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SPIDER WIPER

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Abstract: Cleaning and washing glass walls of the sky scrapers is too risky. It may lead to accidents and furthermore disasters. For security and easiness of cleaning the glass walls The overall control will be given by the user through an android application. Bluetooth model is used as communication device here.

Keywords— ***Glass cleaning, skyscrapers, Bluetooth control.***

I. INTRODUCTION

At present, there are a large number of high rise buildings with the glass curtain walls in modern cities. This is presently cleaned out using traditional gondola systems. In the developing world ,every field is getting updated by technologies which reduces labor's time. In this proposed design the Spider wiper eliminates risk in the way of cleaning. We have improved the method by using the Arduino processor which commands the cleaner and sprayer according to prefixed time intervals. The movement of the setup is initiated with the introductory movement of motor which simulates the locomotion of the setup there by performing the cleaning process.

II. LITERATURE SURVEY

"JiujinZhen and Zhonghua Zhao", in 2012 has discovered, "Study of Pneumatic Glass-Wall Cleaning Robots" describes that Through the analysis of glass-wall cleaning robots research status at home and abroad, based on cleaning characteristics and requirements of such kind of smooth surface, a kind of pneumatic glass-wall cleaning robot is presented here. The robot which adopts unique three-position cylinder driving technique and embedded control system can crawl along the glass-wall and clean, and can overcome obstacles in a certain height. Running results show that the robot system has simple structure, low cost, the functions of on-line fault diagnosis, and can provide a new efficient, simple and safe way for the glass-wall cleaning. Based on the characteristics of the high finish of high-rise building glass-walls, according to the request of continuous wide range cleaning operation, a full pneumatic-driven and vacuum adhesion cleaning robot program is presented.

"TusharAnand, Sunny Kumar Kushwaha, S. EmaldaRoslin, N.M. Nandhitha" has discovered "Flux Controlled BLDC Motor for Automated Glass Cleaning Robot". The idea is to use the principle of negative thrust-pressure to create vacuum under the robot using air blowers. The developed model promise less weight compared to the other models present in the literature. The idea is to use the principle of negative thrust-pressure to create vacuum under the robot using Air Blowers with inverted propellers. The Wiper will be mounted at the rear of the robot at zero level which can be used dry as well as wet with a Glass friendly solution. The

motion of the robot will accordingly help in the motion of the wiper and the objective is therefore achieved. There are four gear motors to provide a torque efficient enough to spin the wheels on the vertical surface . There is a wiper attached at the rear of the wheel which helps in cleaning. The wiper can used both dry as well as wet according to the needs of the user. The proposed method can work well for wall and glass cleaning purposes with less weight and low cost. Also the proposed design can greatly reduce the human risk involved in cleaning tall buildings.

"HouxiangZhg, Jianwei Zhang, Rong Liu, and GuanghuaZong" has developed, "A Novel Approach to Pneumatic Position Servo Control of a Glass Wall Cleaning Robot". This implies that the method can meet the requirements of realization. The robotic system consists of three parts: 1) a following unit; 2) a supporting vehicle; 3) the cleaning robot. The robot is being supported above by cable following unit mounted on the top of the building. A hose for water, a trachea for pressured air, cables for power and control signals are provided.

III EXISTING SYSTEM

"DănuţPavel TOCUŢ" has developed "Design of Cleaning Robot System to External Glass Walls of Buildings". The climbing robot is designated at service , which are more used in cleaning-washing services of frontage buildings with glass walls. The system are made up of mechanical function with light source formed by vaccum systems and command moving in conformity with predictable software. At design of 3D model was used Solid Works which allows the users to define and organize multiple structures of assembly. This design is applicable for the better productivity, drawing of parts that assured for user multiple advantages, An attitude from up to down (from assemble to part) and from down to up (from part to assemble) of assembly design, the assembled part location of the advanced modes are considered and its dynamic location is used for mounting process, Presents an editor for assembly structure that offers a intuitive and efficient structure during of altering of parts drawings, Dynamic analysis of assembles definitions, inclusive collision detecting of parts and analysis functions which allows automatic watching of assemble decomposed in parts and generation of materials list in conformity with requirements of beneficiary, Direct access at catalogue of parts and standard assembles. .The maintenance of buildings with higher facade glass walls in hurdles the services of washing-cleaning and periodically inspection of them. Handling cleaning of these frontages' buildings supposed high costs as cleaning handling conditions which are difficult and dangers. The vacuum robot from services fields as cleaning robotic operations of frontages of external glass walls was used to substitute the human operator from hard, danger and risk's workings. This vacuum robot presented makes possible the robotized operations of washing-cleaning, verifying, the range of services which can be made by it can be extended when needed.

1. Calculations are complicated which consumes more time.
2. Cost is high because of the 3D design and pneumatic vacuum system.
3. Due to the multiple facilities power consumption is high.

