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Whiteboard Cleaning Mechanism for Classrooms

Prof. B. S. Rakhonde[1], Roshan Rajas[2], Pratik Bhivate[2], Dhananjay Mhaisane[2], Prasad Patil[2], Pratik Jadhav[2]
Department of Electrical (Electronics and Power) Engineering
Shri Sant Gajanan Maharaj College of Engineering Shegaon, Maharashtra, India- 444203

Abstract: *Now-a-days white boards are widely used in almost every educational institute. About 70-80% educational institute around the world uses white board as the writing medium in their class room. They are large in size, for that reason it is very time consuming process to erase the writings from the board with duster. Using duster also reduce the visual quality of the board. If a class continue about one hour then about 8-10% time become waste because of cleaning the board using duster. Considering this "The board wiper", an cleaning system can solve these problems. The board wiper will shorten the time and also the effort. It takes around 8 sec to clear the board without destroying the quality. The wiper has horizontal movements and it wipes the board twice at a short time. The wiper consists of electric motor, supports, a wiper bar and a without microcontroller switching technology to give that an automation figure.*

Keywords: Whiteboard, Wiper, Motor.

I. INTRODUCTION

In this project we are working on automated whiteboard cleaning mechanism for classrooms. White board have become a central tool by which corporate organization, institution and other professional use as a mean of proper education and training. In that system we are going to used bored wiper which consists of electric motor, supports a wiper bar and without microcontroller switching technology. It is possible to control the wiper by a remote control system and this allows the controller to wipe the board from a reasonable distance. And it has an advantage to remove the wiper if it's necessary to clean and the whole wiper system can be established at a very low cost. So, "The Automate white board cleaning mechanism" is a spectacular replacement of "duster" and it can be suggested to use this to reduce the effort of the board user as well as to introduce the classroom with an automation system.

II. METHODOLOGY.

2.1 Construction

- In this White Board cleaning mechanism for classrooms a white board is fitted on a metallic square pipe stand. Two plastic or nylon racks are provided at the either horizontal sides (upper side and lower side) of the board. Two gears are arranged on the both racks through a shaft which is coupled to a geared D.C. motor.
- This motor works on 12 volt dc. As the motor is fitted on the moving rack system it moves to and fro on the board if it is supplied power. Long shaft of the motor is attached to a long foam eraser sliding on the board. This eraser foam faces towards white board for cleaning purpose.
- Connection of motor is made with control panel. This control panel consists of Power supply, Motor direction Control Relay, Eraser Forward Movement relay, and a Light Activated relay switch.
- A Push to on Normally open Push button is provided near board at the lower left side to start the cleaning of the board. A N/O push button which is known as “Reverse Movement Control Push Button” is provided on the right middle of the board.
- In a light activated relay system a LDR is situated in front of a continuously glowing white LED provided at the left middle of the board. Near by this LDR switch a N/C micro push button is provided. This N/C/ push button is known as Forward Displacement switch. A flap is provided at the left center of the eraser pad.
- This flap obstruct the LED light incident on LDR when eraser pad slides at the most left end position. Below this flap a notch provided on the eraser to push a “forward Displacement Switch” (N/C). At the middle right of the eraser a notch is provided to push “Reverse Movement Control Push (N/O) button”

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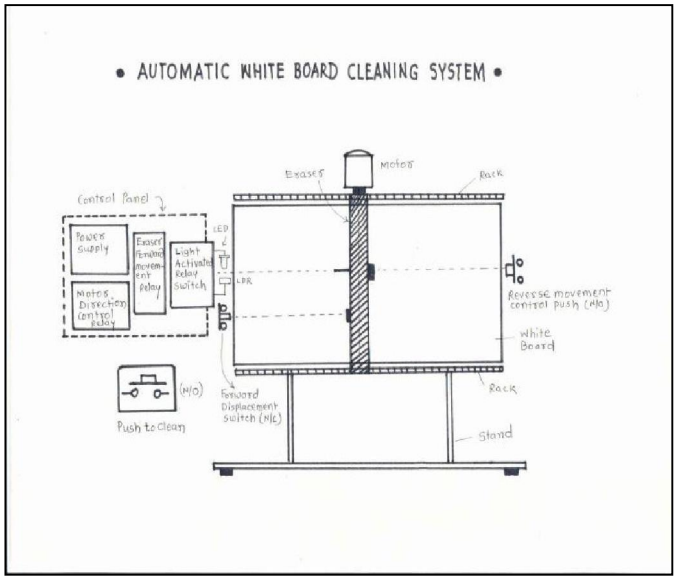

Fig 1: Circuit Diagram

WORKING

- When " White Board Cleaning mechanism" is in rest condition, that time the flap of the eraser is in between LED and LDR. Power supply is made "On", in this condition power supply is connected through the N/O contact of Light activated relay to the whole circuit. Hence the supply is cut to the circuit.
- When Push to Clean is pressed LDR relay switch becomes on since power supply is charged to the motor direction control relay circuit. As the motor rotates the flap is moved out of the LDR and that circuit remains on.
- The displacement of the eraser is continued toward right of the board when at the most right end position eraser reaches "reverse movement control push (N/O0 is pressed by the notch ; that is why the direction of the motor is changed since eraser forward movement relay is made on. Eraser reaches near LDR switch and again flap stops the system
- If Push to clean button pressed again motor direction control relay becomes "on" and eraser left side notch presses the forward displacement switch (N/C) switch thereby direction of the motor is reversed and function is repeated.
- If the Push to Clean button is pressed for long time the to and fro motion of the eraser is continued till that switched is pressed.

III. RESULTS

By taking trial of our machine and gathering all information of other methods, we have got following result.

- The machine shows a desired effect for erasing of board in minimum time with minimum marking remains on board.
- The machine work faster and smoothly.
- Time of cleaning of is 15 seconds.

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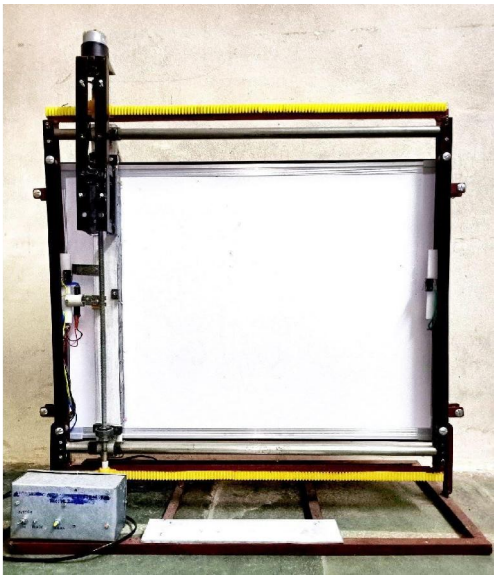
IV. EXPERIMENTAL SETUP



V. CONCLUSION

In new era of technology, people want something new in their life. They want every single thing they look in front of their life look sophisticated. People want something that can improve their lifestyle and help them do their job by use of robot or machine. That is why development of machine and robot is nowadays quite popular and faster in marketing. So to help and give benefit to humankind the research and development of Automatic Duster Machine is an alternative machine that can help lecturer, teacher and student to keep their duty clean a white board by using this machine. In this project, there were some problems that occurred and must be solved to make it perfect. The problem occurs from the design is the efficiency of movement of duster machine. In order to make this machine in high performance and good condition many factor need to be considered. Development of this machine must be tough from the mechanical design, electronic design and how to control it. All factor of measurement of design must be accurate. 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.

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