Design and Fabrication of Floor Mopping Machine

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***Abstract*:- The purpose of this project is to clean the floors in colleges, hospitals, airports, auditoriums, malls and workshops. The aim of this project is to design and Fabricate of the machine for cleaning the floor having wet and dry surfaces. It is very useful for cleaning the wet as well as dry floors. Cleaning of floor is very important for our health and this floor cleaning machine reduces the effort required for cleaning. Hence this project is very useful in our day today life. It is very simple in construction and easy to operate, anybody can operate this machine easily. Floor cleaning machine consist of DC moto, AC to DC converter, Foam rolling brush, Foam wiper and sponge. The key technologies and processes are analysed and the existing dramatization and intelligence deficiencies are summarized. By drawing on the mature technology of developed countries, we find the core of the problem and indicate the development path for the automation and intelligent of cleaning machinery in India. This venture manages the outlining and manufacture of Floor Cleaning Machine. The point of this undertaking work is to create and modernized process for cleaning the floor with wet and dry. It can be utilized in wet and dry surface. Our main aim is to reduce the cost of current machine which is available in the market. So we have designed a new machine which is available at very low caste comparing with the other machines. Or machine use only very low power supply as input comparing with the other floor cleaning machine which is currently available in the market. It is less maintenance and easy to operate.**

1.INTRODUCTION

In our day today life cleaning plays an importand roll. Public places like airport, Railway station, hospitals, mall are cleaning frequently. Without cleaning there is a chance of spread in diseases. Usually cleaning use a positive thought about the place. Now a day Covid 19 a pandemic disease which forces to clean our surroundings frequently to avoid spreading of disease. There are many various types of cleaning machines or equipment on the market today for both commercial and residential use. This is a brief overview of the type, power sources and uses for floor cleaning equipment. For effective cleaning results of any floor or surface, there are four basic and simple principles to follow.

Cleaning of waste is a very important one for our health and reduces the man power requirement.

Effective cleaning and sanitizing helps and protect the health of the human beings directly and indirectly. Also, cleaning and sanitizing prevents the pest infestations by reducing residues that can attract and support bees, pests etc. It also improves the self life of the floor, walls etc due to regular cleaning and maintenance. In recent years, most of the people prefer to use trains or buses for commuting and hence these places are littered with biscuits covers, cold drink bottles etc. Hence, it is necessary to clean the bus stands and railways stations at regular interval. There is no one single cleaning method that is suitable cleaning technique and also the equipment should be user friendly. Cleaning work can be physically demanding and a need has been identified to developed methods for systematic ergonomics evaluation robots are getting more popular for busy and aging populations due to lack of workers. However in India, unemployment is more and hence there is a need to develop less labour oriented cleaning machine. Hence, the present work is aimed to design , development and evaluation of a manually operated floor cleaning machine. In recent years, conventional floor cleaning machines are most widely used in airports , railway stations, malls, hospitals and in many commercial places, as cleaning is one of the important parameter for the sanitation and government regulations . For maintaining such places, cleaning the floor is the major task which is necessary. There are conventional floor cleaning machines available to perform floor cleaning operations in above said places. Generally a conventional floor cleaning machines requires electrical energy for its operation. In India, especially in summer there is power crisis, in majority of places. Hence cleaning the floor using the conventional floor cleaning machines is difficult without electricity. In this project an effort has been made to develop a manually operated floor cleaning machine so that it can be an alternative for conventional floor cleaning machines during power crisis

2. PROBLEM STATEMENT

As we know the cleaning of floor is very importand. Some persons are little bit lazy and they want automatic cleaning machine. Some persons of operators who are operating the cleaning machines or careless while cleaning. They were not done the perfect cleaning in public place it gives a bad impression about our machine. Appearance of the machine maybe one of the disadvantages in attracting others while selling the product.

