

Design and Development of Automatic White/Black Board Cleaner

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Abstract -The aim of the paper is to study as well as review the advancements in white/black board cleaner. It is desirable to design a board cleaner which will help the user to erase the board with much ease and little effort. The development of board cleaner from traditionally used duster to automatic cleaning duster has been studied. In modern society it is important to develop board cleaner, which can maximize accuracy and minimize time required, for cleaning in their daily life. This project will also help to reduce the health problems caused during the cleaning process.

Key Words: Spring reels, Vertical sliding frame, Supporting frame.

1. INTRODUCTION

Education is back bone of a nation. Education comprises of teaching and learning. The resource and material required in teaching gets updated over time along with other teaching techniques. Earlier teaching used to be done on walls, sand and slates made out of woods but from last decade it has evolved to blackboards and now whiteboards are replacing the blackboards. The physical work required to erase the board is quite hectic for the professors and also the chalk dust caused due to erasing and dusting not only effects the teachers but also to the students sitting near-by. The chalk dust can also lead to various other things like respiratory problem and sometimes may even lead to hair loss when exposed over a long period of time. So there is a need for automatic cleaning board in today's modern world.

An automatic blackboard cleaner is a device that is generally used to clean the board automatically with the help of duster. By using this device, we can save time, energy and effort require for cleaning purpose. The aim behind this project is to reduce the health issues occur during cleaning of boards and make it user friendly. Thus, the goal of the literature review is to study advancements in board cleaning. For the reasons mentioned above there is a need for an automatic board which can assists the user. All limitations have been overcome by the proposed design in this paper.

2. LITERATURE REVIEW

This section includes the data of the available board cleaning systems from the sources like

- researchgate.net, www.ajol.info, etc websites were referred.
- Internet surfing and key words were used to search research articles (published) from the search engines like Google.
- International journals were referred for the information purpose.

The paper put forth is a simple mechanical design, on a single click automatically wiping action will be performed.

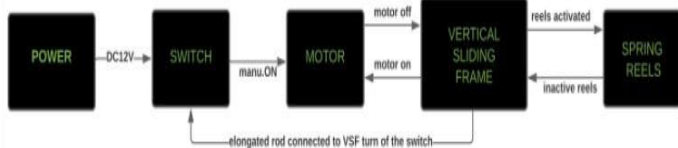
3. PROBLEM STATEMENT

- The traditional method to clean the board leads to various issues like the powder obtained from the chalk piece causes problem to the respiratory organ when inhaled.
- Problems like hair loss, burning of eyes etc. Lecturer/professor when teaching on board do not have time to take a pause which leads to shoulder problems.
- The size of the whiteboards are gigantic which creates the wiping action tedious and time consuming.

4. WORKING

- a) First of all check the power supply is ON.
- b) As soon as we turn on the switch, the motor placed on left side of the board comes into action.
- c) The pulley mounted on shaft of the motor starts rotating.
- d) Vertical slider duster frame sliding within aluminium supporting frame initially placed on the right side of board.

- e) This pulley with the help of ropes connected on one side of the vertical slider duster frame will starts pulling toward left side.
- f) When the vertical frame moves, the duster placed on the inner side of frame performs the cleaning action once.
- g) As soon as the sliding frame reaches the left side of the supporting frame the extended rod placed at the bottom of sliding frame will turn off the switch.
- h) As soon as the switch turns off the motor stops and the spring reel come into action.
- i) This spring reels pulls back the slider frame to its initial position.
- j) And again the system is ready for cleaning purpose.



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[3] Dhananjay N. Jadhav, Aditi H. Manajan , Mayuri B. Surve & Pramod R. Sonawane “ Automatic Board Cleaning and Curtains Operation” Imperial Journal of Interdisciplinary Research(IJIR) vol-3,Issue-4, 2017,ISSN: 2454-1362,

[4] Tsado Jacob, “A Remote Controlled Motorized White Board Cleaner”, AU Journal of Technology, Vol.15, No.4, pp. 273-280, 2012.

[5] Bhushan Tukaram Chougule and Puneet Mathur, “Automated Motorized Sensing Whiteboard”, International Journal Of Advanced Research In Engineering And Technology (IJARET), Vol. 5, No. 3, pp. 155-163, 2014.

[6] Imam-Ul-Ferdous and A.H.M Fazle Elahi, “Development of an Automatic Board Cleaning system using Microcontroller”, International Conference on Mechanical, Industrial and Energy Engineering 2014 (ICMIEE: PI-140307), Khulna, Bangladesh.

5.CONCLUSIONS

- The system with innovative features will reduces human efforts and makes teaching efficient.
- Compared with manually wipe, smart wipe has a good effect and runs smooth with good reaction speed.
- The system has a simple structure, easy to operate, easy to obtain raw materials, manufacturing equipment simple process. , high reliability, ease of use, can make products with high performance at low cost.
- At single power the wiping action will be performed twice.

REFERENCES

[1] Mr. Sunil R. Kewate , Mr Inzamam T. Mujawar, Mr. Akash D. Kewate , Mr.Hitesh R. Pant’, Development of New Smart Design to Erase the Classroom Blackboard of Schools/Colleges’, IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) e- ISSN: 2278-1684, p-ISSN: 2320-334X PP 57-61 .

[2] Sonia Akhter, Anindo Saha ,Md.Rayhan Parvez koushik, Md. Asaduzzaman, Razoana Islam Shorna, Md.Moudud Ahmed “Automatic Whiteboard Cleaner Using Microcontroller Based Rack and Pinion Mechanism”