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FLOOR CLEANING MACHINE: A REVIEW

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Abstract

In our everyday life lack of cleaning gives birth to many communicable diseases in which infectious diseases are more in number. Maintaining good personal as well as environmental hygiene protect us from medical mishaps. In early times, it was the time when no reports were published or no cleanliness survey was taken but somewhat cleanliness was maintained, without being aware of it. In 1900's, various diseases came into existence, at this time issues like personal and environmental cleanliness were not given importance. Hundreds of people every year in world were losing their lives due to unawareness about hygiene. In 1950's, considering importance of health and hygiene researchers started studying this and found that avoiding lack of cleanliness can prevent us from being ill. And from here on different types of devices being invented of various purposes. Floor cleaning machines with various electrical inputs were being developed. With each development in technology the devices kept on upgrading from motor operated to totally electrical driven to automatic to self guided cleaning robots. These devices kept on upgrading as per requirement and ensured that no intervention of human beings. Taking into consideration the floor cleanliness, which is responsible for many airborne diseases such as Listeriosis etc, therefore we built an floor cleaning machine which is manually operated hence no electrical power is needed, a person can operate it easily and can cover maximum amount of cleaning area so as to reduce the human effort. This will clean more surface area of floor in single sweep than the sweep made by human which will lead to more floor cleaning in less time.

Index Terms: Hygiene, Cleanliness, floor cleaning, pedal operated, etc.

1. INTRODUCTION

Floor cleaning machine, i.e. cleans the floor surface and keeps the environment clean and safe to breath. As from the report of World Health Organization (WHO) India ranks first in tuberculosis patients, this also states that 10% of people out of 500,000 show the symptoms of tuberculosis. This floor cleaning machine is built by considering the problem statement which states as, "To clean maximum floor surface area in minimum time, efficiently". This machine is purely built on the problem requirement. For cleaning different surfaces different machines with various cleaning materials is used, no cleaning machine is 100% applicable on every surface. Single person is required to operate this machine. This machine is pedal operated and doesn't require any source of electricity. This machine covers about 5ft of cleaning area in a single use. Its design is similar to tricycle so it is not difficult for any person to operate.

2. LITERATURE SURVEY

Hermann Meili (1985), in this paper the inventor built machine which takes care of using fresh cleaning liquid onto floor. It comprises of housing tank, battery, pump, motor, etc. Author also mentioned that battery can be neglected and direct supply for motor can also be used. Vacuum pump is also used to clean surface before mopping.

Dwipendra N. Guha (1995), in this paper the inventor built machine for automatic mopping of floor. Mopping by this machine is provided such that, it can also clean corners. The mops are rotating on wheel whose rotational axis is perpendicular to the floor.

Swarup Raj Jena (2015), in this paper the inventor built machine based on arduino system. It is assisted by arduino. It is mainly built to eliminate human intervention. And once started cleaning, will clean whole room without any omission of surface.

3. BASIC CONCEPT DESIGN

The floor cleaning machine has the basic design of tricycle along with an extension provided on the back side of tricycle. The tricycle works as cycle whereas the cleaning brushes attached at back end revolves with increment in pedalling through pulleys and v-belts.

4. CONSTRUCTION DETAILS

Construction of floor cleaning is explained along with its parts as follows:

4.1 CHASSIS



Fig:- Chassis.

The chassis is built by using iron hollow square section pipe. The chassis design is suitable according to its requirement. And it is rigid as well as unique.

4.2 PULLEYS

In floor cleaning machine three pulleys of A-type are used and they are:

- a) Small single pulley having diameter 2 inch.



Fig:- Small single pulley.

- b) Small double pulley having diameter 2.5 inch



Fig:- Small double pulley .

- c) Bigger diameter pulley having diameter 10 inch.



Fig:- bigger pulley.

4.3 SHAFTS

- a) Main Shaft



Fig:- Main shaft.

This main shaft is important link for motion transfer from pedal to wheel. It transfer motion to wheel and also sustain the weight of the whole assembly along with driver's weight. It is made of iron alloy. Its diameter is 3 inch and length is 40 inch.

b) 2 vertical shaft.



Fig:- vertical shaft.

The 2 vertical shafts at the back end one on the right corner and other on the left corner are made of iron alloy. Both are solid square section.

4.4 BACK END EXTENSION

This holds the assembly for brushes. This is also made from iron hollow square section



Fig:- Back end extension.

4.5 BRUSHES



Fig:-Brushes

Brushes are of foam along with cloth on it for better cleaning.

4.6 WHEELS

a) Front wheel of diameter 18 inch is used. It is solid made of rubber.



Fig:- Front wheel.

b) Rear wheel of diameter 29 inch is used. It is solid made of rubber.



Fig:- Rear wheels.

5. WORKING OF MACHINE

The working of floor cleaning machine is quite simple. As it is pedal operated machine, the driver on the seat will apply force on pedal, through the chain sprocket, chain starts moving with respect to sprocket fixed on the shaft, along with it the shaft will start moving.. The bigger pulley fixed on the shaft will tend to rotate as per the motion of the wheel. The back end extension is provided with two vertical shafts on right and left corners.

The bigger diameter pulley is located inside of the left wheel on the shaft. Hence the vertical shaft on the back end extension, on the left side has double pulley, to get motion and to transmit motion on right pulley which is connected by v-belt to left pulley. And accordingly the motion will transmit. Both the vertical shafts will rotate and brushes attach to the bottom end of the shaft will rotate and this is how the cleaning will be done.

Along with it a tank will be provided which will be provided which will contain mixture of antiseptic liquid and water to vanish off the harmful bacteria present on the floor.

6. ADVANTAGES

- This machine doesn't require power to operate.
- This machine is easy to handle i.e. user-friendly.
- Floor cleaning machine can be used for space where large surface area is to be cleaned.
- This machine is excellent alternative option for manually cleaning floor with mop.
- More surface area in less time is important advantage of this machine.

7. CONCLUSION

Floor cleaning machine is solution to a problem (i.e. for a specific surface) and can't be used for every surface. Floor cleaning machine is easy to use by any person. Large surface area can be cleaned with it such as airports, college, hospitals, etc. Its benefit can be observed when there is power cut.

FUTURE SCOPE

In future this machine can be used more efficiently by making small advancement in it such as battery operated brushes reduce effort on pedal, compressed and robust design, improvement in brushes for cleaning the corners.

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