JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue

JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

DESIGN AND DEVELOPMMENT OF THREE STAGE INDUSTRIAL CAR WASHING SYSTEM

Dr.P.G.GOPINATH, K.GUNA SEKHAR, S.CHANDANA, G.AKHIL GOWD, R.CHENCHU KEERTHI, M.EKSHITHA

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONS ENGINEERING

SIDDHARTH INSTITUTE OF ENGINEERING AND TECHNOLOGY

ABSTRACT

Car wash systems enable fully automated car washes to be completed in a short period of time. In this video, we show how a smart vehicle wash system can totally automate the automobile cleaning process. A three-stage car wash system is included in the system. At the beginning, there is an additional step that acts as an ID verification for the customer. We use RFID for the verification process in this case. The system is made up of a miniature conveyor belt that attaches to an automobile. An infrared sensor is used to determine whether a car has been parked in the system. Following identification, the system initiates belt movement using a motorised system, and the vehicle advances to the first step, when it begins washing the automobile for a period of time. After some amount of time car will come out.

Keywords: Car Washing, Conveyor belt, DC motor, Water pumping, Dryer.

I INTRODUCTION

Car washing is a single task performed to maintain the car's exterior clean. The majority of it is done manually in locomotive garages, resulting in further loss of water, labour, and time. The automatic car washing system reduces the use of water as well as the demand for people. ARDUINO is used to control our car washing system. Foaming, washing, and drying are the three processes that our vehicle washer system goes through. Washing cycles involve a detergent wash followed by a water wash. ARDUINO is a microcontroller that can easily control most machinery. In ARDUINO, installing and configuring an application is a breeze. Before releasing a programme developed in C, it can be authenticated and checked. The programmes produced in C may be authenticated and checked before final installation, and they can also be modified at any time without disrupting the project's physical apparatus. The nicest feature of using ARDUINO is that it doesn't require any traditional wiring or rewiring if the previously installed application is changed. ARDUINO primarily performs three functions that are repeatedly performed in the same order. (1) Input testing (2) programme execution (3) output updating are the three basic functions. In ARDUINO, input terminals are provided for connecting input devices, while output terminals are provided for connecting output devices. It already exists, which is why we are include RFID in our project.

II LITERATURE SURVEY

[1] RFID-GSM Autonomous Car Washing System

Demonstrated how to process the functioning of an automatic car washer using a microcontroller. It discusses the use of various infrared sensors, RFID, and GSM technology. A conveyer mechanism is utilised to move the vehicle from the entry point to the workplace. The position of a dirty surface of a car is tracked by a dust particle detecting sensor. The vehicle is washed with a sprinkler and a drying device. RFID-GSM technology will be employed, with RFID preventing incorrect vehicle detection and GSM informing customers about vehicle washing status.

[2] Intelligent Automatic Car Washing System

Vehicle cleaning is an important part of preventive maintenance. Keeping the outside of a vehicle clean helps to prevent rust and oxidation, as well as fine scratches. The purpose of this paper is to advance the most widely known procedure and the relevance of this relaxing activity forward. This project is based on a microcontroller. In 1940, the first transportation-based vehicle wash opened in the United States. This structure is employed in the system of pulling. This was the replacement of pushing today's current scientific inclinations, which enabled the improved vehicle washing system to accomplish spectacular and capabilities. The AT89S52 Microcontroller is a fantastic microprocessor. For some embedded control applications, it provides an extremely adaptable and cost-effective response. This is a very common technique in developed countries. The AT89S52 has a static manner of reasoning for action down to zero repeat, as well as programming configurable power-saving options. The CPU is turned off in Ideal Mode, while the RAM, clocks/counters, consecutive port, and tamper with structure continue to function.

[3] Automatic Car Washing using PLC

PLC-based automatic vehicle washing is explained. PLC stands for programmable logic controller, which is a sort of microcontroller that allows an automobile to enter a washing center and be washed automatically. Conveyor belts, sensors, DC motors, brushes, and dryers are among the system's components. PLC controls all of these components. The washing of a vehicle uses about 35 gallons of water. Washing a vehicle also causes micro scratches, which can be avoided with this method. The project's major components are a connected PLC and SMPS. The SMPS (Switch Mode Power Supply) is a device that efficiently converts electrical power. SMPS is a device that transfers power from a primary power source. This energy is now channeled through a PLC, which is a digital computer used in factories for routine tasks.

[4] PLC Based Car Washing System

The usage of a PLC (programmable logic controller) for processing the operation of an automatic vehicle washer is detailed in PLC based car washing system. Programmable controller is another name for PLC (Programmable Logic Controller). It is a computerised, industrial computer station in a robust state. It consists of massive equipment with robotic brushes that are operated by project-approved controllers. With numerous phases of frothing, washing, drying, and brushing, the programmed auto washing framework is totally robotized. The PLC understands what to do as a result of a project that was designed and then stored in its memory. One of the best robotized gadgets is the programmable reasoning controller, which is specifically employed to work the specific framework specified.

