DESIGN AND FABRICATION OF AN AUTOMATIC WHITEBOARD CLEANER

A thesis report submitted to the department of mechanical engineering for the partial fulfillment of the degree of Bachelor of Science in Mechanical Engineering

A Thesis by

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LETTER OF TRANSMITTAL

January, 2024

To

M. I. Washif Rahman

Lecturer

Department of Mechanical Engineering.

Sonargaon University

Subject: Submission of Project Report**.**

Dear Sir,

We are pleased to submit the project report on **"Design and Fabrication of an Automatic Whiteboard Cleaner".** It was a great pleasure to work on such an important topic. This project has been done as per instruction of your supervision and according to the requirements of the Sonargaon University.

We expect that the project will be accepted by the concerned authority we will remain happy to further explanation that you may feel necessary in this regard.

Thank You

Sincerely yours,

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DECLARATION

We do hereby solemnly declare that, the work presented here in this project report has been carried out by us and has not been previously submitted to any University/ Organization for award of any degree or certificate

We hereby ensure that the works that has been prevented here does not breach any existing copyright.

We further undertake to indemnify the university against any loss or damage arising from breach of the foregoing obligation.

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ABSTARCT

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 automatic 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 micro-controller to give that an-automation figure. 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 Automatic board wiper” 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.

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CHAPTER 1
INTRODUCTION

1.1 Introduction

When we said teaching and learning process we will focus on teacher and student, who are person that delivering and receiving information and knowledge. How do they deliver their knowledge to student? Nowadays, there are many methods which are used by teachers to deliver their knowledge such as computer, note given by teacher and at last but not the least whiteboard or blackboard as medium to deliver the information to student. The invention of black boards was a revolutionary change in the history of mankind which led to the development of the society. One of the problems we are experiencing in our classroom is erasing the blackboard. Chalk dust scatter causing extreme nuisance especially for people who have asthma.

Also, chalk dust causes skin irritation and serious health problems. [1] Blackboards require lot of time to get rubbed which increase the demand of whiteboards. The first whiteboards were very expensive and was made of enameled steel but seeing the growing demand in the market cheaper whiteboards made of steel with polyester or acrylic coating of white color omit were launched. Innovations in the field of whiteboards were done since a long time. Different types of whiteboards like laminated chipboard, high pressure laminated boards and porcelain boards were launched in the market for cheaper alternatives. [2] Modifications were also done in cleaning and rubbing methods of whiteboards. Remote control motorized cleaners were innovated to reduce the human efforts required for cleaning. This type of cleaner is operated by motors and is controlled by switch or remote.

For teaching purpose generally, boards are used. For effective learning board is the basic thing in classroom. The powder obtained from the chalk piece while erasing the blackboard causes problem to the respiratory organ when inhaled by human. Those who are allergic to dust cannot sit near the blackboard. Other than this there are more problems related to
the dust or chalk powder like hair loss, burning of eyes etc. For cleaning the board manual work has to be done by the teacher which is time consuming while taking classes. Moreover, chalk dust not only harm the human but also the machines such as projectors when exposed to chalk dust there could be heat production in it.

1.2 Background Study

In the very past cave man used the wall of the cave as the writing medium. There they used the board to capture various memories or the story of their own culture and daily activities. As the time goes on and a civilized society was being formed the scenario begun to change. In the middle age people began to use a big slice of the wood piece as the board, and coal as the pen medium. [3] But it was not so comfortable and it became nasty. Then the black board had been introduced. It's nothing but a black canvas where a chalk is used as the pen medium. Chalk is a composite of calcium carbonate and it look s like a stick. It was comfortable but it creates dust during wiping the board using the duster. A duster is device which is used to wipe the writings from the board. Though the black board has not lost its popularity as in present time and it's being used widely across the world. But a white board is the modified version of the blackboard. Here a marker pen is used as pen medium and as duster a piece of cloth or a foam duster. As the whiteboard has the advantage of not creating the dust as it only makes the duster dirty and it is very much comfortable using marker pen as it comes in different colors. Across the world now white board is the best writing medium during teaching. Now almost everything is automated. And the automation system has the capacity to reduce the human effort and to make any arrangement easier. And those became possible for micro-controlling system. The Arduino micro-controller is an open-source hard ware controller which is designed to ease any mechanism by using electronic commands.

1.3 Problem Statement

In educational and office environments, whiteboards are commonly used for presentations and lectures. However, over time, whiteboards accumulate markings and become increasingly difficult to read, affecting the quality of presentations and the overall learning or communication experience. Manual erasing is time-consuming and can disrupt the flow of a presentation. Therefore, there is a need for an automated solution that can efficiently and autonomously clean whiteboards, ensuring they remain clear and ready for use without human intervention.

1.4 Objective

We have some specific objectives for this project and they are pointed below:

- To design & construction of Design and Fabrication of an Automatic Whiteboard Cleaner.
- To implementation of Automatic Whiteboard Cleaner.
- To take some output for future modification in our work.
- To study the system performance for future reference and improvement purposes.

