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Manually operated floor cleaning machine

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ABSTRACT:
This project deals with the design of new products. In recent years, floor cleaning and fabrication of manually operated floor cleaning machine. The conventional floor cleaning and machines is most widely used in airport platforms, railway platforms, hospitals, bus stands, malls and in many other commercial places. These devices need an electrical energy for its operation not user friendly. In India, especially in summer, there is power crisis and most of the floor cleaning machine is not used effectively due to this problem, particularly in bus stands. Hence it is a need to develop low cost, user friendly floor cleaning machine. 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 analysis of the floor cleaning machine was done using suitable commercially available software. The conventionally used materials were, considered for the components of floor cleaning machine. **KEYWORDS:** Floor cleaning machine, Design and Fabrication, Analysis.

I. INTRODUCTION

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 labor 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 novation publications international journal of innovations in engineering research and technology [iciest] sins: 2394-3696 volume 4, issue 3, mar.-2017 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

II. LITERATURE REVIEW

M RANJIT KUMAR (2016)

"The regular floor cleaning machines is 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

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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".

SANDEEP. J. MESHRAM ET AL [2016]

"Design and Development of Tricycle Operated Street Cleaning Machine" He has developed the street cleaning machine by tricycle operated. it this research article. He framed a model especially for rural area. He concluded that the cleaning is less effective in streets"

MOHSEN AZADBAKHT ET AL [2014]

"Design and fabrication of a tractor powered leaves collector machine equipped with suction-blower system" "The authors explained about the fabrication of leaves collector machine by tractor powered blower. He has frame the machine by using chassis, pump, blower, gearbox, hydraulic jack. They concluded total power consumption of that machine is around 14634 W which can cover up to 20m range in distance

III. WORKING METHODOLOGY

Machine consist of rollers ,water tank, sprocket & chain mechanism, collector brush assembly, drive wheel, and cotton etc. cotton is wound around supporting roller and main rollers. But main roller is placed in water tank so that wetted cotton is transfer forward for cleaning. Cotton is rotate due to use of chain drive. And for chain drive gives the drive from wheel. Two small rollers are mounted on surface. The compression rollers are used for removing the excess water. In front of machine the collector is placed for collecting the dirt, dust particle before the cleaning of surface. When we are push the machine forward direction cotton will be rotate around the rollers which will clean the surface. This cycle of rotation of cotton will repeated.

IV. OPERATION PERFORMED

CUTTING: Cutting is the separation of a physical object, into two or more portions, through the application of an acutely directed force. Implements commonly used for cutting are the knife and saw

WELDING is a process in which two or more parts are joined permanently at their touching surfaces by a suitable application of heat and/or pressure. Often a filler material is added to facilitate coalescence. The assembled parts that are joined by welding are called a weldment.

GRINDING: Grinding practice is a large and diverse area of manufacturing and tool making. It can produce very fine finishes and very accurate dimensions; yet in mass production contexts it can also rough out large volumes of metal quite rapidly.

DRILLING: Drilling is a cutting process that uses a drill bit to cut a hole of circular cross-section in solid materials. The drill bit is usually a rotary cutting tool, often multi-point. The bit is pressed against the work-piece and rotated at rates from hundreds to thousands of revolutions per minute.

TURNING: Turning is a machining process in which a cutting tool, typically a non-rotary tool bit, describes a helix tool path by moving more or less linearly while the work piece rotates.

BENDING: Bending is a manufacturing process that produces a V-shape, U-shape, or channel shape along a straight axis in ductile materials, most commonly sheet metal. Commonly used equipment includes box and pan brakes, brake presses, and other specialized machine presses.

COMPONENTS:

The main component of the experimental setup and the constructional detail of the setup are described below:

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

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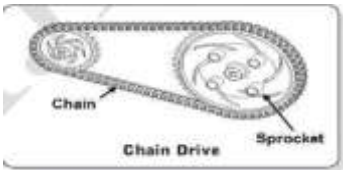
machine tools. Sprockets are used in bicycles, motorcycles, cars, tracked vehicles, and other machinery to transmit rotary motion between two shafts where gears are unsuitable or to impart linear motion to a track, tape etc. Early automobiles were also largely driven by sprocket and chain mechanism, 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 quite 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 ―buffǁ 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.

6. CASTER WHEELS

A basic, rigid caster consists of a wheel mounted to a stationary fork. The orientation of the fork, which is fixed relative to the vehicle, is determined when the caster is mounted to the vehicle. An example of this is the wheels found at the rear of a shopping cart in North America. Rigid casters tend to restrict vehicle motion so that the vehicle travels along a straight line. Industrial casters are heavy duty casters that are designed to carry heavy loads, in some cases up to thirty thousand pounds. An Industrial caster may have either a swivel or rigid caster

DESCRIPTION

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.

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V. RESULT, CONCLUSION AND FUTURE SCOPE

From the observation, we mainly conclude with the following results:

• Given the intensity be constant, the efficiency of a parabolic trough collector changes inversely with that of the flow rates. We see an increase of 50-70% in efficiency when the flow rates is decreased by 33%

• Mirror reflecting surface gives better efficiency compared to that of aluminium reflecting surface.

• We mainly see the change in the solar intensity from the morning to the evening as the intensity rises in the morning hours and reaches its peak value between 12:30 PM and 1:30 PM then again decreases in the evening hours.

• The efficiency of a parabolic trough collector mainly depends on Solar Intensity, type of fluid used, Reflecting Surface and flow rates.

Conclusion

We mainly conclude through the findings of our project how different flow rates play a major role in the working of a solar parabolic trough collector. As the efficiency shown by a parabolic trough collector is more than that of a flat plate collector, there is a scope for wider use as to increase the outcome of such. But there is a short disadvantage of parabolic trough collector as there needs to be a tracking device so as to check the functioning of the parabolic trough type collector. We further see that nature of reflecting surface also plays a major role in the output of the working of a solar collector.

As the renewable sources of energy is a prime concern in the fulfilment of energy supply in today's world, technical upgradation in the field of design of such technology is a must to gather maximum output. The solar parabolic trough collector is indeed a better alternative to the flat plate solar collector which is widely used today to extract solar energy, modification of the same will surely boost for a better yield.

Future Scope

Floor washing machine is ideal for small & medium size Super- markets. Floor washing machine ideal for hospitals because of the low noise level. Essential tool for maintaining high level of hygiene for Hotel - kitchens and restaurants Safety feature includes pedal to secure the handle intact. Floor Washing's easy maneuverability and easy to reach beneath the furniture. No tools required to change brushes.

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