

Floor Cleaner Machine using Bevel Gear Mechanism

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Abstract— This paper deals with the Floor cleaning Machine Using Bevel Gear Mechanism, and the aim of this paper is to develop a process for cleaning the floor by both wet and dry process simultaneously without any electrical needs. During the cleaning and moving operation of vehicle, a propulsion mechanism such as drive wheels for the dry tracking on the floor and driven bevel gear was connected with a mop for wet surface to be cleaned. Hence, it can be widely applicable in houses, hospitals, auditorium, shopping malls, railway stations, bus stands etc. As this works fully with the help of mechanical process and this saves the power requirement. The basic advantage of this product is that it will be cost effective.

Key words: Floor Cleaner Machine, Bevel Gear Mechanism

I. INTRODUCTION

A. Floor Cleaning

It is a major occupation throughout the world and has been since ancient times. Cleaning is essential to prevent injuries due to slips and to remove dirt. Floors are also treated to protect or beautify the surface. The correct method to clean one type of floor can often damage another, so it is important to use the correct treatment.

II. OBJECTIVES:

- Floor cleaner is very much useful in cleaning floors in hospitals, houses, auditorium, shopping malls, IT sectors, bus stands, railway stations, etc.
- It is very simple in construction and easy to operate. Anybody can operate this machine easily. It consists of moisture cotton brush for cleaning the floor.
- The time taken for cleaning is very less and the cost is also very less. Maintenance cost is less. Many type of machines is widely used for this purpose. But they are working under different principles and the cost is also very high when compare to this.

III. THE HISTORY OF FLOOR CLEANING MACHINES

The first useful electric-powered floor machines date back to the early 1900s. Coincidentally, this was about the same time vacuum cleaners were introduced, which we discussed last month. The first floor machines were known as "divided-weight" machines. With these machines, the bulk of the weight of the machine was on its rear wheels, which remained on the floor during operation. The buffer rolled in a push-pull fashion over the floor for both scrubbing and polishing. These early machines used brushes made of Tampico and Bassine, vegetable fibers used for centuries for floor scrubbing and polishing. To polish wood floors, carnauba wax would be applied to the floor, and then polished to a shine by going back and forth over the floor with the buffer. Divided-weight machines lacked sufficient speed, weight, and pressure over

the brush to produce a high-gloss shine, and they were hard to maneuver. The major benefits for the user were that the machines were faster and less strenuous to use than polishing a floor by hand. Ultimately, the pad and chemical manufacturers introduced products that would hold up well with electric machines producing 1,500 to 2,000 rpm.

IV. BENEFITS OF FLOOR CLEANING MACHINE

Floor care cleaning, stripping and finishing are synonymous with time-consuming, labor-intensive and costly. With minimal resources, custodial managers are looking for products and processes that will make tackling floor care challenges simpler. According to distributors, there is equipment that can help improve worker productivity and reduce purchasing: Oscillating floor machines.

V. NEED FOR FLOOR CLEANING

The principal reasons for floor cleaning are:

- To prevent injuries due to tripping or slipping. Injuries due to slips and trips on level floors are a major cause of accidental injury or death. Bad practice in floor cleaning is itself a major cause of accidents.
- To beautify the floor.
- To remove stains, dirt, land, litters obstructions.
- To remove grit and sand which scratch and wear down the surface.
- To remove allergens, in particular dust.
- To prevent wear to the surface (e.g. by using a floor wax or protective sealant).
- To make the environment sanitary (e.g. in kitchen).
- To maintain an optimum traction (e.g. for dance floors).

VI. METHOD OF FLOOR CLEANING

The treatment needed for different types of floors is very different. For safety it is most important to ensure the floor is not left even slightly wet after cleaning or mopping up. Sawdust is used on some floors to absorb any liquids that fall rather than trying to prevent them being spilt. The sawdust is swept up and replaced each day. This was common in the past in pubs and is still used in some butchers and fishmongers. It used to be common to use tea leaves to collect dirt from carpets and remove odours. Nowadays it is still quite common to use diatomaceous earth, or in fact any cat litter type material, to remove infestations from floors. There are also a wide variety of floor cleaning machines available today such as floor buffers, automatic floor scrubbers and sweepers, and carpet extractors that can deep clean almost any type of hard floor or carpeted flooring surface in much less time than it would take using a traditional cleaning method.

