

Manually Operated Floor Cleaning Machine

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ABSTRACT

Floor cleanliness is a fundamental aspect of maintaining hygiene and aesthetic standards in both residential and commercial environments. These machines are typically driven by the physical effort of the operator, utilizing a system of brushes, rollers, squeegees, or scrubbing pads to dislodge and collect dirt, dust, debris, and liquid contaminants from floor surfaces. The mechanical advantage offered by the device amplifies the operator's effort, enabling efficient cleaning over large surface areas with minimal fatigue. The structural design of a manually operated floor cleaning machine typically includes a robust frame, a handle for operator comfort, a brush or pad assembly, and wheels or casters for smooth maneuverability. Materials such as high-density polyethylene, stainless steel, and aluminium alloys are commonly used in construction to ensure durability, corrosion resistance, and lightweight handling. The adjustable handle height and swivel head features further enhance adaptability across different user profiles and floor geometries.

Keywords: Floor cleaning, pads, dust.

INTRODUCTION

The maintenance of clean and hygienic floor surfaces is a critical requirement in modern society, spanning residential homes, commercial establishments, industrial facilities, healthcare institutions, and public spaces. Flooring systems accumulate dust, dirt, debris, and various contaminants through daily use, necessitating regular and effective cleaning to maintain both aesthetic appeal and sanitary conditions. While the cleaning industry has witnessed significant technological advancement with the introduction of automated and electrically powered cleaning equipment, manually operated floor cleaning machines continue to remain an indispensable tool in the global cleaning landscape.

LITERATURE REVIEW

The regular floor cleaning machines are most generally utilized as a part of airplane terminal stages, railroad stages, healing centers, transport stands, and shopping centers and in numerous other business places. These gadgets require an electrical vitality for its activity and not easy to use. In India, particularly in summer, there is control emergency and the vast majority of the floor cleaning machine isn't utilized successfully because of this issue, especially transport stands. In this

work, demonstrating and investigation of the floor cleaning machine was finished utilizing appropriate financially accessible programming. From the limited component investigation, watch that the feeling of anxiety in the physically worked floor cleaning machine is inside as far as possible.

List of Construction Material Following are the main components used in project—

1. Wheels
2. Sprockets
3. Shaft
4. Carpet
5. Bevel gear

1. WHEELS

It cleans the surface as well as catches all unwanted material from road. It is a tricycle operated system we have given motion to sweeper using chain drive mechanism. After main shaft secondary chain used to rotate secondary axle which are directly connected to sweeper axle. Third axle also connected to system which has cotton brush which clean surface. For properly working of sweeper addition of new shaft. Addition chine drive in both side used to increase gear ratio. Addition of two wheel in back side of machine for giving support to frame.

2. SPROCKETS

Chain Drive is relatively easy to install. Assembly tolerances are not as restrictive as those for gear drives. Chain drives are a better choice for less experienced builders working with a minimum of machine tools. Sprockets are used in bicycles, motorcycles, cars, tracked vehicles, and other machinery to transmit rotary motion between two shafts where gears are unsuitable or to impart linear motion to a track, tape etc. Early automobiles were also largely driven by sprocket and chain mechanism, a practice largely copied from bicycles.

3. SHAFT

Axle is used for mounting sprocket and wheels. We use three axle first axle is used for transmission power, second axle is used for mounting sweeper brush, and third axle is used for mounting supporting wheels. Mild steel material is selected for an axle due to mild steel has a resistance to breakage. Mild steel, as opposed to higher carbon steels, is malleable, even when cold this means it has high tensile and impact strength higher carbon steels usually shatter or crack under stress.

4. CARPET

A carpet bonnet is manufactured from a mixture of polyester and viscose and is an extremely effective cleaning technique. For best results the carpet should first be vacuum cleaned and pre-sprayed to tackle any heavy soiling. A solution of the appropriate detergent is used to pre-soak the bonnet mop which is then wrung out before being used to buff the carpet.

5. BEVEL GEAR

Straight bevel gears are the most economical of the various bevel gear types. These gears are used primarily for relatively low-speed applications with pitch-line velocities up to 1000 fpm, where smoothness and quietness are not significant considerations. However, with the use of a finishing operation (e.g., grinding), higher speeds have been successfully handled by straight bevel gears.

CONCLUSION

The development, implementation, and evaluation of manually operated floor cleaning machines demonstrate their significant value as practical, sustainable, and cost-effective solutions for maintaining clean and hygienic floor surfaces across diverse environments. These machines successfully bridge the gap between traditional manual cleaning methods and expensive automated systems, offering a balanced approach that maximizes cleaning efficiency while minimizing physical strain, operational costs, and environmental impact.

While some limitations were identified—including maneuverability in tight spaces and occasional debris containment issues—these can be addressed through design improvements and operational adjustments. The machines' modular nature allows for future enhancements in ergonomics, materials, and functionality without compromising their core advantage.

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