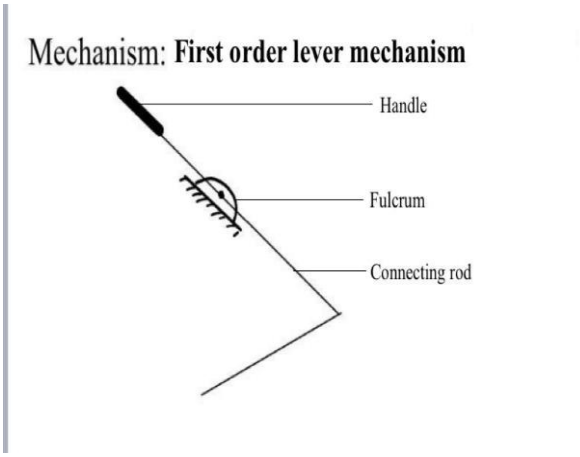
3. LITERATURE SURVEY

Traditionally floor is cleaned by hand using different handmade instruments. Initially it was being washed by different reed brushes. According to Egyptian houses were built of sundried mud bricks at times white-washed and the floors were stamped earth. The floor of the outdoor kitchen too was simply the ground baked stone hard by the sun. Unless it was raining, which happened only rarely,

these floors were easy to keep clean by sweeping. Like most ancient Egyptian tools, these brushes did not have long handles which would have rendered their use less irksome, and required bending low when employing them. For the ease of human beings different designs of brushes are evolved. Again during the age of monarchs carpets of different designs are utilized to cover the floor to keep it clean. As the time passed new scientific era begins a lot of new methods are used to clean the floor. The first among those was the reciprocating action of brush actuated by muscular force. The brush design is changed time to time depending upon the floor structure and ease of washing personnel. As the electricity came into role vacuum cleaner are invented to clean a dry surface. Moving forward different floor cleaning machines are being invented to clean the floor with less application of muscular power. Then came the concept of mobile robot. Mobile robots have the capability to move around in their environment and are not fixed to one physical location. By contrast, industrial robots are usually more-or-less stationary, consisting of a jointed arm (multi-linked manipulator) and gripper assembly (or end effector), attached to a fixed surface. 13 For the help of mankind the first floor cleaner was manufactured during 1980s. In those equipment the aim was to wash the floor with less power utilization. There sweeping mechanism of mop is actuated by a timing motor which was controlled by the dc circuit. Here water is sprinkled on the mop and hence the wet mop is used to clean the debris from the floor. But the problem here was it can't use any chemical solvent or disinfectant. Again for soaking purpose only hot air is used. Again for moving the machine a worker has to be engaged. To overcome these conflicts current study was done to enable the cleaner move automatically throughout any kind of room. The moping mechanism is also modified to lessen the cost. In current study the mop is continuously revolving about a axis perpendicular to the motion of the cleaner which also helps in directing water on the floor backward. Instead of using a wet mop a sprinkle mechanism is used to make the floor wet which is scrubbed by the mop. A vacuum cleaner was used to soak dirty water from the floor surface and side by side cleaning the surface. For automatic motion of the cleaner mobile robotics is used. Mobile robots are a major focus of current research and almost every major university has one or more labs that focus on mobile robot research. Mobile robots are also found in industrial, military and security settings. Domestic robots are consumer products, including entertainment robots and those that perform certain household tasks such as vacuuming or gardening. From then on more sophisticated robot is designed for household equipment for automating the tasks including washing machine, micro woven. After that only the revolution of mobile robotics came to household usages. The problem with current automatic floor cleaning machines are they are only used in households for only dry and wet cleaning but not as infection remover. So it is only used in households and not in hospitals or small areas in public. The automatic floor mops like hydrobot are bulky and they also require large power and are used for commercial purpose. But we think this (Our cleaner) will solve all in one go... We will basically focus on a smart and smaller and good designed robot which can be used in many sectors like healthcare and educational areas (which are of course small areas) and also for household use. So it will be both for terminal cleaning like medicals and indoor floor cleaning.in future we will focus on indoor air cleaning service as an additional feature to this machine.