VII. POWER TRANSMISSION

Belts are the cheapest utility for power transmission between shafts that may not be axially aligned. Power transmission is achieved by specially designed belts and pulleys. The demands on a belt drive transmission system are large and this has led to many variations on the theme. They run smoothly and with little noise, and cushion motor and bearings against load changes, albeit with less strength than gears or chains. However, improvements in belt engineering allow use of belts in systems that only formerly allowed chains or gears.

Power transmitted between a belt and a pulley is expressed as the product of difference of tension and belt velocity.

$$P = (T_1 - T_2)v$$

Where, T_1 and T_2 are tensions in the tight side and slack side of the belt respectively. They are related as:

$$\frac{T_1}{T_2} = e^{\mu\alpha}$$

Where, μ is the coefficient of friction, and α is the angle subtended by contact surface at the centre of the pulley.

VIII. BEARING

A bearing is a machine element that constrains relative motion to only the desired motion, and reduces friction between moving parts. The design of the bearing may, for example, provide for free linear movement of the moving part or for free rotation around a fixed axis; or, it may prevent a motion by controlling the vectors of normal forces that bear on the moving parts. Many bearings also facilitate the desired motion as much as possible, such as by minimizing friction. Bearings are classified broadly according to the type of operation, the motions allowed, or to the directions of the loads (forces) applied to the parts principles of operation.

IX. WORKING PRINCIPLE

The cleaning liquid is mixed in proper proportion and it is poured into the reservoir through the top way. The cleaning liquid is poured until the tanks are filled. Actuating the lever opens the valve. Cleaning liquid from the tank spills on the brush required amount. The brush gets drive from manual power through pulleys and belts. The brush applies pressure on the floor, when the adjuster rod is unscrewed and the handle is moved in the required direction to clean the sufficient area. Again the lever is operated to supply cleaning liquid whenever required. This process is repeated, so floor is cleaned well. The cotton brush prevents the damages on the mosaic, marble floors and gives smooth surface finish and shining.

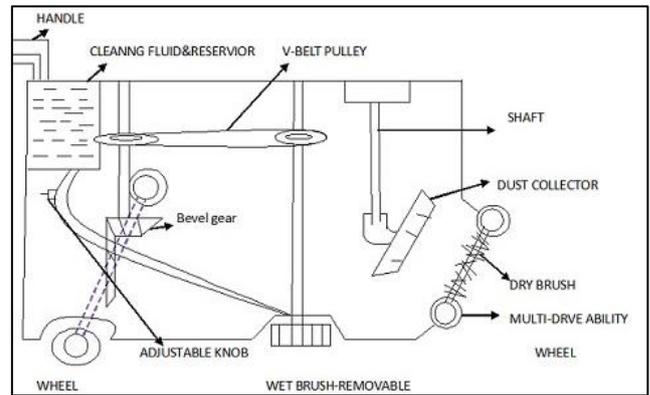


Fig. 1: Floor Cleaner

X. ADVANTAGES

- Cleaning and polishing can be done at same time.
- It consumes less cleaning liquid.
- Power consumption is less.
- Design is very simple.
- Easy fabrication.
- It occupies less floor area.
- Net weight is less.
- Maintenance cost less.
- Easy control of cleaning solution supply.
- It can be used in various floors.
- Smoother operation.
- By further modification the drive or movement can be made automatic.

XI. APPLICATIONS

- Domestic purpose.
- Hospitals.
- Computer centers.
- Auditoriums.
- Cultural centers.
- Schools.
- Colleges.
- Large scale industries.
- Medium scale industries.
- Theatres.
- Educational institutions.

XII. LIMITATIONS

- Vibrations will be produced when used on rough floors or surfaces.
- The washed surface has to be wiped out for thorough cleaning.

XIII. CONCLUSION

Thus our project will lead the future to go a step ahead without electricity and make changes over the new technologies. The consumption of time and human work reduces with the cleanness of environment in all over the world. Now-a-days the need of electricity is more in our day today life but this machine gives out a change over the other system, so this will help us to save the electricity for our next generation.

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