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Design and Development of Wall Tile Washing Semi-Automatic Machine

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Abstract: ***Washing and cleaning of tiles is essential job of buildings, restaurants, rooms. Home appliances of today are getting smarter and have higher degrees of automation. Home automation provides comfort for individuals and generates more time. This project aims to design and build robotic washing system for wall tiles Floor tiles are simple to clean and many machine systems and papers in this field are written. But the vertical wall tile scan only be manually washed. Unique equipment is not available. In that reason more time is spent. Robotics vacuum systems are easily available to use only for dust cleaning, so there is a huge demand in vertical position for developing such a tiles washing machine. This machine is designed to make the process of cleaning simpler than manual floor cleaning equipment, which also makes use of wall tiles cleaning. The principle developed involves a lifting mechanism to run over a wall and a rotation. In the front, a rotating scrubber device for cleaning a wall surface. This paper introduces the design and creation of a robotic device for vertical wall tile washing. Firstly, during upward movement of the lift system, the system sprays detergent solution to mop on the surface to remove dirty particles & water spray to clean the surface during downward movement.***
Keywords: Robotic Wall Tile system, machinery, washing equipment

I. INTRODUCTION

Indoor cleaning is a daunting practical and theoretical challenge, the fundamental solution to which lies in the field of research in robotics and science. With realistic and economical solutions, washing robots are the first member of the family of service robots to gain consumer value. The scrubbing of household tiles is a repeated activity that people carry out every day Hence,there is an essential need to change science and technologies, which helps us in repetitive work which we perform daily. In different public service industries tile sanitizing work should be irritative and more hectic because regular cleaniness is required henceforth peoples not interested to invest more time on wall tile scrubbing my hands Instead of this people are interested in electro-mechanical machines where, in less time, they can do wall tile up. Electric-powered floor cleaner system was first developed in the 1900s in the field of sanitizing floor surface, at the same time vacuum cleaners came in. The first floor trying to elevate machines were known as a divided weight machine in which the weight of the machine was on its rear wheel which stood on the floor through operation, and the buffer rolled over the floor to make a scrubbing action.

The weight of the machine subsequently decreases to some level and the rotational speed of the scrubber stays at 750 to 1000 rpm such a computer may not use this specification to clean the wall. Much of the research was done for floor scrubbing and a lot of manual equipment was designed for floor washing, as no work was done to date in the development of the wall sanitizing device, so people used manual equipment to clean the surface of the wall tile. Linked to surface cleaning in the last year robotics cleaners take Cleaners have paid a great deal of attention to the field of robotics science. In essence, robots cleaners are characterized by their abilities in cleaning such as floor mopping, dry vacuum cleaning & climbing technologies, etc. It's a first floor cleaner robot named Roomba in 2002 recently introduced by Robots. A number of Roomba, Scooba and Brava robots have been developed because of their market demand launched These robots were fed with technologies such as infrared sensors, mechanism for auto charging, detection of obstacles. These robots are not compliant with wall sanitization in any of these situations.

II. METHODOLOGIES

A. Design Selection

It is the method of choosing the term that has been tested according to the specification and the relevant criteria. Choose the correct description to be used for analysis when evaluating the relative strengths and weaknesses of the model. Ideal option is the method of narrowing down the alternative definition. For the final design for this device, the screening type was selected. This approach allows designers to recognize which idea is better suited

B. Conceptual Design

1) Design: This is the rough design**.** This design shows the most practical work to apply. Sufficient force for the rising surface and work of an automation. Vertical frame structure is automatic system that should ensure minimum human intervention only for ON/OFF the system and operation selection. So that operator ensures the safety to avoid the body contact with the cleaning agent and steam. It can easily handle by a worker and reduce extra effort. Previous design contains some problems like manual work mode. Lifting issue, mechanism was not feasible and practical. So we reach to work ahead on this type of design.