SCOPE OF RESEACH (LIMITATION)

i. Only suitable for whiteboard that has smooth surface.
ii. Only the 4 ft by 3 ft whiteboard can accommodate the Automatic Whiteboard Cleaner.
iii. Using material made from Styrofoam and felt cloth to make erasing process is easier.
iv. After turning on the power, the dusting operation will continue until it is turned off.
v. Dust from permanent markers cannot be removed.

1.5 Structure of the Project

This Project is Organized as Follows:

Chapter 1 Introduction: The first chapter contains the statement of the introduction, our background study for the project, problem statement, objectives of the study and the project outline.

Chapter 2 Literature Review: The chapter two contains our introduction, literature review part.

Chapter 3 Hardware and Software Analysis: Chapter three describes the theoretical model. Here we mainly discuss about proposed system Hardware and software development of our project etc.

Chapter 4 Methodology: Chapter three describes the theoretical model. Here we mainly discuss about proposed system architecture in details with having block diagram, circuit diagram, structural diagram, project working principle, complete project image etc.

Chapter 5 Calculation and Data Table

: Chapter five deals with the Calculation and Data Table about our project

Chapter 6 Result and Discussion: Chapter six deals with the result and discussion and discuss about our project advantages and application.

Chapter 7 Conclusion: Chapter Seven all about our project conclusion and future scope.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

In this section things relating to Automatic Whiteboard Cleaner are included. These represent a sampling of difficulties appropriate for application of Automatic Whiteboard Cleaner. The list of references is condensed here.

2.2 Literature Review

This section encompasses a review of various systems for cleaning whiteboards and blackboards, drawing insights from different research papers and their mechanisms.

S. Joshibaamali and K. Geetha Priya (2015) introduced a machine capable of three selectable operating modes: cleaning the left side, the right side, or the entire board. It utilized two stepper motors for horizontal and vertical movement and a linear motor for up and down motion. Infrared transceivers detected horizontal direction, and limit switches were used to detect board boundaries. A dsPIC30F401 microcontroller in C language served as the main controller. [1]

Mr. Sunil R. Kewate, Mr. Inzamam T. Mujawar, Mr. Akash D. Kewate, Mr. Hitesh R. Pant (Year not mentioned) designed a sliding-type wipe mechanism capable of automatically detecting chalk stains on blackboards. Their system employed two motors, three guide rails, and three sliders. Mechanical components included sliders connected by cross guide rails, allowing parallel movement, and motors A and B driving horizontal and vertical slider movement, respectively, for efficient cleaning. [2]

Sonia Akhter, Anindo Saha ,Md.Rayhan Parvez koushik,Md. Asaduzzaman, Razoana Isla m Shorna, Md. Moudud Ahmed explained that when the teacher switch on the supply, current is passed to the 18V adapter and then it passes through Arduino. To sense the distance and time specified by ARDUINO , a sonar sensor is used, hence the motor rotates in both clock-wise & anti-clockwise direction [3].

Dhananjay N. Jadhav, Aditi H. Manajan , Mayuri B. Surve& Pramod R. Sona wane explained that to implement this approach we have used Arduino UNO as a controller to

control the motor operation during the whole process. We have used IR receiver to move duster and curtains in reverse and forward direction. A motor driver is used to supply 12v power supply to run the motor when it receives high at input through the remote button press. When any button is pressed by the user from remote it transmits a particulate button which is then received by IR sensor TSOP1738 connected to an Arduino [4].

Amit (2015) discussed a board erasing machine that relied on belt drive mechanisms and manual switches, requiring the teacher to be physically present at the board to initiate the erasing process. This approach was found to be inconvenient.[5]

Vivek et al. (2015) emphasized the wasted time during manual board erasing and suggested that this time could be better utilized for teaching or attendance. They proposed a system that would automate the erasing process by interfacing the mechanical erasing system with microcontrollers.[6]

Sathosh et al. (2016) introduced a duster with a track design that allowed it to move along the side of the board. A chain connected to the duster was driven by a motor to facilitate its movement. This innovation aimed to simplify and improve the board cleaning process.

Gaurav (2016) presented a device for automatic blackboard erasing, incorporating a duster mounted for longitudinal movement on the board. An engine connected to a drive assembly enabled the duster's movement, utilizing a rack and pinion system to convert motor rotation into linear motion. [7]

The electric board cleaner and the automatic whiteboard cleaner make use of belts. Most belts have low wear and tear resistance and with the frequent operation of the duster (i.e. the cleaning process), the belt is likely to cut and hence makes the device or the cleaner-less useful. In the process of trying to change the belt, the whole components may have to be loosened which is time-consuming. However, as for the case of the electric board cleaner, the idea of applying manual effort still comes in. The difference being that effort applied is less since it is powered electrically.

This project is aimed at modifying the automatic whiteboard cleaner by replacing the belts with chains which will improve the efficiency and effectiveness of the cleaner. The objective of this project is to reduce the stress of cleaning the board by using an automated duster. This objective would be achieved through the following specific objectives

i) Conceptualization of an automated whiteboard cleaner

ii) Preliminary and detailed design of new mechanism

III) Fabrication of the preliminary design of an automated white board cleaner automated whiteboard cleaner.