[5] Design of a Drying System for a rollover Carwash Machine Using CFD

CFD was used to explain a drying mechanism for a rollover carwash machine. On the basis of airflow-induced shear stress, a model for the separation of water droplets on solid surfaces is proposed. A pair of stationary vertical dryers and a moving horizontal dryer that can conform to the curve of a vehicle make up this system. Schleeter offered one of the key design patents for a rollover carwash, which is a portable device consisting of an upright U-shaped system. The moving frame is first moved in one direction to wash the vehicle's body, then in the other direction to dry it. The current rollover car washing machines use a drying system that is made up of two fixed vertical dryers.

[6] Automatic Car Washing and Drying System

The usage of an electro-mechanical system to control an automatic vehicle washer is explained in the Automatic Car Washing and Drying System. Lifting parallel autos and moving forward is part of the automatic car washer's process. The vehicles are then washed, first with foam water, then with soap water, and finally with clean water. Finally, the vehicle is lifted and repositioned parallel to the ground. Mechanical assembly and electrical control are the two main sections of the system. It emphasises the use of a PLC to control a vehicle washing.

[7] Design and Implementation of Automatic Car Washing System using PLC

Automatic Car Washing is a project that uses a PLC. The first automobile washing system, which used a conveyor, was established in the United States in 1940. This system includes a hoist system that was previously employed in a pull system. This was the replacement of pushing to achieve high dependability and efficiency in the automatic car washing system, thanks to today's advances in science. PLC is a type of automation that is extremely crucial. In industrialised countries, this type of conveyer system is fairly common. However, there is a disadvantage to the conveyer procedure in that we are unable to clean the car's backside. The pressure cylinder is being used to raise the car so that we may clean the car's underneath in our Project. Our approach is built on a cyclic process that generates results.

III PROPOSED SYSTEM

In this the conveyor belt will rotate continuously, here we are using IR Sensors are used to detect the car in every stage. When the car enters to the 1st stage then the conveyor belt moves and stops and starts washing the car for some time and the conveyor starts moving again and again sensor detects which means 2nd stage of washing car there the soft brushes are used to clean the cars for some time and after that again the belt moves and in 3rd stage fan will ON and make the car dry for some time and stops and starts the conveyor belt so that the car went out of the cleaning place. Likewise, car is cleaned so that it is easy to make a car to clean without humans and in less time.

The vehicle is moved to the vehicle line in a vehicle washing system, and a closeness sensor detects the vehicle's vicinity. As shown in the flow chart, when the vehicle is detected, the sensor sends a signal to the PLC, and the vehicle line comes to a halt. Following this, the vehicle must be washed with water, and the solenoid valve must be opened, as well as water being sprayed on the vehicle. After washing the car with water, it must be rinsed with foam to eliminate all filth and buildup, which necessitates the opening of another solenoid valve.

When the car is washed with foam, it is washed again with water to remove the foam, causing the water solenoid valve to open. After the vehicle has been washed, it is pulled forward to be cleaned with blinds. The closeness sensor detects that the car is set up, and the brushes are used to clean the vehicle from now on. The final phase of the car washing structure is drying the vehicle, for which the vehicle is driven forward and the drier is turned on when the region sensor detects the vehicle set up. The vehicle is driven forward once more before being removed from the vehicle line.

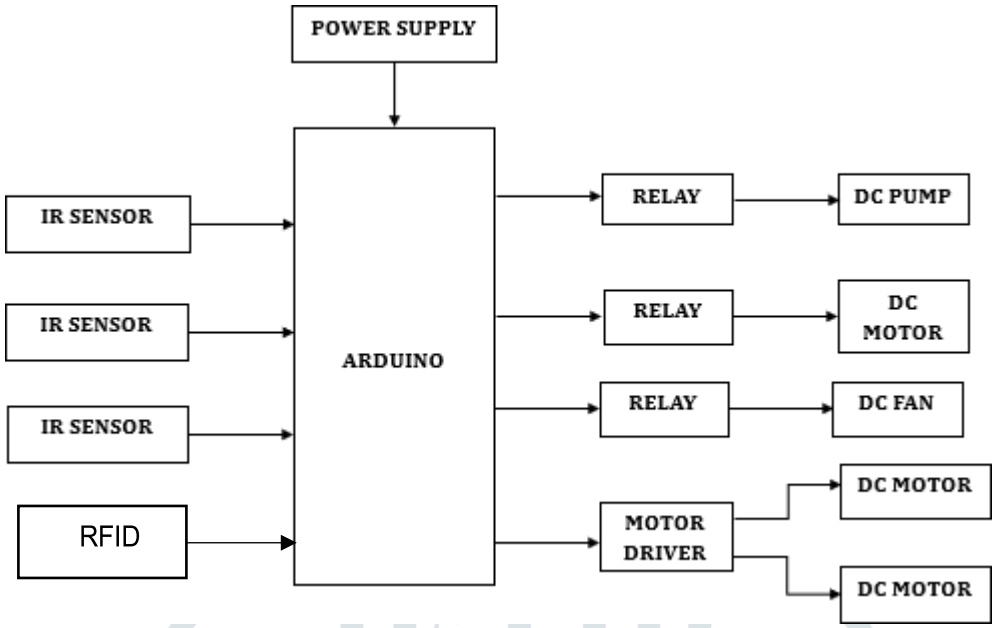

Figure: 3. Block Diagram

IV EXPERIMENTAL RESULTS

Execution Procedure:

1. First make sure all connections are good.
2. In first stage driver allowed after the verification by RFID.
3. After that main procedure will start.
4. First stage, in this stage car will wash by hot water and foam.
5. Second stage, this stage will activate after the first stage.
6. In second stage car will be washed by brushes.
7. Third stage, it is the final stage.
8. In this stage car will be dried by using fans.
9. After all these three stages car will come out as new.

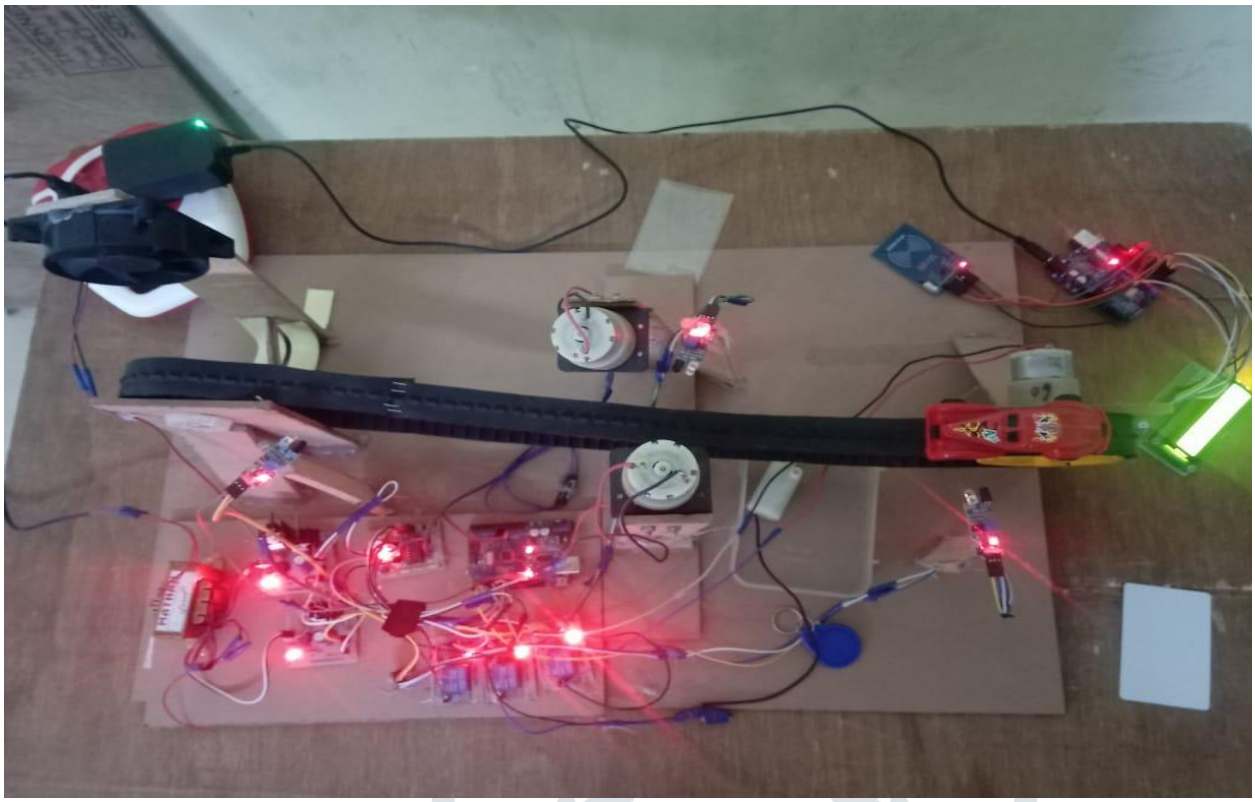

Figure: 4. Automatic Car Washing System

V CONCLUSION

This prototype will help to perform car washing automatically results in high quality end product. Thus it will be User-friendly and capable to wash multiple cars at a time. Also require less man power, time and no pollution. This project covers the majority of the ground, allowing it to provide an all-encompassing Shrewd Automatic Car Washing System. The demand for Intelligent Automatic Car Wash Services is increasing, and people are eager to wash their vehicles at a location where their paint will not be damaged. In addition, a dominating wash is applied. Furthermore, a remarkable feature is that people can save time because this vehicle wash takes less time and the vehicle is also dried. As a result, many potential clients holding on for such firms should be familiar with this new Intelligent Automatic Car Washing Service.

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