

A REVIEW PAPER ON ADVANCE BOARD CLEANER USING LASER TECHNOLOGY

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ABSTRACT

The growth of technologies requested higher performance machine in order to fulfil human needs and market. This project is implemented to make human work easier and can reduce the use of human power because of its potential applications. The project automatic whiteboard cleaner is device that clean the whiteboard automatically and reduces the time consume in hand erasing. The principle point of our task is to spare time. It's exceptionally difficult to invest our energy dependably in cleaning of the white board. Our goal is to plan and build up an electric framework typically Automatic White Board Cleaner. Since our adolescence the day we entered school first thing we have seen are blackboards. They established the fundamental frameworks of our insight from the essential ABC's to what we realize even today. India being a nation underscoring on instruction since ages. In any case, the chalks we use on writing boards or the markers on whiteboards should be deleted if next thing is to be taught. This dark or whiteboard eradicating strategy is a repetitive occupation. So to lessen a smidgen time and vitality of the instructors who should raise the cutting edge. We have attempted to design the automatic whiteboard erasing mechanism.

KEYWORDS: Whiteboard, Blackboard eraser institution, intelligent, wipe system, mechanical structure, sensor, motion analysis etc.

I. INTRODUCTION

Whiteboards, erasers and markers are the common instructional materials that instructors have been using nowadays in classroom for discussing lessons every day. Many teachers believe they have found a better way with whiteboards. There's no more chalk dust filling classroom air, no more chalk residue on your fingers, no more clapping the erasers outside after school. Instead, glossy white boards line the walls in a growing number of classrooms a white board is a panel with a shiny, smooth surface that is usually white thus the name. They can be seen in various locations on campus in classrooms, lecture halls, laboratories, libraries, and meeting rooms. Erasing while discussing is such a waste of time and interrupt the discussion. However it was just a bit of time that has been consumed by erasing but the time that had been wasted plays big importance in the discussion part because we have a saying that —TIME IS GOLD. Designing a eraser in such a way that it is not difficult for an instructor to erase the writing while he/she is conducting the lesson without interrupting the class just because to erase the board writing.

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II. LITERATURE SURVEY

[1]. Simolowo and Ngana

The objective of their work which is to design an automated white board cleaner was achieved to an extent. There is need for further fabrication works. The structures of the chains and sprocket were

conceived to fit properly into the cleaning mechanism, but due to inadequate tensioning, prevented the automated duster from performing the required function adequately. The gear mechanism could have been used to reduce the speed of the motor, but considering the weight which it might have on the machine, variable speed regulators were inculcated instead. Due to the forward motion of the duster, sensor was needed to trigger off the motor whenever the duster gets to the end of the board. It can be used to prevent damage of the motor. Finally, the automated duster when fully completed will give an effective cleaning after two to three sweeps. It was recommended that the machine be improved in terms of tensioning of the chains to ensure an effective cleaning and that rollers are placed at the base just in front of the duster, creating a groove where it can move. Finally, proper fitting of bearings on the sprocket are put in place to reduce the load on the electric motor.

[2]. Erika Grace G. Diamante, Katherine H. Flores, Emmanuel Jesus A. Garcia and Lorenzo N. Raralio

The Automatic Whiteboard Eraser was a design project created through PC interfacing using assembly program. This assembly program, based on the test results, was able to manipulate the movement of the prototype. The values for each function of the prototype complies with the values specified in the program thus sending signal to the relays and activate the DC motors. The inputs for the prototype were connected to the push buttons which contain the different functions. With that, the user would only press those buttons to activate the prototype. Among the three materials used as eraser, 3M Erasing Pad proved to be a better eraser used for the prototype. Based on the results, the material could absorb more marker stains compared to the other materials. However, if it was used nonstop, it will be damaged and slows the performance of the prototype.

The Automatic Whiteboard Eraser erases the contents of the board without the user exerting much effort and saves time. After testing the prototype's performance, it was determined that the speed of doing manual erasing was faster than automatic erasing. However, this could not be considered as a major factor. The prototype was not concerned on the time consumed in erasing a 35" x 24" whiteboard. Instead, it was concerned on the time consumed by the user to push the button to activate the prototype. The user does not have to waste so much time and effort to do the job. The Automatic Whiteboard Eraser did the work while the user can do something else.