IV) Performance testing of the automated whiteboard cleaner.

CHAPTER 3
HARDWARE AND SOFTWARE ANALYSIS

3.1 12V DC 14-pin relay LM4C-BL

An electrical switch that runs on a 12-volt direct current (DC) signal is called a 12V DC 14-pin relay. It includes fourteen pins for various purposes, including control, ground, and power supply. Numerous applications, such as industrial control and automotive systems, frequently use this kind of relay. Because of its configuration, it can transition between the forward and reverse modes to regulate the direction of a motor or other devices. The design of the relay determines the precise purpose of each pin; users should consult the datasheet for more details.

Specification

The specifications of a 12V DC 14-pin relay can vary depending on the manufacturer and the specific model. However, here are some common specifications that you might find for such a relay:

- **Voltage Rating:**

Typically designed to operate with a 12-volt direct current (DC) power supply.

- **Contact Configuration:**

May have a Double Pole Double Throw (DPDT) configuration, providing two sets of contacts for flexible switching between two circuits.

- **Contact Rating:**

Specifies the maximum current and voltage that the relay contacts can handle. For example, it might be rated for 10A at 12V DC.

- **Coil Voltage:**

Indicates the voltage required to energize the relay coil and activate the switch. In this case, it would be 12V DC.

- **Number of Pins:**

Specifies the number of pins on the relay. In this case, it's a 14-pin relay.

- **Contact Material:**

Specifies the material used for the relay contacts, which affects the relay's durability and ability to handle different loads.

- **Switching Time:**

Indicates the time it takes for the relay to change state once the control signal is applied.

- **Life Cycle:**

Specifies the expected number of operations (open and close cycles) that the relay can perform before potential degradation.

- **Mounting Style:**

Indicates the method for mounting the relay, such as through-hole mounting or surface mounting.

- **Operating Temperature Range:**

Specifies the temperature range within which the relay can reliably operate.

Figure 3.1: 12V DC 14-pin relay LM4C-BL

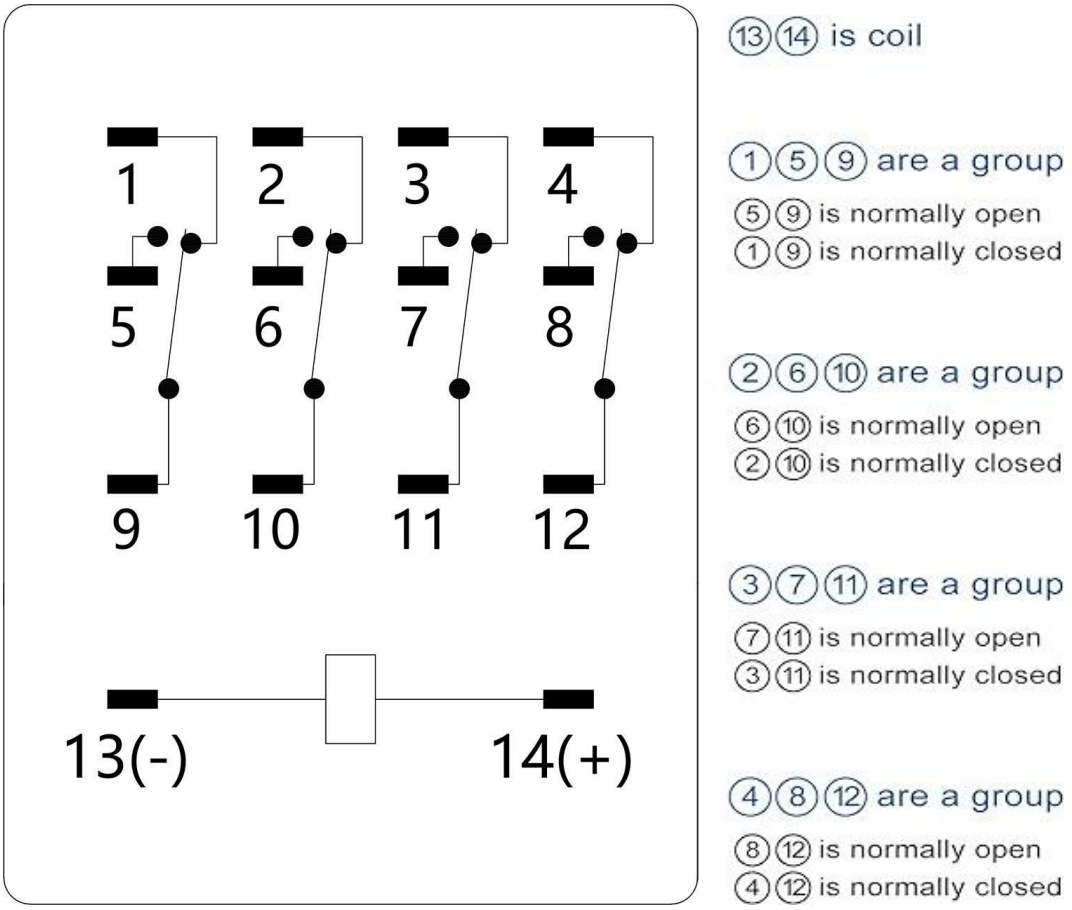

Figure 3.2: 12V DC 14-pin relay Pin Out [8]

3.2 SMPS

A switched-mode power supply (SMPS) is an electronic power source that uses a switching regulator to efficiently convert electrical power. It transforms power from a DC or AC source (often mains power) into DC for devices like computers. Unlike linear supplies, SMPS frequently switches between low-dissipation states, minimizing energy waste. It achieves voltage regulation by adjusting on-to-off time ratios, while linear supplies dissipate power in the pass transistor. SMPS offers greater efficiency, smaller size, and reduced weight due to smaller transformers.

