

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 4, April 2019

A Design and Development of Foot Wear Cleaning System

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ABSTRACT: The employee of companies, customers visiting the malls, shops etc want their floor clean and neat. Hygiene and cleanliness is most important parameter. In this paper the difficulty of cleaning foot wear has been suggested. The main aim of paper is to design automatic foot wear cleaning machine. This machine help in reducing the difficulty of existing product available in the market at the same time enhance the cleanliness and to maintain hygiene of the floor in offices, institution etc. The automatic shoe cleaning machine has been designed considering all the requirement and need of users. It is adjustable which makes a person to bring its best feet forward. Each and every person thinks that their shoe should be clean and shiny. Taking all these into account we have designed this product which reduces the burden of manual operation at the same time increases the use of modern techniques. This paper is to provide an apparatus for cleaning foot wears which overcome the problem encountered in the conventional one. It obtains a desired shoe cleaning effect greater which in turn make the floor clean.

KEYWORDS: Foot Wear Cleaning System.

I. INTRODUCTION

There is a famous proverb "*Cleanliness is next to godliness*". The machine which we have designed and fabricated implicates this, called as "Foot Wear Cleaning System", here the shoes sole can be cleaned in much less time with no effort. Most of the industries, hospitals and educational institutions having the most preserved laboratories like computer labs, instrumentation labs operational theatre and various production, assembly sites in chemical, pharmaceutical industries etc, have to be free from dust and dirt which would be carried through the shoe of the employees to the work area, causing untidy environment and also sometimes hazardous to the working environment.

The shoe cleaning machine is utilized to clean your shoe inside a short interim of time which diminishes human quality and exertion. All workforce need that their shoes should give an alluring look also, much better dependable however neglect to pursue the means that required, subsequently reminding all these challenges we have built up this machine which give your shoes wanted look ordinarily with very great sparkle. The presentation of this machine helps in effective work by joining the cleaning and cleaning at one spot. It lessens the human exertion. This machine is convenient and prudent it not just finishes the need yet additionally includes another way of life for the personnel who consistently utilize the shoe. There are so numerous these sorts of machine exists however a created strategy for making makes the clients to use at the equivalent time a needs of the clients never closes. Still further adjustment should be possible in this sort.

"Neatness is alongside purity" is a renowned axiom which says tidiness is the best approach to purity and without neatness we can't get righteousness. Today, the vast majority work in enterprises, medical clinics, air terminal, gathering on the concoction side, IT organizations and so on., so they should wear shoes. When the individual leaves his home into the outside condition which is exceptionally dirtied, dust particles get stored on the shoe. The individual thinks that its hard to clean the shoe each time it gets grimy. Likewise, in manual cleaning of the shoes, if the wire of the brushes is excessively hard and if the cleaner handles it without consideration, it might harm the cowhide of the shoe and diminishes its life.

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As prime significance given to the shoe determination these days, its support is likewise being taken consideration and in a few locales or zones clean condition is favored, subsequently cleaning of shoe, upper and lower some portion of it and furthermore to have an exquisite look to the human, cleaning of the shoe is essential, considering every one of these variables wide scope of machines for shoe sole cleaning machine and shoe cleaning machine has been developed from the before hundreds of years and furthermore the venture presents an assortment of ideas of the item and aides in choosing a superior model for shoe sole cleaning and shoe cleaning machine.

II. LITERATURE REVIEW

[1] The paper presented by Sreenivas & Gouda were worked on “design of shoe and sole cleaning with polishing machine” in which they were proposed to design a shoe sole cleaning machine, incorporating shoe polishing facility with this machine. As all the employees, faculty etc required wearing clean shoes before entering their laboratories, as these laboratories have highly precise instruments, sensors etc and the air inside should be very clean. That sole cleaner with shoe polishing machine is designed, to considering all the parameters with respect to customer need and requirement in terms portability and also economically available to them, thus providing not only clean environment but also provide the style quotient to the person with polishing effect. Also they were explained about “concept development process” it was sequence of steps or activities which an enterprise employs to conceive, design, and commercialize a product. Many of these steps and activities are intellectual and organizational rather than physical. Some organizations define and follow a precise and development process, while other may not even be able to describe the processes. Furthermore, every organization employs a process at least slightly different from that of every other organization. Also the same enterprises may follow different processes for each of several different types of development projects.

