

FABRICATION OF AUTOMATIC WINDOW CLEANING MECHANISM

ABSTRACT

The rapid growth of advanced robots has given researchers unprecedented opportunities to explore and discover new fields of research where robots can be used to assist humans in their daily life. There are many applications that use robots and automation in different aspects of life such as industry, medical, domestic machines and etc. In this paper, the work has been devoted for the use of robotics and robots in cleaning process. The window cleaning robot is one of the robots that have emerged in recent decay. This robot can be used in homes, offices and large buildings. The main target is to design a robot that can clean glass windows efficiently and rapidly even in dangerous and hazardous places. The robot will be controlled using the Programmable Logic Controller PLC. The motion will generated by three servo motors.

INTRODUCTION

Robots have been created to assist or replace humans in various dangerous and difficult tasks. Robots have been used in construction, manufacturing, security and etc. This is because they are able to adapt to different environments and situations. They have conquered nearly all environments that humans have put them through. Cleanliness is one of the important aspects in human life. Our prophet (SAW) said that the cleanliness is part of our faith. Because of the importance, many kind of cleaning mechanisms are invented to ease the human daily chores such as vacuum cleaners, window cleaners which are to clean glass windows. Nowadays, with the

large increase in development of tall and smart buildings in urban areas, the window cleaning robot become a necessity.

DESCRIPTION

The industrial robot is considered to be a mechanical devices which can carry out the human jobs in dangerous and hazard areas. This is to stop danger on the human's life. Moreover, robots can repeat the job task more frequently with precision and shorter time. The window cleaning robot is operated by itself which will not require an operator. In this new millennium, technology has been developing rapidly and every day, new invention appeared in order to make human life easier. The window cleaning robot itself is in evolution to make it intelligent and move by itself without man to operate it. Some of those robots had been already produced. They are intelligent and autonomous cleaner with different features. To make the robot move by itself, we have to fix a system which could drive the robot to move. By integrating the wiping mechanism with mobile robot, we will have our own automatic cleaning robot which can move by itself intelligently while we are reading our daily newspaper. Besides having our smart cleaner moving by itself, we also want our cleaner to be smart enough to differentiate the capacity of the dirt so that it can use lower energy for not-so-dirty surfaces and more energy for heavy dirt. By this, we will not only save the human energy and time but saving the electricity and cost for the bill too. This will avoid waste of energy and money while the dirt will be cleaned as we wish. The robot not only moving by itself, and smart to differentiate the dirt, it is also required to clean the dirt properly and in various surface conditions. This will benefit in cleaning the dirt properly and saving the energy. By these three important aspects, what else we want our cleaner to be? We will have a smart, energy-saving, cost-saving, environment-friendly and human friendly cleaner we ever had. The advantages of the window cleaning robot which is shown, can be summarized as follows: - no danger for human life. - precision in work. - fast cleaning. - repealing the cleaning process in some cases.

CONCLUSIONS

The automatic window cleaning robot has been successfully designed and fabricated. The components used in this work are simple and cheap. The software programming is simple and can be modified and implemented easily. In general the system works adequately as anticipated in the design process. The cleaning process takes about (2.5) minutes to finish a 1 m² glass window. This time depends on the speeds of the motors and the degree of dirtiness of the window. Finally, this system should be further developed so that it will have more features.