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AUTOMATIC CAR WASHING SYSTEM

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ABSTRACT

This Paper present work an Automatic car washing using a PLC based paper. A PLC is a programmable logical controller which is a type of microcontroller. The automatic car washing using conveyer belt system is already in market. In our project we are using pressure cylinder to lift the car. Our project is prototype in which a car enters a washing station and automatically gets clean up. We are using various components in this project such as pressure cylinder, dc motor, brushes and dryer. This entire component is controlled using PLC. The main aim of our project is use less water, more efficient washing. Practically at home we use 150 gallons of water but using this process 35 gallons of water gets used up. By using this process we can clean up the car up to 95

***Keywords*: -** *Pressure, Dryer, Washing*

I. INTRODUCTION

Automatic Car Washing is a PLC based project. The first car wash using conveyer was opened in USA in 1940. This system has winch system which was used in pulling system. This was the replacement of pushing now days latest advantages in science have made it possible to achieve great reliability and efficiency in the automatic car washing system. PLC plays a very important role in the system which is used for automation. This conveyer process is very common in developed countries. But in the conveyer process we cannot clean up the downside of the car. In our project we are using the pressure cylinder to lift the car so we can clean the downside of the car. Our project is based on cyclic process which provides more than 95.

Positives of using PLC

A PLC is a controller which can control most of the machines very easily. Installing a program and setting it up is very easy in a PLC. The programs written in ladder language can be verified and checked before final installation and also it can be edited at any time without disturbing any physical setup of the project. The best part of using a PLC is that it does not require any typical wiring and rewiring if some changes are made in the previously installed program.

II. METHODOLOGY

The working of the car washing system is when the car is entered in the washing room the car is placed on the small conveyer. The dc motor used in conveyer belt system. The solenoid valve is used to provide the detergent

water to clean the car. This conveyer takes car to the lift mechanism. Lift mechanism lift the car upside where the brushing system and sprinkler system is used. Brushing system is used to clean the car and the sprinkler system is used to wash the car using

COMPONENT

Various types of components are used in this project:

1.1 Proximity sensor

A proximity sensor is a detects the presence of nearby objects without any physical contacts by emitting electromagnetic field or a beam of electromagnetic radiation. In our project, we have used inductive type proximity sensor for detection of metal cars.

1.2 PLC

PLC is a specialized computer used for the control and operation of manufacturing process and machinery. It uses a programmable memory to store instructions and execute functions including on/off control, timing, counting, sequencing, arithmetic, and data handling.

1.3 Conveyor belt

A conveyor system is a common piece of mechanical handling equipment. That moves materials from one location to another. Conveyors are especially useful in applications involving the transportation of heavy or bulky materials. Conveyor systems allow quick and efficient transportation for a wide variety of materials.

1.4 Solenoid valve

It is an electronically operated device. For our requirements, the two port solenoid valve is the most suitable one. It is generally used to replace a manual valve.

1.5 Motor

In a dc motor, armature rotates inside a magnetic field. The basic principle of DC motor is that whenever a current carrying conductor is placed inside a magnetic field, there will be mechanical forces experienced by the conductor. Generally all dc motors work on same principle. In our project, we are going to use 24 V DC relay. We are going to use two dc motors for moving the conveyer belt.

1.6 Pressure cylinder

Pressure cylinder is mechanical devices which use the power of compressed gas to produce a force in a reciprocating linear motion. Like hydraulic cylinders, something forces a piston to move in the desired direction.

2.PLC operation

A programmable logic controller performs mainly three functions which are continuously repeated in a proper sequence. The three main functions are (1) Testing the input; (2) Execution of the program; (3) Updating the output. In a PLC there is a provision of input terminals for connecting the input devices and output terminals for

connecting the output devices. In this research the metallic sensor used can be kept in the category of input devices and the motors or relays can be kept in the category of output devices. The most important function of a PLC is scanning the program continuously and this manipulation of program is continued using the above mentioned three main functions of a PLC. In PLCs, the operations are performed according to the input status and for all the possible inputs a set of commands are already stored in the memory of PLC such that for x0 input correspondingly y0 output will be given and this process further carried forward in a similar manner.

III. EXPERIMENTATION

In rainy season the downside of the car was get corrode by mud. In the conveyer belt process we cannot clean the downside of the car. So in this project we are using the pressure cylinder to lift the car so we can clean the downside of the car. The figure 1 shows the block diagram of automatic car washing system and each activity is carried out for certain time period. Water is sprayed for 15sec and pump is stopped by PLC command. Then two brushes rotate and side by side soap water is also sprayed on the car for 10 sec and stops. Now the conveyor starts moving to next stage. In the next stage car is lifted by pressure cylinder where downside of the car is being cleaned. After few sec, it stops for drying. A fan is used for drying the car up to 30sec

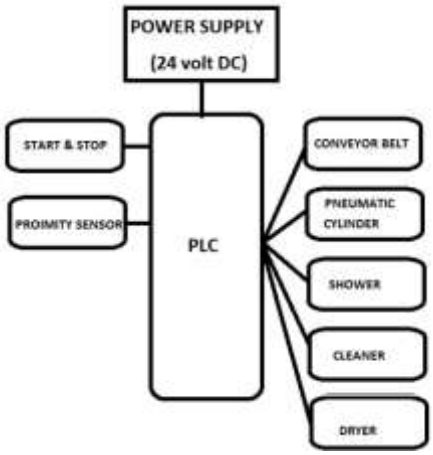

Fig. 1.Block diagram of Automatic car washing system

IV. RESULT ANALYSIS

In Automatic Car Washing System, we performed all the operations needed to clean the car successfully by using PLC after completion of the above processes by installation of this system car washing will be cost effective, time saving and pollution free. By using this process we can clean up the car up to 95.

1. Advantages

1. Reduce man power.
2. Proper utilization of foam and water.

3. The system is easy to operate.

4. It reduces the time of washing process.

5. Downside of the car gets cleaned.

2. **Disadvantages**

1. Primary cost is high.

2. Use of chemical shampoos are very harmful in this process.

V. CONCLUSION

Putting all discussions together, one can conclude that the proposed method for controlling automatic car wash removes restrictions that exist on common systems and introduces a unique way to create error-free and highly efficient project. This prototype will help to perform car washing automatically and results in high quality end product. It requires less man power, time and no pollution.

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