[3]. Vivek D. Ugale, Aishwarya Marathe, Tiwari Ashutosh, Nilesh Ugale

The method used here was to move the motors placed on the top and bottom of the eraser shaft to clean the blackboard fully. When the user gives the command using the push buttons placed on the transmitter side the encoder will encode the command in a proper format so as to be transmitted. Once the data reaches the decoder and gets decoded, it gets sent to the microcontroller to identify the direction to move and appropriate output was generated so as to make L293d understand in which directions the motors need to move. Once the motor moves it again returns to the middle of the board. Automatic blackboard erasing mechanisms was studied and implemented for erasing the blackboard automatically. It provides a better solution for the health problems, time constraints in the class rooms. We learned the basic methodology to use DC motors so as to initiate movement of shaft and microcontroller to control the movement of the shaft.

This Project can be further modified into a gesture controlled eraser by using camera and DSP processors so as to identify the movement of the users hand and make the duster do so. This project can also be modified to clean glass as present on high buildings which is a very risky job for any human to perform.

[4]. Muhammad Zulfadhli Bin Zulkifli

Development of machine and robot nowadays is quite popular and faster in marketing. So to help and give benefit to humankind the research and development of XY Duster Machine was an alternative machine that can help lecturer, teacher and student to keep their duty clean a whiteboard by using this machine.

In their project, there were some problems that occurred and must be solved to make it perfect. The problem occurs from the design was the efficiency of movement duster machine. In order to make the machine in high performance and good condition many factor need to be considered. Development of the machine must be tough form the mechanical design, electronic design and how to control it. All factor of measurement of design must be accurate.

In electronic design the best way to control the machine was using a microcontroller. This microcontroller act as brain of the machine and make the machine much more intelligent. In their project PIC was use as microcontroller for the project.

As conclusion, an automatic whiteboard cleaning machine was designed and fabricated using low cost material and with user friendly interface. This machine can potentially be used in class rooms to assist the teachers in keeping the whiteboards cleaned.

Even though, XY duster machine successfully fabricated but this machine needs some improvement to add to make this machine in high performance and comfortable to the user. Further research must be done in order to make the machine meet the specification and requirement for commercialized purpose.

[5]. Rubhini, Mrunalini

The project was about finding a real time solution for the problems caused by the chalk pieces used in the class room. To overcome the problems that are faced daily by the students and faculty, the project entitled 'Real Time Automatic Blackboard Eraser using Embedded System' had been suggested to automatically erase the blackboard. DC motors of three different types were used for the movement of the instrument. The instrument moves forward and backward erasing the board and collecting the dust automatically from the erasing material due to the rotation of the roller. These processes were automated using PIC16F877A microcontroller. Thus the device avoids the dust flow in the environment and thereby providing good solution for the problems faced by the student, faculty and other electronic equipments inside the class room in a cost effective and time efficient way.

The real time automated black board eraser was used to clean the board automatically and to absorb the dust produced during erasing the board. The model consists of a wiper motor which was used to move the entire erasing apparatus from one end to the other end for complete erasing of the board.

A DC Gear Motor was used to rotate the roller that was wound with the erasing material. This material was used to erase the board and get hold of the dusts after erasing. A scrubber was used to remove the chalk dust that gets settled on the rubbing material. The vacuum cleaner was used to absorb the chalk dust that fall inside the erasing apparatus.

The entire apparatus was placed parallel to the board placed at one end. The roller wound with eraser was placed at zero gap between the board and the eraser, so that it erases the board cleanly. The microcontroller PIC16F877A was used to automate the entire process. The circuit designed for the automation was fixed to the wall. The cables were connected using connectors.

[6]. Sunil R. Kewate, Inzamam T. Mujawar, Akash D. Kewate, Hitesh R Pant

The traditional blackboard chalk dust was a common problem in the traditional blackboard-eraser-chalk architecture. It was generally known that erasers for cleaning the black boards in school rooms soon become saturated with chalk dust and have to be cleaned. In the past, this has usually been done by clapping the erasers together. This operation produced a great deal of dust that was rather objectionable both from the standpoint of health and cleanliness. For this reason, the design was based on the traditional blackboard-eraser- chalk called intelligent wipe chalk system, its connotation of "smart" includes moving, positioning, wipe. The design was able to achieve automated clean the blackboard and collect dust in one stroke. In their paper, they introduces the design and principles of sliding type wipe mechanism and also carried out the implementation and experimentation for motion analysis. The paper puts forward a kind of mechanism design scheme, the mechanism can automatically detect the blackboard chalk stains, and erase the font, keep the blackboard clean. The further research work was based on computer processing i.e. on two parts of information processing unit and motion control unit.