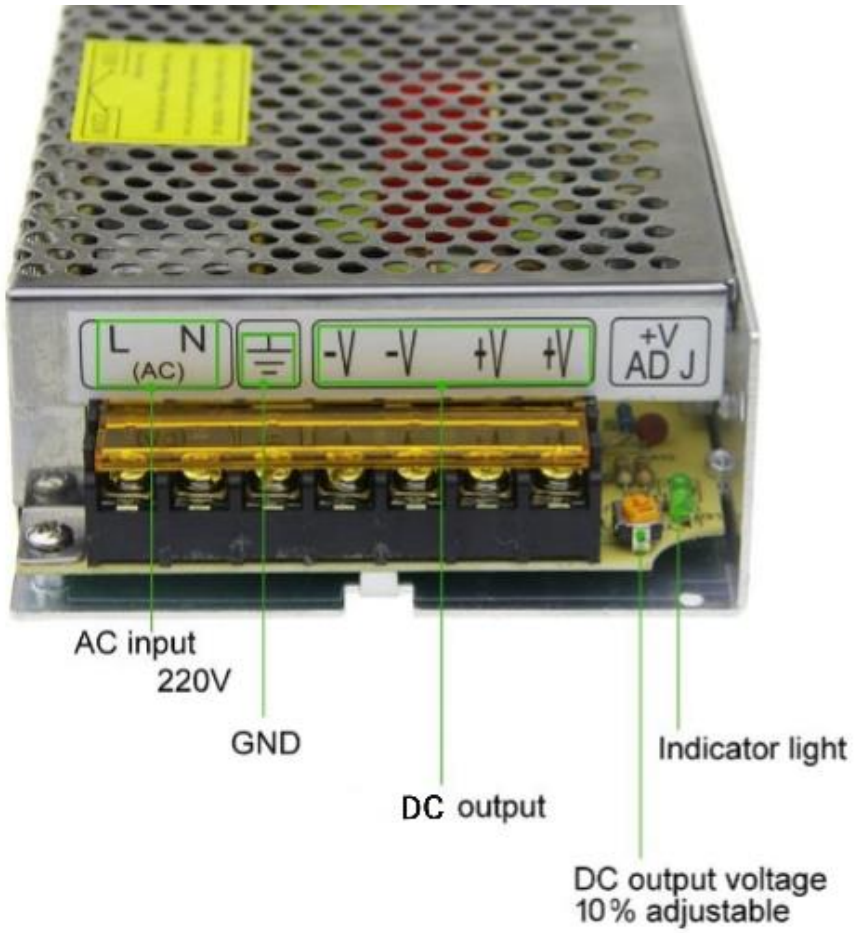

Figure 3.3: SMPS 12V 20A [9]

Switching regulators are used as replacements for linear regulators when higher efficiency, smaller size or lighter weight are required. They are, however, more complicated; their switching currents can cause electrical noise problems if not carefully suppressed, and simple designs may have a poor power factor.

Switched-mode power supplies are classified according to the type of input and output voltages. The four major categories are:

- AC to DC
- DC to DC
- DC to AC
- AC to AC

A basic isolated AC to DC switched-mode power supply consists of:

- Input rectifier and filter
- Inverter consisting of switching devices such as MOSFETs
- Transformer
- Output rectifier and filter
- Feedback and control circuit

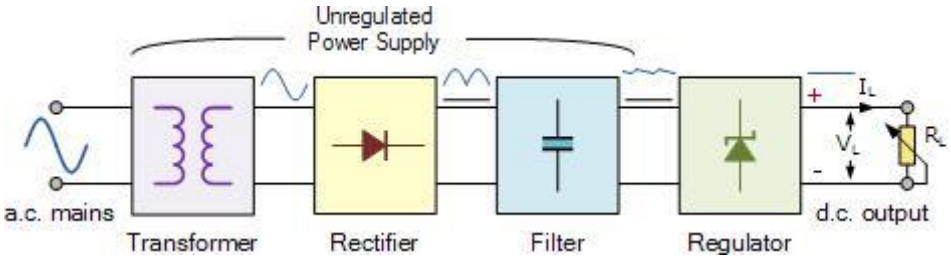

Figure 3.4: DC Power supply way

These typical power supply designs contain a large mains transformer (which also provides isolation between the input and output) and a dissipative series regulator circuit. The regulator circuit could consist of a single zener diode or a three-terminal linear series regulator to produce the required output voltage. The advantage of a linear regulator is that the power supply circuit only needs an input capacitor, output capacitor and some feedback resistors to set the output voltage.

