PEDAL OPERATED FLOOR CLEANING MACHINE

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ABSTRACT: The conventional floor cleaning 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 and 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 machines. In this work, modeling and 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 .From the finite element analysis , we observe that the stress level in the manually operated floor cleaning machine is within the safe limit. 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 shelf 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 for all locations and occasions and effective cleaning depends upon type of cleaning device, 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 of new products. In recent years, floor cleaning 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.

I. INTRODUCTION

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 for all locations and occasions and effective cleaning depends upon type of cleaning device, 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 of newproducts. Recent years, floor cleaning robots are getting more popular for busy and aging populations due to lack of workers. However in India, unemployment is more 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 shelf life of the floor, walls etc. due to regular cleaning and maintenance .In recent years, most of the people 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. CERTIFICATE

II. OBJECTIVE OF PROJECT

In cleaning machine from in lever maintenance cost and time. Chain drive will be joint in cleaning machine to a maximum efficiency will be required. To provide water tank in cleaning machine to be fresh water will be required in swiping.

PROBLEM OF PROJECT

The major problem in India faces is cleanliness. The problem in India on roads, pathways, lanes, highways, railway stations airports not cleanliness.

The dust and dirt on the road as well as metal and other pieces on the road are a problem for the humans.

It is harmful for human race as well as the vehicles running on the road. On the other hand metal particles and other abrasive particles are harmful for tires of vehicles. The main feature would be cost efficiency as the cost to make the machine is very less as compared to other cleaners available in the market

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. After the required amount is delivered, the lever is released and the machine is switched ON.

The brush gets drive from motor 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.
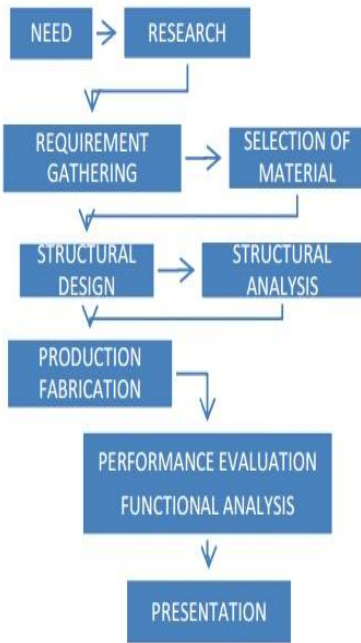
Again the lever is operated to supply cleaning 3D Model of Assembled Machineliquid whenever required. This process is repeated, so floor is cleaned well.The cotton brush prevents the damages on the mosaic, marble floors and gives

smooth surface finish and shining..

III. DESIGN METHODOLOGY

The procedure mentioned in the flow chart was followed during design and fabrication of the product.

1 Market Analysis to identify problems.
2. Selection of suitable fabrication materials.
3. Concept design of structure
4. Analysis of design and optimization
5. Start of production and fabrication
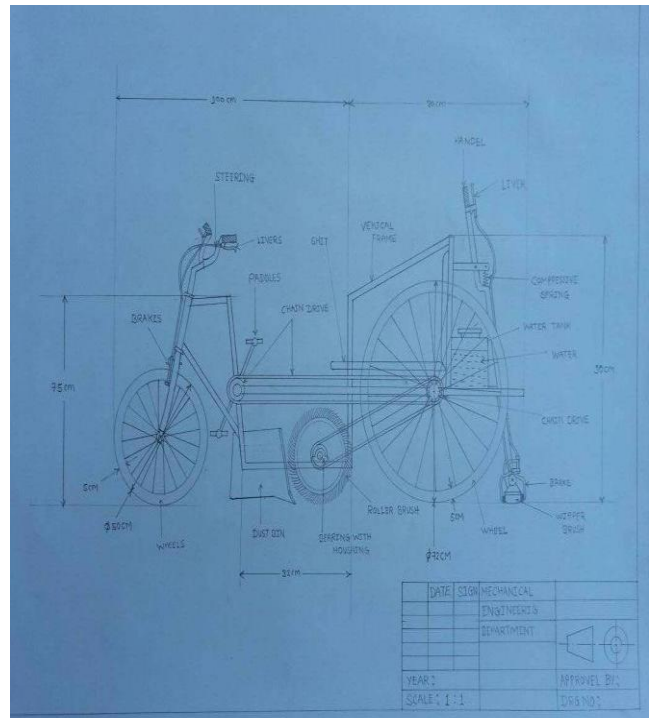6. Testing and evaluation of overall performance