[2] The paper presented by Animesh et al., were design a coin operated shoe polishing machine. The entire faculty employee wants to a shoe which is clean. This machine help in reducing the difficulty of existing product available in the market at the same time increase the use of this product in offices, institution etc. The coin operated shoe polishing machine has been designed considering all the requirement and need of users. It has a sensing device which sense the coin depending on that it start working. It is portable and adjustable which makes a person to bring its best feet forward. The problem which arises in the manual operation has been reduced in this machine. Each and every person thinks that their shoe should be clean and shiny. Taking all these into account we have designed this product which reduces the burden of manual operation at the same time increases the use of modern techniques. During the design of this machine they had taken a consideration that it should be more efficient than manual operation and should reduce the difficulty exists in the conventional one. The machine uses a coin operated metal sensor for sensing, motor and shaft for rotation. That simple mechanism was only used for polishing the shoe. During the design they came through some difficulties that when the users are using this machine they have to give their body support because in one leg person can't stand. The next is that every time user has moved their feet back and forth which put some stress on person. If there is a case of coin operation machine then people are also using any metal in place of a coin since the device is a metal sensing device. Therefore a tremendous modification is required in this area of design which increase the advancement of the technology

[3] The paper presented by “Narayanan Rajeev” were design and develop an automatic shoe polishing machine, which could reduce the difficulties in existing products available in the market and at same time increase the use of the product in office. The main drawbacks in the existing product were, we have to move our shoe for total cleaning of it by foot, sole cleaning problem, and buffing area. The users also had problems of applying polish over the shoe and supporting the body while polishing. For designing the shoe polishing device, it was very important to understand the user's aspiration, suggestion and market segment. This was done by analyzing the data collected from literature review, and customer survey and market study. The model was modified according to the result from the analysis. A physical model of the selected concept was made to validate the design. Users could polish their shoes easily without any strain. User feedback was obtained on the new design of the shoe polishing device.

[4] The paper presented by D. Srihari et al., in this method, shoe polishing machine by using only single or specific coin based on sensor equipment method. The job of the sensors is to measure physical properties of the coins, such as dimensions like size, conductivity, magnetic permeability, elasticity, etc. There are many sensors used in polishing

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machine like optical sensors, impact sensors, positional sensors electromagnetic sensors, acoustic sensors which sensors can be used to coin recognition for automatic shoe polishing machine. The main drawbacks of the existing system have access only significant or particular coins. So we need to that particular coin on the spot. To overcome this, in that machine system can access by all Indian coin models. In this paper a novel method of coin based automatic shoe polishing machine using raspberry pi processor and open image processing tool [11] has been designed and developed. The main part of the coin recognition process is employed by installing open library into the raspberry pi processor [8]. Sift algorithm has detected the key points and extract key points finally; flann [12] algorithm provides matching key points. Hence this method provides all Indian coin.

III. OBJECTIVE

Main objective of this paper is maintaining floor cleanliness along with.

- To make process fast
- Convenient in use
- To clean floor better
- Reduce efforts required
- Reduce labour cost
- Reuse of water

IV. WORKING PRINCIPLE

When a person come and stand on the system, the system will start the roller which wills generate friction between sole of shoes and roller brush. Due to friction, the dust particles which have low bonding with the sole of shoes will get removed.