3.3 Limit switches

An electro-mechanical device called a limit switch is used to transmit an electrical signal in response to a physical contact. Limit switches are used to sense the presence of things and trigger the appropriate action on the system. [10]

Limit switches are present in several commonplace devices, including:

- In microwaves, they are used to verify that the door is closed before powering on.

• They alert the mechanism when the cabin has arrived at the designated floor in elevators.

• Washing machine lids employ limit switches as a permissive to initiate the wash cycle.

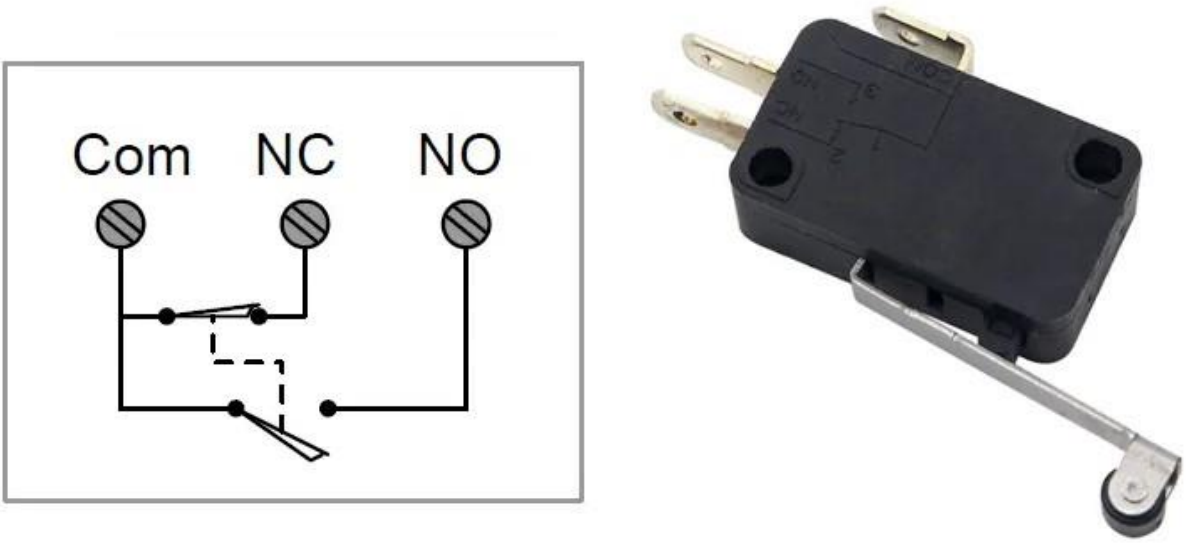

Figure 3.5: Limit switches T125

Working Process:

An actuator is mechanically connected to an electrical switch to form an electromechanical device known as a limit switch. Depending on the kind of limit switch, when an object moves the actuator, the electrical switch opens or closes.

Limit switches come in two primary varieties: normally closed (NC) and ordinarily open (NO). When the actuator is not triggered, a NO limit switch is open; when it is, it shuts. When the actuator is not actuated, an NC limit switch is closed; when it is, it opens.

Applications

Limit switches are frequently used to count objects or materials such that the switch will either open or close when the limit is reached. In industrial applications like assembly lines, this circumstance is commonly present. For instance, a limit switch in a particular piece of equipment will move the actuator, which will move the equipment away and transfer the product on to the next station, when the switch senses that the product has been added to a predefined number of components.

When a certain point is reached, limit switches can also be utilized as safety interlocks to stop machine parts from moving any further. An automated garage door is a perfect illustration of this. If there isn't a limit switch to shut the door when If the door hits the bottom rail, it will continue to slide downward and eventually collapse into the ground, doing significant damage.

Limit switches can also be incorporated into more complex control systems. The actuator can deactivate or activate a device to stop malfunctions or emergencies when a predetermined limit is reached.

3.4 DC Gear Motor

A DC motor is any motor within a class of electrical machines whereby direct current electrical power is converted into mechanical power. A 12v DC motor is small and inexpensive, yet powerful enough to be used for many applications.

Specification:

- Voltage: 12V DC
- Gear ratio: 1/31
- No-load speed: 200 RPM
- Rated Speed: 140 RPM
- Rated torque: 10 kg.cm
- Rated current: 2.5 Amp
- Length of Motor (including spindle): 106 mm/4.17″
- Shaft diameter: 6 mm/0.24″

Figure 3.6: DC Gear Motor [11]

3.5 Chain Drive

A mechanical power transmission device called a chain drive moves power from one location to another using chains. The chain itself and two or more sprockets make up a traditional chain drive. The sprocket teeth are fitted over the openings in the chain links.

The chain that is wound around the shaft's sprocket rotates along with the prime mover. By exerting mechanical force on the driven shaft, this transfers mechanical power.

