse the improvement of a mechanized work of art framework.

## 2. Literature review

The essential point of the venture is to configuration, create and execute Automatic Wall Painting Robot which assists with accomplishing minimal effort painting hardware. In spite of the advances in mechanical autonomy and its wide spreading applications, inside divider painting has shared little in inquire about exercises. The canvas synthetic compounds can make risks the human painters, for example, eye and respiratory framework issues. Additionally, the idea of painting system that requires rehashed work and hand rising makes it exhausting, time and exertion expending.

The objective is to automate the spray painting procedure of pump casings that is mass-produced in industries. At present two laborers work in a solitary paint corner, one for taking care of the segment while the other specialist paints the part. Right now, siphon housings are barrel shaped segments which are painted while being pivoted by a three stage acceptance engine. A pneumatic chamber is utilized to lift the paint firearm with the goal that the paint is applied to the whole stature of the siphon packaging. The paint weapon is incited by another pneumatic chamber. The procedure is constrained by ATmega16 microcontroller. A sensor set at the highest point of the paint firearm is utilized to identify if the siphon packaging is put or not and to recognize the maximum furthest reaches of the siphon packaging with the goal that the splash can be halted when the paint weapon arrives at the highest point of the siphon packaging. The pneumatic chambers are controlled utilizing two electro-pneumatic solenoid valves, one for augmentation and the other for withdrawal. At the point when the siphon packaging is set, the paint shower begins and the paint firearm is lifted. At the point when the paint weapon has arrived at the

necessary stature, the splash stops and the paint firearm is brought down. At last the siphon packaging is taken out. The paint shower framework that can paint a tube shaped part with a most extreme tallness of 30 cm and greatest width of 20 cm. A laborer is required uniquely to deal with the segment, along these lines decreasing the quantity of laborers per paint corner by one and furthermore the time taken for painting is diminished. direct cutting edges are joined right now. Working rule of this robot shaper is giving a fast turn to the sharp edge, which assists with cutting the grass. The sharp edge will get motor vitality while expanding the rpm. The front lines are extremely smooth and precise. With the assistance of a grass cutter which is a machine with spinning sharp edges to help us cutting yards at even length, individuals can undoubtedly keep up and decorate their yards and nurseries with no bother.

### 3. Existing system

In manual painting, the paint consists of the risks causing hassle to the painters such as eye and respiration device issues and additionally the nature of painting procedure that requires repeated work and hand growing makes it boring, time and effort eating. This process takes more value, extended paintings force for human workers and growth in time intake. Manual painting has been a hassle for road contractors, as there may be a big monetary investment in labour wages, time, fabric and money. In addition to that cutting and cleaning of the street earlier than painting the divider is guide. This system is much complicated, gradual effects and no assurance of correct portray. The main problem within the conventional method is it consists of the traffic jam, repetitive paintings, time-consuming and greater efforts are required and also conducted in a risky situation. If this problem isn't solved this would be continued as it is.

For example: To paint 700m span of divider manually an approximate of 6 hrs is needed that too for a single color & the identical repeats for the second one (12 hrs).At first this operation requires three labours are required for marking cause. Followed by using 2 labours to finish the span. This requires numbers of brushes & rollers.

### 4. Proposed system

The aim of the project is to develop a robot which replaces the human in painting the divider in the road and also helps in cleaning and pruning the plants in the side of the road. To develop a "Automatic Divider Painting and Pruning Robot". The robot initially cleans the surface of the road and starts painting. First the robotics filled with the paint in the container. The robot paints the divider of one-meter length and leaves a gap of half a meter and starts painting again. It also prunes the plants grown at the sides of the road. Firstly, the chassis is programmed to control the operation. The chassis has four DC motor and below that it has wheels to move. The chassis has the ultrasonic sensor that detects and prunes the plants in the corners of the road using the blades fixed by the controller and

it is performed using the DC motor. Secondly, there is a parallel process that contains server that performs the colouring operation. The server is controlled by the lock pressure. If the lock pressure is ON, the painting starts and stops when the lock pressure is OFF. When the DC motor is ON the chassis moves and does the operation of pruning and painting. The chassis moves certain distance and paints the particular colour as programmed. The advantages of "Automatic Divider Painting and Pruning Robot" is that it is simple in construction, automatic system and does not required skilled labour. It will reduce the time for painting work and avoid issues due to the painting spraying to human health. This divider painting machine would reduce human efforts would give a smooth and constant paint thickness and reduce paint usage.

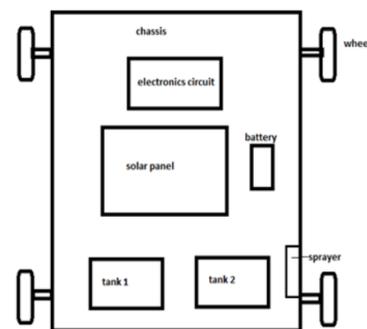


Fig 1. Divider painting machine

The diagram of the divider painting and pruning robot machine for smart cities is shown in the above figure 1. This consists of various parts such as DC motor, mini compressor, Arduino Uno board, chassis, servo motor and batteries.

#### A. Battery

The battery is used in this project in order to provide supply to the chassis and motors. The zinc-carbon battery use constant current voltage charge method [11]. A regulated current raises the terminal voltage until the upper charge voltage limit is reached at which point current drops due to saturation.

#### B. Compressor

A compressor is a device that converts power into potential energy stored in pressurized air (i.e., compressed air). In order to increase the pressure more and more air is stored in the storage tank. Air compressor used is of 300PSI, 12v dc rating.

#### C. DC Motor

DC Motor converts electric energy into mechanical energy. A DC motor uses direct current in other words, the direction of current flows in one direction. DC motor is used because of ease of controlling speed and direction [6]. They are capable of the infinite speed rang, form full speed to zero, with a wide range of loads. Because DC motors has a high torque to inertia ratio, they can respond quickly to changes in control signals. A DC motor can be smoothly controlled to zero motion and instantly accelerated in the opposite direction without the need for

complex power switching circuitry. These motors are inexpensive, lightweight and reasonably efficient.

#### *D. Servo Motor*

A servo motor is an electrical device which can push or rotate an object with great precision. If you want to rotate an object at some specific angles or distance, then you use servo motor. It is just made up of simple motor which run through servo mechanism. If motor is used is DC powered, then it is called DC servo motor.

### **5. Conclusion**

The automatic painting machine for road dividers and plant cutting machine is design and implemented successfully. The machine paints the divider in minimum time, with less efforts and minimum cost. The problem of traffic congestion and exposure of labours to hazardous paint is eliminated. This also

helps in cutting and clearing the plants in the roadside easily. The robot eliminates the hazards caused due to the painting chemicals to the human painters such as eye and respiratory system problems and also the nature of painting procedure that requires repeated work and hand rising makes it boring, time and effort consuming. The robot is cost effective, reduces work force for human workers, reduces time consumption. The automatic painting machine for road dividers is design and implemented successfully. The machine paints the divider in minimum time, with less efforts and minimum cost. The problem of traffic congestion is eliminated.

### **References**

- [1] Shin K. G., "Design and Development of a Solar Powered Lawn Mower," International Journal of Scientific & Engineering Research, Volume 5, Issue 6, 2018.