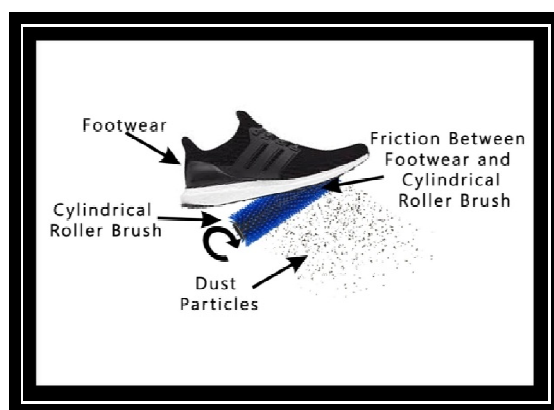


Fig. 1 Working Principle of Foot Wear Cleaning System

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V. BASIC DESIGN & WORKING

1. Basic Design: -

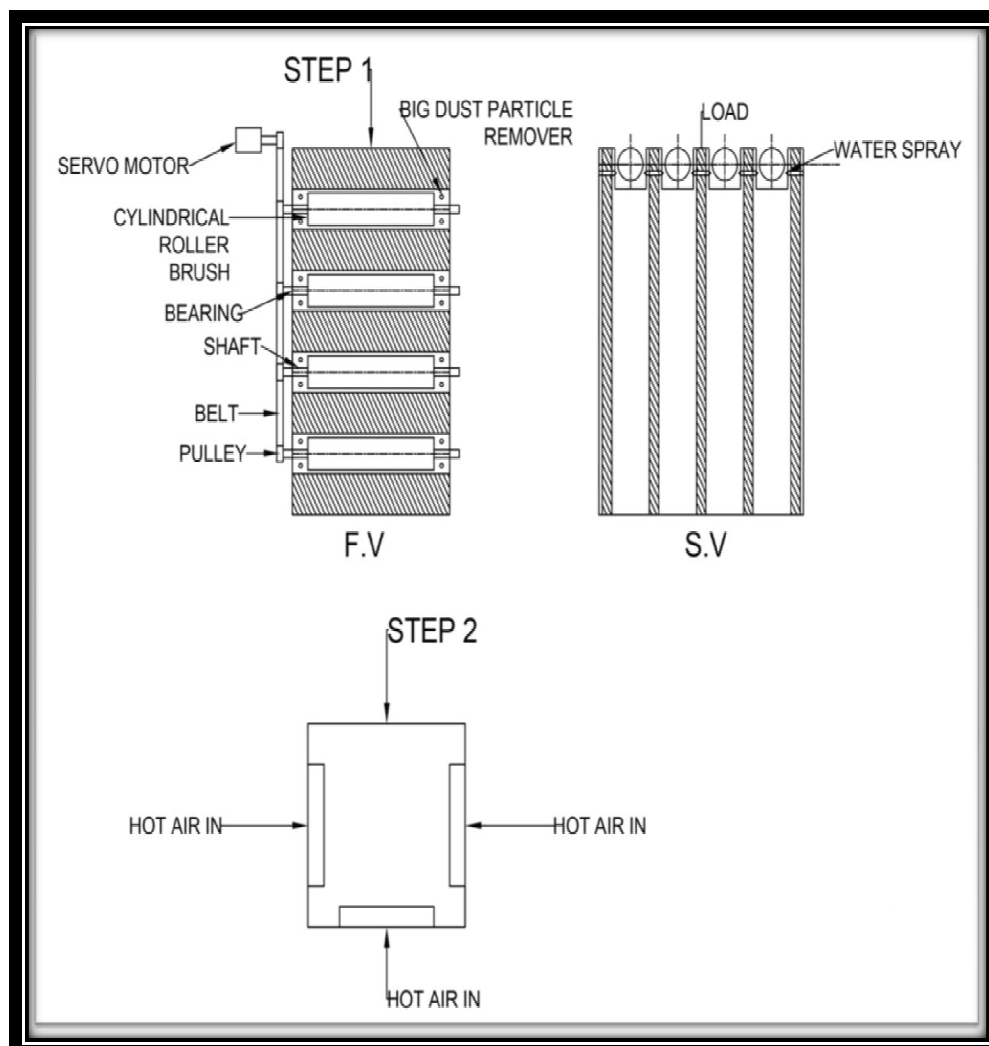


Fig. 2 Basic Design

2. Basic Concept and working: -

At entrance where frequency of visiting people is more the system can be placed in any organization. This system will take maximum 1.5 min for cleaning. This time will be compensating in the security checking & metal detector at the entrance.

Firstly, when any person come from the outside at that time the sensor will sense and then give command to electric motor to start. The shaft will be rotated with the help of mechanism of belt drive which connected with electric motor. At that time the roller brush which is connected to the shaft starts rotating. When the sole of shoes will touch the bristles of the roller brush it generates the relative motion between them and friction will produce. The friction which generate by roller brush at that moment water will sprayed by sprayer with the help of water pump. The bond of dust

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particle and sole will be break due to friction and sprayed water. The dust particle will be removed from the sole. The dust particle goes on secondary filtration system and then the heavy dust particles remains on the top and dirty water goes in the dirty water storage tank. From there it goes in the primary filtration system where the dirty water is filtered and it is again supplied to water storage tank..

