Asian Journal of Applied Science and Technology (AJAST)
Volume 1, Issue 2, Pages 40-42, March 2017

Microcontroller Based Handy Free Duster for Classroom

M.Agalya Devi[1], R.Aruna[2], M.Arrthi[3], A.Jeevalekha[4], A.Mariyammal[5]

[1]*UG Scholar, Department of ECE, Vivekanandha College of Engineering for Women, India. Email: agalyadevi95@gmail.com*
[2]*UG Scholar, Department of ECE, Vivekanandha College of Engineering for Women, India. Email: arunarathi1996@gmail.com*
[3]*UG Scholar, Department of ECE, Vivekanandha College of Engineering for Women, India. Email: arrthy.nandha@gmail.com*
[4]*UG Scholar, Department of ECE, Vivekanandha College of Engineering for Women, India. Email: jeeviayyapan11@gmail.com*
[5]*Assistant Professor, Department of ECE, Vivekanandha College of Engineering for Women, India. Email: apmariyammal148@gmail.com*

Article Received: 20 February 2017 *Article Accepted: 28 February 2017* *Article Published: 02 March 2017*

ABSTRACT

The augmentation of knowledge demanded superior recital appliance to fulfill human desires and arcade. It is implemented to make human work easier and can reduce the use of human power because of its potential application. Microcontroller based hand free duster for classrooms is device that clean the blackboard automatically and reduces the time consume in hand erasing. It 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 duster includes a track the structure to permit reciprocation of the duster laterally of an elongate blackboard frame. The chain which is connected to duster includes the drive motors to effect rotation of a coerce duster located above the chalkboard structure. This appertains to new and useful improvements and more particularly to an apparatus whereby blackboard can be cleaned it an easy and convenient manner. The principle object of the present handy free duster is to provide an attachment for blackboards in the form of a power driven erasing apparatus which can be set in operation by the throw of the switch. It is used to eliminate the drudgery of manually cleaning the blackboards.

Keywords: Black board, duster and LCD.

1. INTRODUCTION

Blackboard and whiteboard cleaning system through different mechanisms, the intention of the implementation is the blackboard or whiteboard cleaning system with rack-pinion mechanism. This machine will overcome the problem that occurs in the school/universities related to clean the boards while teaching. First objective is to design a low cost and user friendly whiteboard or blackboard cleaning machine which can clean the board with a single key input. Second objective is to improve the effectiveness and precision of the mobilized duster. The purpose of this objective is to make the movement of this mechanism precise still if it has been used numerous times. An additional idea of this mechanism is to construct the vocation quicker and efficiently. This aims to prevent users from waiting for the cleaning process to be done and also to avoid wasting time there.

A microcontroller based handy free duster for classroom, a device that is generally used to clean board without human intervention. It is a new expertise that is normally used to keep time and energy. A device for automatically erasing a blackboard where in a duster is mounted for longitudinal moment on the blackboard and has a motor mounted there on that is interconnected to a drive assembly for producing the moment of the duster in an erasing operation.

The utility model relates to teaching aid. The prior blackboard has no automatic cleaning function, a teacher squander time in writing and erasing, and the use is not ideal. The utility model provides the habitual blackboard cleaning system consisting, an electric blackboard eraser, and a soft covered blackboard. The structure is simple, the use is convenient, clean and sanitary, and the effect of saving time is good. Handy free dusters are made so as to ease the monotonous job of erasing blackboards by teachers or students. Chalk dust or the marker ink may prove perilous to health to both the teacher as well as student. So to reduce such problems habitual blackboard dusters are one of the alternatives. The manual method of erasing has one more shortcoming as 'TIME'. The time wasted during the blackboard erasing can be utilized for much better purposes like teaching or attendance.

2. LITERATURE SURVEY

Since our childhood the day we entered school first thing we have seen are blackboards. They laid the basic foundations of our knowledge from the basic ABC's to what we learn even today. But the chalks we use on blackboards or the markers on whiteboards need to be erased if next thing is to be taught. This black or whiteboard erasing method is a dreary job.

Billie R. Crisp [2] proposed a system in 1973, a handy free duster erasing apparatus for classroom use. The movement of the shaft fixed with the eraser was primarily done by manual switches. But the most characteristic part of the mechanism was the plural dusters embedded on the shaft so as to increase the duster range as well as cleaning the blackboard became much easier. The electric motors span the whole blackboard so as to move the duster along it. The rollers at top and bottom do traverse motion.