To overcome the disadvantages of the existing system we proposed a simple and efficient glass cleaning and washing robot.

IV.BLOCKDIAGRAM

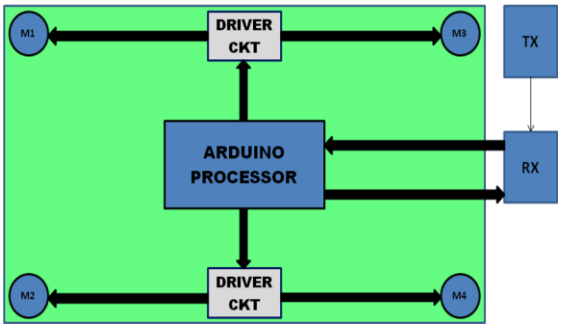

Fig: 1.1[a] EXTERNAL BLOCK ARRANGEMENT

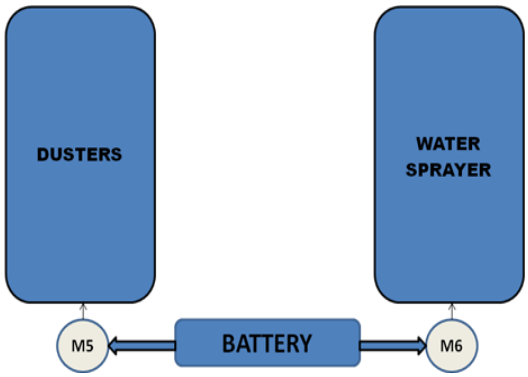

Fig : 1.1[b]. INTERNAL CLEANER ARRANGEMENT

V. PROPOSED DESIGN

There are two block diagrams 1.1[a]&1.1[b] which explain about the duster and internal arrangements. Internally, the microcontroller is connected to two motor drivers which are used to drive the motors present on the corners of the glass. It is also connected to the Bluetooth which is used to receive the commands. The duster setup consists of dusters and water pumps. The water pump sprays the water on the glass, while the duster dusts and cleans the glass. This mechanism is powered up using a 9V battery.

12V DC WIPER MOTOR

The high rotational speeds of these motors causes increased brush wear and needs regular 2021 maintenance. This is the use of brushed dc motors, even though being cheap, they are not economically feasible. Brushless motors were used for higher efficiency and a lower susceptibility and were powered by a dc electric source. The basic components of a brushless dc motors are, permanent magnet rotor & A stator with three, four or more phase windings. An electric circuit to control the phases of rotor windings

Fig : 1.2 Wiper Motor

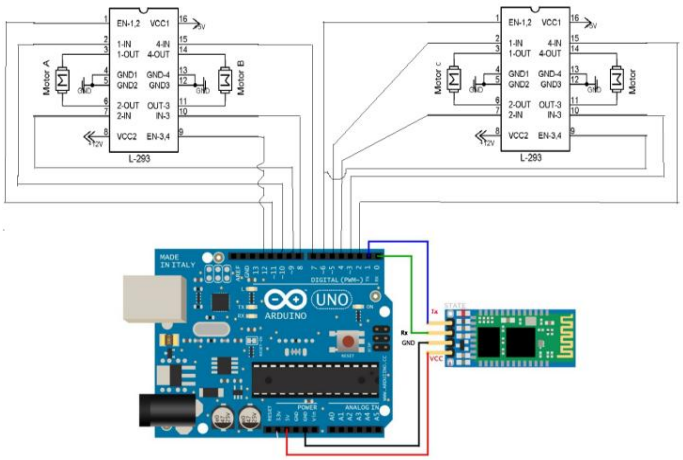

Fig: 1.3 Circuit Diagram

Fig : 1.4 Motor movement

Fig : 1.5. Left and Right Movement

VI. FUTURE WORKS

There is still a lot of space for improvement and for this Cleaning Robot project. This robot covers a very large area which needed creativity, talent and dynamic mentality to fully optimize the technology, knowledge and inspiration of the nature.

The robot can be improved by increasing the motor RPM and rope length according to the glass facades. The water can be recycled by attaching recycle set up.

Some future works are, wireless communication and control with a high range using GSM or Wi-Fi, robot movement in all directions, rotating probe for water force, different types of cleaning tools can be attached based on the application.

Moreover , solar energy technology can be implemented instead of using the batteries.The same cleaning technology can used for painting purposes also in the buildings by making some changes in the methodology

VII. CONCLUSIONS

This project is to develop a robotic glass cleaner that can clean facades. The spider wiper uses rope technology connected with the Bluetooth controlled systems. A prototype has been developed that proves the feasibility of the design. As a conclusion, all objectives for this project were managed to achieve. The objectives are:

1. To improve the easiness of accessing the robot.
2. To reduce the power consumption.
3. To clean the whole glass wall without any scratches.

VIII. ACKNOWLEDGMENT:

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