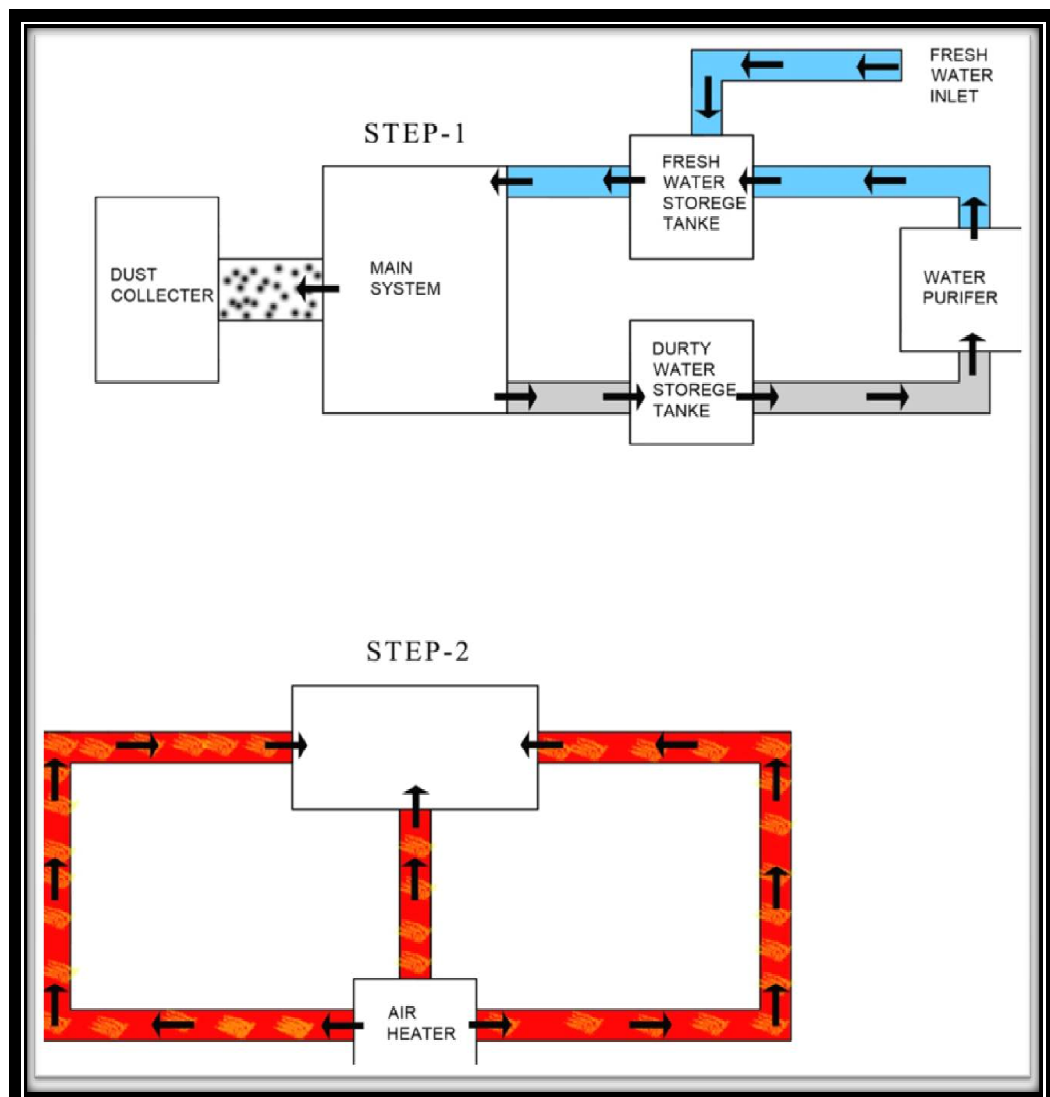


Fig.3 Basic Concept

In first stage only the bottom sole of shoes is cleaned but the moisture still remains on sole because of sprayed water. In second stage there is a drying system in which the moisture present's on the bottom of shoes get dry with the help of dryer.

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VI. CONCLUSION

By using our foot wear cleaning system, labour cost as well as effort is decrease for maintaining cleanliness of floor which means only one labour is required to operate this system so that we have to give less wages for labour work. It performs cleaning work speedily as compare to manual work so that we can save the time and this system also save the water.

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