Because of its zero slip feature, a chain drive has several advantages over a belt drive, one of which is the ability to maintain a consistent speed ratio. Because there is no lag in power transfer, it can be used in applications like internal combustion engines as a timing chain. High mechanical efficiency is further ensured by the absence of slippage. Friction between the chain links and the sprocket is the only source of loss in a chain drive.

When it comes to operating distances, chain drives are far more flexible than gears. When shafts are separated at distances greater than those at which gears are feasible, they become relevant. Chain drives maintain a relatively compact setup and are effective over a range of distances. Both short-distance devices like bicycles and long-distance devices like five-story-tall marine engines use them. Several shafts can be powered simultaneously by a single chain.

Figure 3.7: Chain Drive

3.6 Capacitor

A capacitor is an essential electronic component designed to store electrical energy temporarily in an electrostatic field. Its fundamental structure comprises two conductive plates, typically made of metal, separated by an insulating material known as a dielectric. When a voltage is applied across these plates, electrons accumulate on one plate, creating a negative charge, while the other plate becomes positively charged. This charge separation allows the capacitor to store electrical energy, which can later be discharged as needed. Capacitors serve various crucial functions in electronic circuits, including smoothing voltage fluctuations, filtering signals, and storing energy in applications such as power supplies, timing circuits, and noise reduction. They exist in multiple types, such aselectrolytic, ceramic, and tantalum capacitors, each tailored for specific electronic applications due to their distinct characteristics and capabilities.

Figure 3.8: Capacitor

An ideal capacitor is characterized by a single constant value for its capacitance. Capacitance is expressed as the ratio of the electric charge (Q) on each conductor to the potential Difference (V). The SI unit of capacitance is the farad (F), which is equal to one

coulomb per volt (1 C/V). Typical capacitance values range from about 1 pF (10−12 F) to about 1 mF (10−3 F).

3.7 Resistor

A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. Resistors act to reduce current flow, and, at the sometime, act to lower voltage levels within circuits. Resistors may have fixed resistances or variable resistances, such as those founding thermostats, visitors, trimmers, photo resistors, hamsters and potentiometer. The current through a resistor is in direct proportion to the voltage across the resistor's terminals. This relationship is represented by Ohm's law.

Figure 3.9: Resistor

CHAPTER 4
METHODOLOGY

4.1 Methodologies for the project

Our methodologies for the project:

- Creating an idea for Automatic Whiteboard Cleaner.
- And designing a block diagram & circuit diagram to know which components need to construct it.
- Collecting the all components and programming for the micro controller to controlled the system.
- Setting all components in a PCB board & soldering. Then assembling the all block in a board and finally run the system & checking.

4.2 Block Diagram

Block diagram is a diagram where all equipment's are organized by block. This is a primary diagram of our system. Here we use Relay LM4C-BL, SMPS, DC Gear Motor, Limit switches. Here we also use various instrument which is visible in this block diagram-

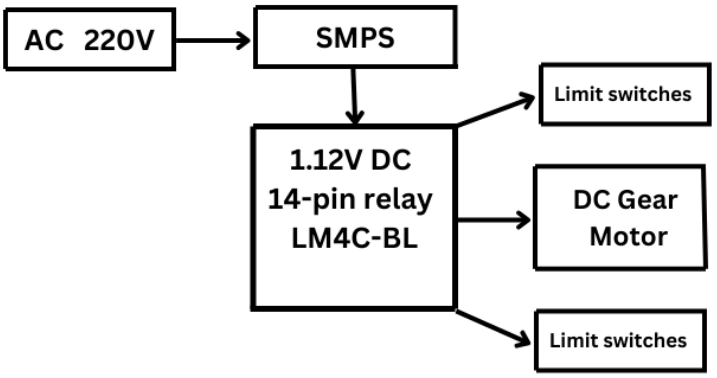

Figure 4.1: Block Diagram of System

4.3 Schematic Diagram

The schematic diagram here is representing the electrical circuit and the components of the project. Here we have used standardized symbols and lines.

