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Preliminary Study and Use of Design of Dusto Cleaner for Black Board

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Abstract - Even if we lead to the digital platform traditional chalk and board is an integral part of the education life. Blackboards and chalk pieces are used in almost every educational field in the world. Cleaning the board using a duster is essential for continuing the writing process and this involves rubbing a sponge surface against the board surface. This cleans the board but also creates a fine dispersion and particles of chalk powder around the atmosphere nearer the board, which is certain to be inhaled by the teachers, and in many cases, students who occupy seats near the blackboard suffer some inhalation problems. The work also stated that teachers were at the maximum risk of inhaling the chalk dust and may suffer from respiratory diseases.

***Key Words*:** Blackboard, chalk, duster, respiratory, diseases

1. INTRODUCTION

Being a part of society, education is one of the most important parts of everyone's life. Even if we lead to the digital platform traditional chalk and board is an integral part of the education life. Blackboards and chalk are used in almost every educational field in the world. When we enter in education field blackboards and chalk pieces are an indispensable part of a classroom, no matter how advanced our classrooms have become.

Blackboards are the backbone of the classroom for effective teaching and learning purposes where chalk pieces are used to write on the board. These chalk particles are a soft, form of limestone that produces chalk dust which leads to many health issues for humans and produces harmful effects on the equipment in the classroom.

It includes irritation and allergies to skin, tissues, and eyes and during inhaling it leads to problems related to the respiratory system. This modern duster will allow students to develop in a healthy atmosphere. Being a backbone of a student's educational life various measures to avoid any health issues should be taken.

2. PROBLEM STATEMENT

The Blackboard erasing system intends that it can minimum the problems with chalk powder, such as breathing problems and eye irritation.

It causes discomfort to students who sit on the first benches or very close to the blackboard as these fine particles of the chalk can enter into the air tract which may cause severe lung problems or may even lead to chronic respiratory problems. To make a duster that will clean the surface of the board and collect the chalk powder with the help of a suction motor or which works on the principle of a vacuum cleaner that will absorb the particles.

3. OBJECTIVES

1. To make a duster that will clean the surface of the board and collect the chalk powder with the help of a suction motor or which works on the principle of a vacuum cleaner that will absorb the chalk powder, which will reduce the problem of inhaling chalk powder by students and teachers
2. To minimize respiratory diseases and can also avoid the chalk powder from going into the eyes. Creating a dust-free environment for students.
3. To protect students, teachers, and other field staff exposed to this chalk dust. Chalk dust sticks to the trachea of humans resulting in serious health diseases like cancer.
4. This duster will provide a high amount of security in terms of health issues in the teaching field. Our modern Board cleaner consists of a lesser amount of space, and weight and a higher amount of chalk dust absorption properties.
5. The powder collected in storage containers can be used to make new chalks hence resulting in less pollution created while the production of chalks on a large scale.

4. PROJECT OVERVIEW

The purpose of research work is to keep the teacher or student present near the board and also away from the board while it is being erased, to reduce the inhalation of chalk dust particles that are suspended in the air around the board while it is erased. The maximum concentration of dispersion occurs while the board is rubbed. That's why it makes good sense to try the blackboard cleaning operation. Being a part of society, education is one of the most important parts of everyone's life. When we enter in education field blackboards and chalk pieces are an indispensable part of a classroom, no matter how advanced our classrooms have become.

Cleaning the board with a duster generates a fine suspension of chalk dust in the zone of the board, which is constantly

inhaled by the teacher as well as the students near the board. Though this doesn't appear serious, prolonged inhalation will result in breathing trouble. Therefore, automation of the board erasing process is tried along with a mechanism for suction kit, which suppresses the scattering of chalk dust particles in air. It is planned to install the smart duster in our college class rooms on a step by step basis.

5. EXPERIMENTAL SET-UP

The Experimental setup consists of the following main components,
1)**Container:** this is the part where the chalk dust will be stored which is sucked with the help of a motor.
2)**Motor:** This motor will help the fan for revolution and hence this will cause the gathering of the chalk dust.
3)**Fan:** Will revolution of the fan's blades will cause an opposite flow of air i.e., suction.
4)**12V battery:** This will help to give power to the motor so that the fan can move and collect the chalk dust.
5)**The duster case:** This will be made up of plastic/lightweight wood and it will be compact at the top it will have a handle so that the user can hold it properly.