In1993 Solomon Frost [3] designed a blackboard erasing system. The blackboard is mounted with the cleaning apparatus fitted to the wall. It includes a separate duster apparatus rather than the cleaning material which was used in the previous models. They proposed that rather increasing the expenses on a complex mechanism as well as custom built vertical erasers we should use the normal dusters fitted on a

separate block which then movers around the whole blackboard erasing it.

In 2002 Chirag Shah [4] tried to make the blackboard system with Sensors to the motors to initiate motor movement. The mechanism control switches were with the user. The duster moved to and to erase the blackboard. Once the motor starts moving the gear and counter gear connected to the transferred rod which then moves the shaft.

The most advanced blackboard model was designed by Janzen Liu, Zhongs Zeng et al., this blackboard erasing system was the most advanced blackboard erasing mechanism which used cameras and digital image processing to erase the erasable markings present on the blackboard. This was hardware and software connected system.

3. DESCRIPTION

The time wasted during the blackboard erasing can be utilized for much better purposes like teaching or attendance. The system is to interface the mechanical aspects of the mechanical erasing system with micro controllers so as to enhance it into automation rather than manual, using PIC micro controller to interface the board erasing mechanism. DC Motor is used for the purpose of rotating the roller that is wound with the erasing material.

4. MICROCONTROLLER BASED HANDY FREE DUSTER

Since it is a gear motor it produces high torque to rotate the roller with a zero gap between the erasing material and the board. In a gear motor, the magnetic current (which can be produced by either permanent magnets or electromagnets) turns gear that is either in a gear reduction unit or in an integrated gear box. A second shaft is connected to these gears. The result is that the gears greatly increase the amount of torque the motor is capable of producing while simultaneously slowing down the motor's output speed.

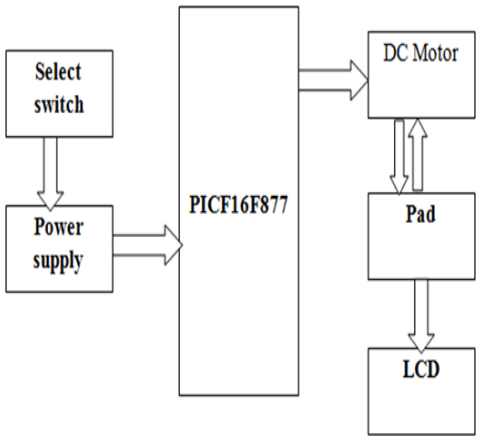

Fig.1. Block Diagram of Microcontroller Based Handy Free Duster

The motor base denotes the base that holds the DC gear motor when the apparatus moves to and fro. As the DC gear motor is used for the rotation of the roller which has to be done throughout while erasing the board, the motor thus has to be moved along with it. Hence a base is placed on the frame to hold the motor. A blackboard or chalkboard is a reusable writing surface on which text or drawings are made with sticks of calcium sulphate or calcium carbonate, known, when used for this purpose, as chalk.

Lecture theatres may contain a number of blackboards in a grid arrangement. The lecturer then moves boards into reach for writing and then moves them out of reach, allowing a large amount of material to be shown simultaneously. The eraser apparatus consists of roller that rotates with the help of a DC gear motor.

To design a handy free duster using basic argument parts like power attach, behaviour, enthusiast, eraser, guide ways, power supply. Aim is to get cost of model to minimum along with having considerable rubbing effect for general lightening purpose.

At present few automatic board eraser built in the world. This problem will be eliminating with the development of automatic board eraser mechanism. The concept is consisting nut and screw mechanism. Square thread screw is coupled to motor. When motor shaft rotating, screw also rotating and nut slides linearly on screw. Duster is attached to nut. When nut slide, duster also slides and will get desirable rubbing effect.