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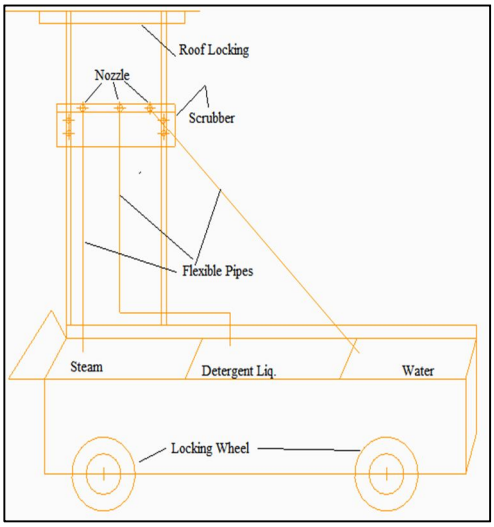
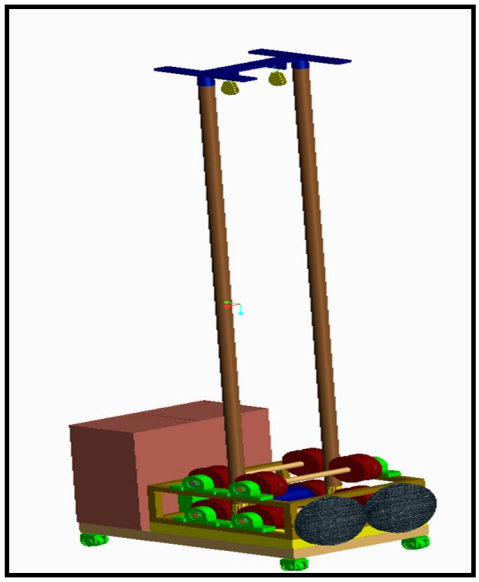


Basic Design Principle for Wall Tile Washing Robotic System

This robotic system is a special system for successful short time scrubbing of wall tiles. The solution tank tub, support rod, lift frame drive-by D.C. are also included in the system engine. This is raised by a device of wire rope and worm gear on which the scrubber is mounted and separately rotated by the drive motor. The machine can drive in automatic as well as semiautomatic modes. The lift frame is initially at the bottom floor, and the mechanism starts to lift upward. The wire rope is wrapped in one direction on a drum and other wire rope ends are connected. To wash the surface of the tiles, the scrubber starts spinning and detergent solution is sprayed on the surface. Likewise, the wire rope wound on the drum moves downward in the reverse direction to create the lift frame. During this water reverse direction is pumped to clean the surface.



Assembled 3D View of Automated Wall Tile Cleaning System

C. Advantages of Automatic Wall Tile Cleaning System

1) This system is used efficiently for the cleaning of bathroom wall tiles, outer house wall, corridor, hotel kitchens.
2) Improving efficiency
3) Easy, portable, and easy to transfer.
4) Reduce precious time and resources and manual hard work.

III. RESULT

The wall tile cleaning robotic device design and implementation has been completed. Initially, we carried out the activity of the system in the step wise creation of the system for the trial purpose of component protection. When the lift frame sub-assembly with the complete components is ready, we initially run the system in open space to verify if the system is moving in Traveling in the up position and testing the design we initially execute is secure or not.

IV. CONCLUSION

This semi-automated wall tile cleaning device configuration can be used to clean tiles of any kind on the wall. The automated wall tile cleaning device built will clean the 6 sq. wall surface. Foot zone in one minute. As a lifting frame, a motor which is suitable for cleaning tiles in a short period of time travels a distance of 471 mm per minute at 120 rpm. In less time , it provides quality finished cleaning, improved protection, efficiency, and saved labor wages. It is also easy for unskilled operators to run, easy to clean and maintain, The most successful cleaning results are the use of scrubbing equipment and, water suction. The machine applies consistent force for surface cleaning along a wall that is more convenient than a human being. This device provides the user with protection during the rinsing process to prevent falling, tripping and body contact with cleaning agents.