Compared with manually wipe, smart wipe has a good effect and runs smooth with good reaction speed. The rate of rotation of the motor can be set in accordance with the requirements of the wiping speed to suit the requirements of different occasions. The smart eraser had a simple structure, easy to operate, easy to obtain raw materials, manufacturing equipment simple process. Its Control functions, and less susceptible to interference, high reliability, ease of use, can make products with high performance and low cost. The product is suitable for large, medium and small institutions, the promotion of certain significance.

[7]. Prof. Sanket Nirmal, Khushboo Kartari, Disha Puri, Badal Girade & Gayatri Pande

Manual work was needed to clean a board which further extends time consumption while taking classes. Moreover chalk dusts not only harm the human but also the machines. Equipments that are used in the class rooms like projectors when exposed to the chalk dusts which was not heavy get easily settle on the equipments. That was one of the reasons for heat production in the equipments, when large amount of heat produced the equipment may wear out before its actual life period ends. Even when the board cleaners are available, it takes lecture time away from the lecturer to erase the board. This need for a faster, time saving and readily available cleaner has given birth to the design of an automatic wireless blackboard cleaner that can clean the board effectively in the least amount of the time possible. In this project, care was taken that dust will not spread in the classroom.

According to them blackboard will be erased automatically without any manual support. User has to only press appropriate key of mobile App to erase the blackboard in required manner. User can erase the required portion of the blackboard. No need to erase the whole blackboard. User has to take care that appropriate key assign for that direction of blackboard must be pressed. In their project, provision was provided for the effective chalk dust collection. After cleaning the blackboard chalk dust was automatically collected in the box placed below the board. Wireless system was provided to erase the board from defined range of distance. Mobile App was provided to make the system user friendly. User has to press the appropriate key to erase the board from defined range distance.

[8]. Pranil Sawalakhe, Aditya Kumar Singh, Tapash Panda

In the previous time the problem of cleaning the whiteboard had a great importance as it is now where the man was responsible for manual cleaning. This invention has a great progress and a big factor and helpful for the man. Robot is a group of mechanical systems that carry out man's orders. There are many applications that use robots and automation in different aspects of life such as industry, medical, domestic machines and etc. In their paper, the work had been devoted for the use of robotics and robots in cleaning process. The whiteboard cleaning robot was one of the robots that had emerged in recent decay. The robot can be used in schools, colleges and offices. The main target was to design a robot that can clean whiteboards efficiently and rapidly. The robot operated by a single switch. The motion was generated by two D.C motors.

When the power supply was on, the motor along with the pinion starts rotating over the rack. Because of this, the panel moves from left to right and vice versa with the help of switch. The duster attached to the panel clean the whiteboard smoothly.

The automatic Whiteboard cleaning robot was successfully designed and fabricated. The components used in this work were simple and cheap. In general the system works adequately as anticipated in the design process. The cleaning process takes about (4-6) seconds to finish a 350cm²Whiteboard. The time depends on the speeds of the motors and the degree of dirtiness of the Whiteboard.

III. CONCLUSION

After studying the different research papers of blackboard and whiteboard cleaning system with different mechanisms the objective has been finalized that is the implementation of blackboard or whiteboard cleaning system. This machine will overcome the problem that occurs in the school/universities related to clean the boards while teaching. There are two main objectives of doing this project. First objective is to design a low cost and user friendly whiteboard or blackboard cleaning machine which can clean the board using laser technology. Second objective is to enhance the efficiency and accuracy of the movement of duster. The purpose of this objective is to make the movement of this machine accurate even if it has been used many times. Another purpose of this machine is to make the work faster and smoothly. This aims to prevent users from waiting for the cleaning process to be done and also to avoid wasting time there.

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