4.1.DESIGN OF FLOOR MOPPING MACHINE.

In this machine the first order lever mechanism is used First-order levers are mechanisms with the fulcrum placed between the input force and the output force. Think of a see-saw. In this case the input and output forces are equidistant from the fulcrum (meaning the output force will equal the input force less losses from friction).



4.2.SYSTEM DESIGN INPUTS

Scrubbing with	510mm
Total with	730mm
Total length	1110mm
Total high	840mm
Weight without water	45kg
Weight with water	47kg
Ground clearance	20mm
Handle length	500mm
Scrubber length	510mm
Wiper length	600mm
Wiper Oscillation length	250mm
Volume of Mud water dray	1.5litter

4. FABRICATION MODEL

Fig 1 Fabrication model

5. WORKING PRINCIPLE

The project is fully unified for cleaning application. It features the requirements needed for floor cleaning such as water supply, scrub and fan. It is a wheeled type machine with a movement control. This floor cleaning machine is comprised of several AC motors that drives the wheels and rotating objects for the scrub. Wiring of the motors are properly designed that the wheels set up considering the control is from two dual two way switches. A pushbutton is also set as ON/OFF switch of the rotating objects as scrubs. Plastic pipe are also designed in which it has holes and gate valve that manages the release of cleaning liquid on the floor. The machine is wired using LAN wires connected to its controller while the controller has the connection of the AC supply. This project is applicable for several floor cleaning activities. Torque required to revolve the bracket is about16 N-M. Motor gives 4.94 N-M at 1440 RPM. A smaller pulley is fixed on the motor shaft and bigger pulley is fixed on the main shaft so that speed is reduced to 360 RPM and torque is increased up to 19 N-M. Hence motor will run without getting any load on it. The present work is aimed at designing a compact floor cleaner that can be useful for house-hold purpose. stored so that it could be removed later. This is achieved by using a 12v vacuum pump with a debris chamber attached to it. The next aim is to make the surface wet which is carried out by sprinkling water on the floor. The aim is achieved by using a motor and a sprinkler system. This system has a shower like outlet and a chamber whose outlet is controlled by a dc motor pump. To clean the surface scrubber has to move or scrub over the floor. The dirt should be completely removed and the debris laden water will flow towards the rear of the bot. the scrubber is fixed to the chassis using clamps. The construction of the scrubber includes fixing one side to the motor and the other to the ball bearing. The bearing is clamped to the chassis. At the rear of the system a vacuum mechanism is used to suck the debris laden dirty water. This is also the same type of pump and the chamber

6. CONCLUSION

Thus in our project we have designed the Automatic floor cleaning machine with the help of A.C Motor and belt transmission. The machine is designed in order to enable easy operation and to reduce the effort of human beings. Even children and aged people can handle this machine, no critical operations is needed in this machine. The ultimate need of this project is satisfied and with the help of this machine we can clean the floor easily.

The product thus developed is fully operational and gives desired motion. It is being tested in a room which results in successful outcome. The scrubber design should be modified in future because the current design has few problems. Few of those are the motor is not detachable and the high rpm leads to vibration of the whole system. If these features will be modified, this will work well. In our case 2 vacuum pumps are used which leads to loss of power. This can be reduced by substituting these 2 pumps with one pump having 2 path ways. This will be the next development stages. This not only decreases cost but also increases reliability of the instrument. Overall the concept is very much helpful and there is scope of a lot of development in mechanical parts. The optimization will continue till achieving the best one. Overall the project is successful to its intent and will definitely change the era robotics and floor cleaning. In the automation part the algorithm are designed to give 90% efficiency which is too high in current scenario. The development can be made in the field of sensing. But this product has the capability to detect as well as move in the direction of dust and thus resulting in better cleaning of floors. As a whole this is a successful product developed that can be used in current Indian house-hold.

7.REFERENCE

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