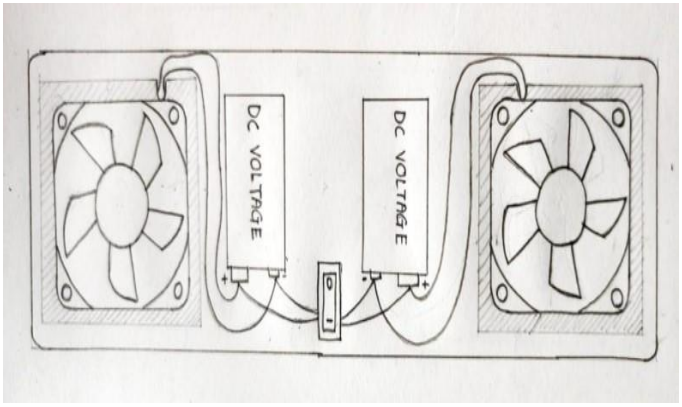

Fig -1: Modeling of Dusto-cleaner (Line View)

We have connected a centrifugal fan which is connected to a battery or DC supply. There are holes in the duster which are projected outwards on the side surface of the duster. All the holes are then connected with the help of a pipe to the inlet of the centrifugal fan. This fan when turned on will create a suction and suck the air inside it and along with it, all the chalk powder will get sucked inside the centrifugal fan. Further, the outlet is connected to a container that will collect all the chalk powder and store it which can be further removed by removing and cleaning the container.

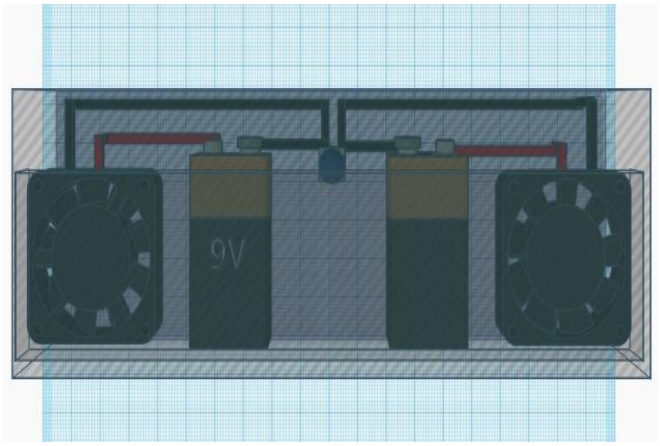

Fig -2: Modeling of Dusto-cleaner (Top View)

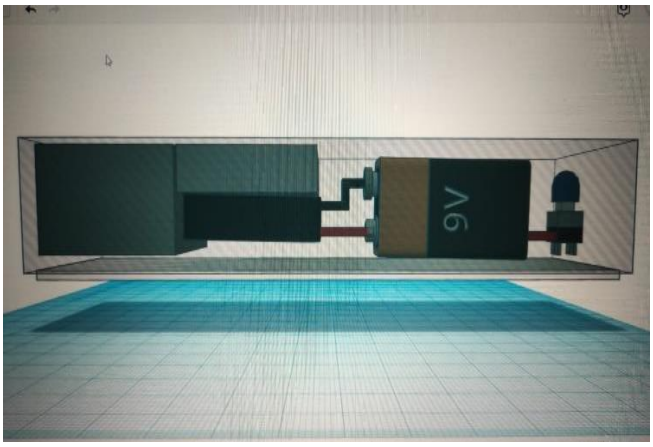

Fig -3: Modeling of Dusto-cleaner (Front View)

4. CONCLUSION

The smart duster will make teachers' lives easier as it absorbs the dust particles emitted by dusting the whiteboard. Every duster should be replaced by a smart duster as it will prevent harmful particles from being inhaled by the teacher and causing diseases. According to a survey, swallowing a piece of white chalkboard chalk will not kill you, but breathing in chalk dust for several years can trigger respiratory problems. The smart duster is effective in the board cleaning process, saving effort and time. The smart duster was designed by using low-cost material so the price of the system is less.

5. FUTURE SCOPE

Though there are smart boards introduced in cities many villages still now use blackboards and they are not going to vanish from classrooms as they are the source of interactive classrooms. So this duster can be widely used to prevent health disorders for the teachers as well as the students sitting on the front benches.

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BIOGRAPHIES

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