AUTOCAD DRAWING AND CALCULATION

DESIGN CALCULATION

CALCULATION
A. Specifications
1) Length: 1.8 m.
2) Width: 0.50 m.
3) Height: 0.90 m.
4) Kerb Weight: 30 kgs (approx.)
No. of teeth on the pedal sprocket Z_1= 24 teeth

No. of teeth on the wheel sprocket of gea r , Z_2= 24 teeth
Gear ratio Z_1/Z_2= 1

1) Pitch circle diameter of the D_1 = 500mm
2) Pitch circle diameter of the pinion D_2=720mm
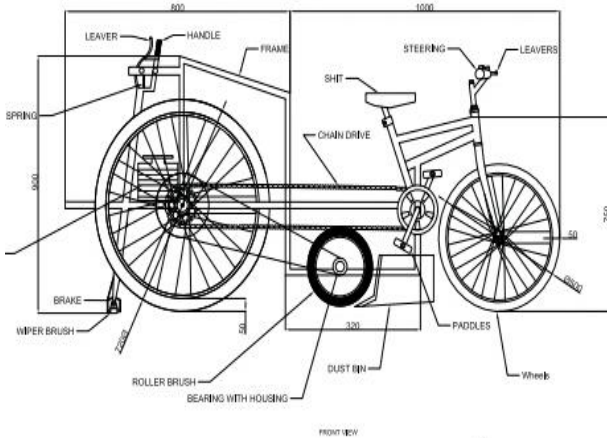3) Face width = 50mm
4) Pressure angle a = 20°

Area swept by the mop:
At 7.45 kmph, the mopping machine moves at 2.07m/s
Thus, area swept by the mop/ pedal rotation
= 2.07*mop diameter
= 2.07*0.50
= 1.035 m2
In one minute, the mop can sweep 0.7245*60 = 62.1 m2

DIAGRAM

MATERIAL AND COMPONENT USED

MATERIAL
- mild steel
- cotton yarn
- cast iron
- steel angle bar
- steel plate
- chain drive

- steel plate with stainless steel edge

COMPONENT
- pedal
- gear mechanism
- brake
- lever and spring
- wheel
- rotating wheel
- water tank
- swiper
- roller brush
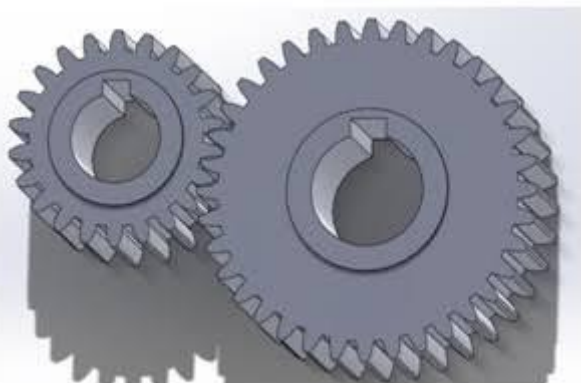- bicycle frame
- handle

HANDLE

To the balance of the cycle and easily moment and control the cycle

PEDAL:

In a pedal from the cycle a running the cycle to forward and backward will be easily and operate the cycle.

GEAR MECHANISM

Gear mechanism to be used in cycle from will be higher

speed and to pinion and gear mechanism to be used from to joint the wheel.

BRAKE POWER

To a different types of brake in forward and backward wheel to stop the cycle immediately

LEVER AND SPRING

Lever and spring mechanism to connect to sweeper and dirty water and wastage material will be remove by the sweeper.

WHEEL

Forward and backward wheel to stable thee cycle.

ADVANTAGES AND LIMITATION
ADVANTAGES
Operating time is less.
- 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

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

FUTURE SCOPE
- Floor washing machine ideal for small & medium size Super- markets. Floor washing machineideal 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

IV. CONCLUSION
- Manually operated floor cleaning machine is an alternative for an automated floor cleaning machine during power crisis.
- The equipment purposely design for cleaning floors, but can only be use in outdoors with large ground like the hospitals, bus stands, railway stations etc
- The equipment will result more beneficial when it is compared to other existing floor cleaning machines. Our project is based on very simple chain drive mechanisms which can be easily operated by any person. Any fault in machine can be easily identified and can be corrected on the spot

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