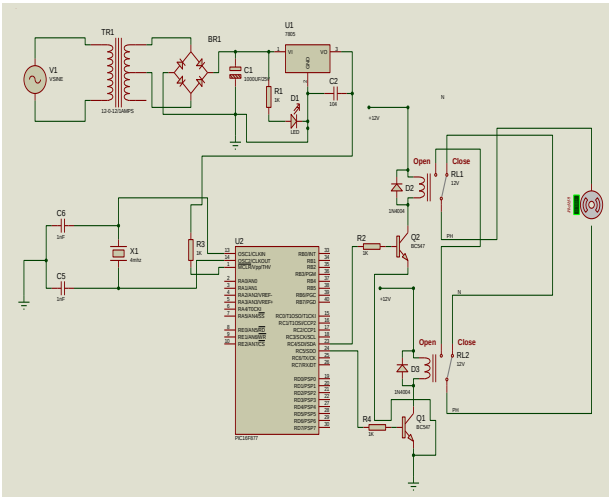

Fig.2. Circuit diagram of Microcontroller Based Handy Free Duster

The growth of technologies requested higher performance machine in order to fulfill human needs and market. It is implemented to make human work easier and can reduce the use of human power because of its potential applications. This appertains to new and useful improvements and more particularly to an apparatus whereby blackboards can be cleaned in an easy and convenient manner.The mechanism can automatically detect the blackboard chalk stains, and erase the font, keep the blackboard clean.

The duster includes a track structure to permit reciprocation of the duster laterally of a make longer blackboard frame. The principal object of the present automatic blackboard duster is to provide an attachment for blackboards in the form of a

power driven erasing apparatus which can be set in operation by the throw of a switch, thus eliminating the drudgery of manually cleaning blackboards.

4.1 Method of Implementation

Although the chalks we use on blackboards or the markers on whiteboards need to be erased if next thing is to be taught. This black or whiteboard erasing method is a tedious job. So to reduce a little bit time and energy of the teachers who shall rise the next generation we have tried to implement the blackboard erasing mechanism.

In this fast growing world there are different new technologies adopted to increase work rate in minimum time period. Thus, handy free duster is also a new technology for cleaning the board automatically in minimum time period. In this advanced world the competition is increasing day by day, thus the time of every person is most precious. As handy free duster clean the board in less time and saves the time of student which is too important.

4.2 Testing

This 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. It has both hardware system and software have been connected with each other, and tell us how to get installed. It introduces the principle of the mechanism, the method of image processing, and calculates the relationship of the displacement, velocity, acceleration and structure. This wipe mechanism adopts crank slider mechanism which has a good wipe effect.

4.3 Validation

In the present time not everything is automatic but seeing towards progress of present technologies, In future everything will be operated automatically. So this will serve as one of the advanced technology in future and will be installed in every college, school, etc. Seeing towards our basic version, there are some ideas for the future development of Automatic Blackboard cleaning System.

5. CONCLUSION

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 has a simple structure, easy to operate, easy to obtain raw materials, manufacturing equipment simple process. 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.

Blackboard erasing mechanisms have been studied and implemented for erasing the blackboard automatically. It provides a better solution for the health problems, time constraints in the class rooms. Blackboard erasing mechanisms have been examined and actualized for age dictating the blackboard consequently. It gives a superior answer for the health issues, time limitations in the learning halls. It takes the principle of attitude to utilize DC engines to start development of shaft and microcontroller to control the development of the pole.

REFERENCES

[1] Graylord.A., “Chalk board cleaning apparatus with fluid reservoir”, September 2015.

[2] Deepanjan Majumdar, “Assessment of Airborne Fine Particulate Matter and Particle Size Distribution in Settled Chalk Dust during Writing and Dusting Exercises in a Classroom”, *SAGE Journals*, 2012.

[3] Chirag Shah, “Automated Board Eraser”, *Patent US 6,948,210 B1*, 2005.

[4] Solomon Forst, “Apparatus for Cleaning Blackboards”, *Patent US531980*, 1993.

[5] Billie.R.Chrisp, “Automatic Chalkboard Erasing Apparatus”, *Patent 3731335*, 1973.

[6]*www.docstoc.com/docs/443109591/automatic-blackboard-eraser-apparatus-patent-5216776 for referring the paper regarding blackboard eraser design.*

[7] *http://www.ti.com/lit/ds/symlink/l293.pdf.*

[8] *http://www.holtek.com/pdf/consumer/2_12ev 120.pdf.*

[9] *http://www.holtek.com/pdf/consumer/2_12dv120.pdf.*