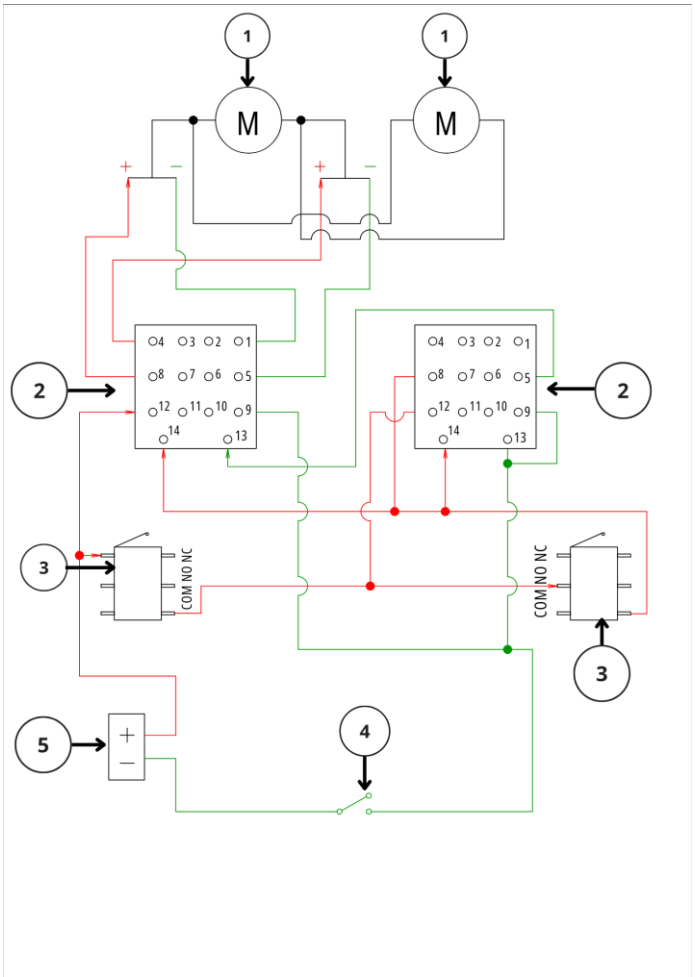

Figure 4.2: Schematic Diagram of the Project

1. DC Gear Motor
2. 12V DC 14-pin relay LM4C-BL
3. Limit switches T125
4. Power ON/OFF Switches
5. SMPS 12V 20A

4.4 Working Principle

We begin by taking 220V AC power from the source and use an SMPS module to convert it into a stable 12V DC supply. This power source runs the 12V DC 14 pin Relay LM4C-BL and other components. The 12V DC 14 pin Relay LM4C-BL manages the motor, Limit switches, and controls the cleaning process. The Limit switches precisely guide the Relay and the Relay command the DC Gear Motor's direction within driving the cleaning mechanism based on required torque and speed. When the lower limit switch directs the relay, the motor rotates clockwise while the upper limit switch directs the relay, the motor rotated anticlockwise and stop the switch the cleaning process is end, and that is the key feature of our working system or machinimas.

4.5 Final System View

Figure 4.3: Our Final System of Front View

Figure 4.4: Our Final System of Side View

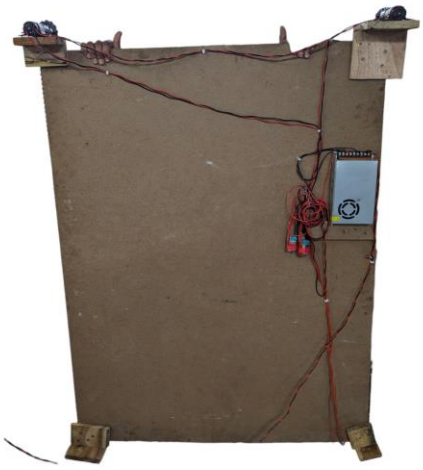

Figure 4.5:Final System of Back Side View

CHAPTER 5

CALCULATION AND DATA TABLE

5.1 CALCULATION

For the purpose of design, the following calculations has been carried out. Which is not exactly matching with the actual performance

DC geared motor: Voltage=12 V, Load current(I)=20 Amp, Speed(N)=100 RPM, Torque=10 kg-cm(98.1 N-cm), Power=240 Watt . Mass of duster (m)= 1.8 kg, Radius of pully = .025m

$$Forces\ acting: \frac{Power}{Velocity}$$

i) Tangential force (Ft):

$$Velocity = \frac{Angular\ velocity}{Radius}$$

$$Angular\ velocity\ (\omega) = \frac{2\pi N}{60} = \frac{2\pi \times 100}{60} = 10.47\ rad/s$$

$$Velocity = \omega r = 10.47 \times .025 = 0.261\ m/s$$

$$F_t = \frac{240}{0.261} = 919.57\ N$$

ii) Radial force (Fr):

$$Fr = m\frac{V^2}{r} = 1.8\frac{0.261^2}{.025} = 4.90\ N$$

iii) Resultant force (F):

$$\sqrt{Ft^2 + Fr^2} = 919.57\ N$$

iv) Actual force with friction: $\mu \times F = 0.43 \times 919.57 = 395.42$ N-cm
($\mu = 0.43$)

v) Time required to clean the board:

$$t = \frac{length\ of\ board}{velocity} = \frac{1.2192}{0.261} = 4.322\ second \approx 5\ second$$

5.2 Data Table

Table 5.1. Time required using different speed by Automatic white board cleaner

Sl. No	Speed (RPM)	Velocity (m/s)	Length (m)	Time required to Clean (Second)
1	120	0.314	1.2192	3.88
2	110	0.287	1.2192	4.24
3	100	0.261	1.2192	4.322
4	90	0.235		5.18
5	80	0.201	1.2192	6.06
6	70	0.183	1.2192	6.66
7	60	0.155	1.2192	7.86
8	50	0.130	1.2192	9.38
9	40	0.104	1.2192	11.72
10	30	0.078	1.2192	15.63

CHAPTER 6

RESULT AND DISCUSSION

6.1 Results and Discussions

By the use of Smart Cleaner Duster, we can save time and energy as no manpower need to clean the whiteboard manually. The teachers waste time in erasing the whiteboard in classroom as the previous board has no automatic cleaning function.