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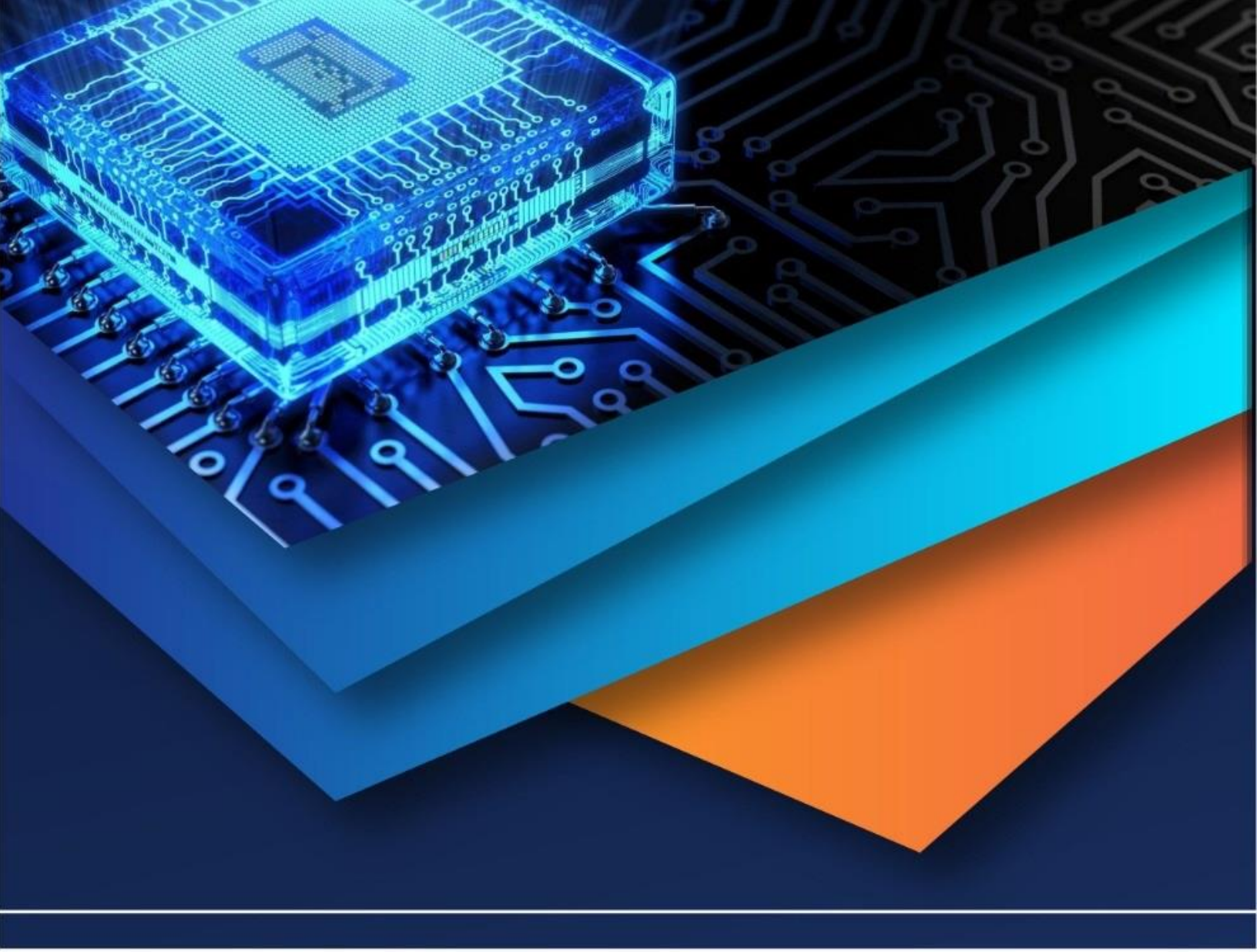

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