Table 6.1. Time taken for Manual Whiteboard Cleaning and using Automatic Cleaner Reading Time (second)

	Manual Whiteboard (second)	***Automatic Cleaner(second)***
1	9.50	4.322
2	11.90	6.02
3	12.89	7.86
Average	**11.43**	**6.08**

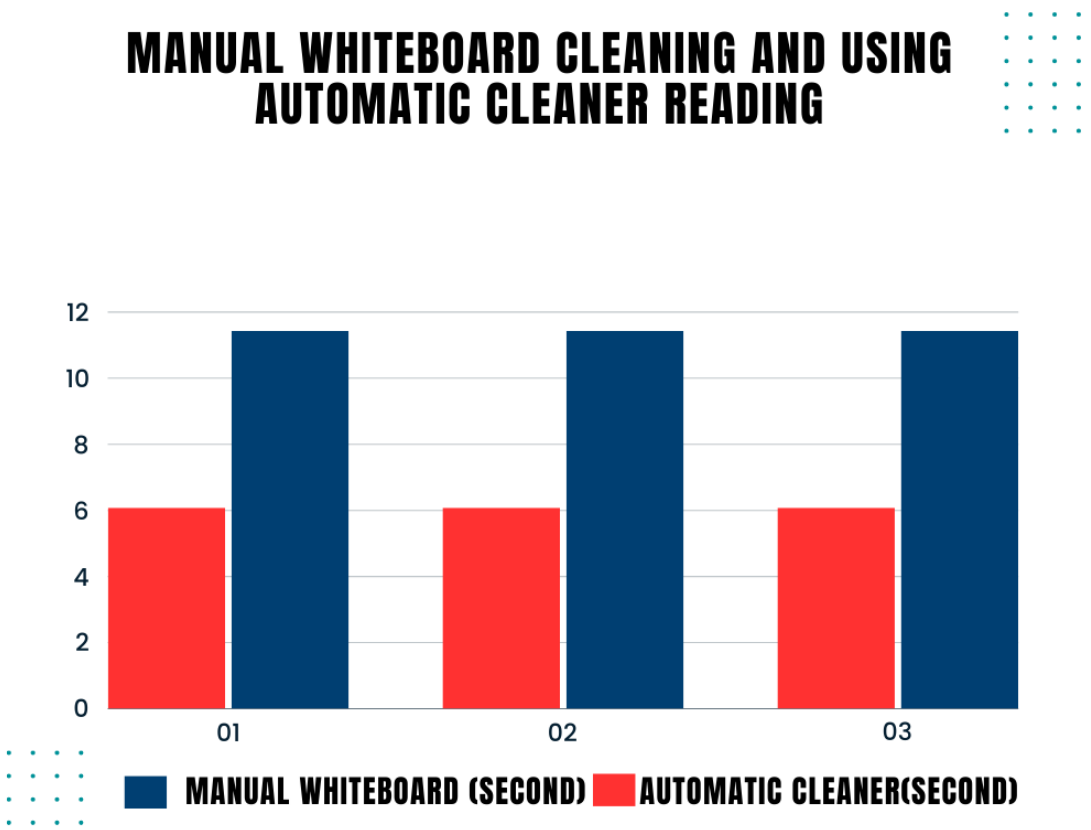

Figure 6.1. Graph time comparison between manual whiteboard cleaning and using Automatic Cleaner

Refer to figure 6.1, the graph shows time comparison between manual whiteboard cleaning and using Smart Cleaner Duster. Finding shows that manual duster cleaning completed after 8.80 seconds while Smart Whiteboard Cleaner only takes 4.46 seconds. This makes Smart Whiteboard Cleaner worth to use as it can save time. Furthermore, the structure of Smart Whiteboard Cleaner is simple, offer a solution of cleaning within time saving and it can provide convenient ways of use.

6.2 Advantage

There are many advantages of our project because of its accuracy. Some of the advantages are pointed out below:

- Automatic Cleaning System.
- Production cost is very low.
- No need of purchase special machine.
- Its operated and maintenance is simple
- It is compact and portable.

6.3 Application

Some of the application areas of the project have been pointed out below:

- It is used Classrooms and Educational Institutions.
- This machine is used in Business and Meeting Rooms.
- Homes and Home Offices.
- Hospitals and Healthcare Facilities.
- Public Spaces

CHAPTER 7
CONCLUSION

7.1 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 to do their job by using the robot or machine. That is why development of machine and robot is now becomes quite popular and faster in marketing. So to help and give benefit to human kind the DESIGN AND FABRICATION AN WHITEBOARD CLEANER is an alternative machine that can help lecturer, teacher and student to keep their board clean by using this machine.

7.2 Future Scope

In the present time not everything is automatic but seeing towards progress of present technologies, In future everything will be operated automatically. So this project 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 Design and Development of Board Cleaning System. In future if this project is taken to the next stage then for collecting the dust from duster a vacuum blower can be arranged.

1) Operate in schedule – this machine can be set up the time. It can operate automatically when we set up the time we want it work.
2) Eye of machine – we can make this machine operate with detection of dirty in whiteboard. Machine knows the location of dirty and erases it automatically.

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