IJIREEICE ISSN (O) 2321-2004, ISSN (P) 2321-5526

International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.047 ⁜ Vol. 10, Issue 7, July 2022

DOI: 10.17148/IJIREEICE.2022.10708

AUTOMATIC TILES CLEANING MACHINE

Abitkar Suraj M[1], Dange Akash S[2], Desai Shambhuraje B[3], Warke Prathamesh D[4], Ghatage Abhishek B[5], Prof. S. J. Bardeskar[6]

Student, Dept. of Mechanical Engineering, DR. A. D. SHINDE COLLEGE OF ENGINEERING, GADHINGLAJ, DIST.KOLHAPUR[1-5]

Assistant Professor, Dept. of Mechanical Engineering, DR. A. D. SHINDE COLLEGE OF ENGINEERING, GADHINGLAJ, DIST.KOLHAPUR[6]

Abstract: Automatic tiles cleaner is a system that enables cleaning of the tiles by the help of highly stabilized and rapidly functionalized electronic and mechanical control system. Current project work targets to use automatic tiles cleaner for large tiles in house-hold purposes and office tiles. The cleaning purpose is specifically carried out by continuous relative motion between a scrubber and the tiles surface. During the cleaning and moving operation of vehicle a propulsion mechanism such as driven wheels and guide wheels for the dry tracking on the floor surface to be cleaned, suction of water is carried out by vacuum pump, scrubbing action is done by the scrubber directing water towards rear end. Preferably, a sweeper mechanism is mounted on the body forwarded by propulsion mechanism and operated with such control system for advance sweeping of a debris-laden floor surface. A PID controller is used to govern the motion of system which takes the input from sensor circuit and feeds it back to microcontroller which gives rise to the simulation of wheel in a synchronized manner. The new automatic floor cleaner will save huge cost of labor in future. The basic advantage of this product is that it will be cost effective and no human control is needed. Once put in on mode it will clean the whole room without any omission of surface.

I. INTRODUCTION

Cleaning is the essential need of the current generation. Basically in household floors the floor has to be cleaned regularly. Different techniques are used to clean the different types of surfaces. The reasons for floor cleaning are:

1. Injuries due to slips on the floors are cause of accidental injuries or death.
2. To beautify the floor.
3. Debris and obstructions are to be removed.
4. Allergens and dusts are to be removed.
5. Surface wear to be avoided.
6. To make the environment sanitary (kitchens).

Floor cleaning is achieved by different technique which might be of different kinds. Different types of floor need different type of treatment. The floor should be totally dry after the cleaning process. Otherwise it may result in hazard. On some floors sawdust is used to absorb all kind of liquids. Our automatic floor cleaner will save huge cost of labor in future. This ensures that there will no need of preventing them from spill of the sawdust has to be swept and replaced every day.Household cleaning is a repetitive task carried out by number of people every day.

IJIREEICE ISSN (O) 2321-2004, ISSN (P) 2321-5526

International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.047 ⁜ Vol. 10, Issue 7, July 2022

DOI: 10.17148/IJIREEICE.2022.10708

The project is fully unified for cleaning application. It features the requirements needed for floor cleaning such as water supply, scrub and fan. It is a wheeled type machine with a movement control. This floor cleaning machine is comprised of several AC motors that drives the wheels and rotating objects for the scrub. Wiring of the motors are properly designed that the wheels set up considering the control is from two dual two way switches. A pushbutton is also set as ON/OFF switch of the rotating objects as scrubs. Plastic pipe are also designed in which it has holes and gate valve that manages the release of cleaning liquid on the floor. The machine is wired using LAN wires connected to its controller while the controller has the connection of the AC supply. This project is applicable for several floor cleaning activities.

II. LITERATURE REVIEW

Karthick. T (2015)

These technologies are used to develop machines that can substitute for humans and replicate human actions. Robots can be used in many situations and for lots of purposes, but today many are used in dangerous environments manufacturing processes, or where humans cannot survive (e.g. in space, under water, in high heat, and clean up and containment of hazardous materials and radiation). Robots can take on any form but some are made to resemble humans in appearance. This is said to help in the acceptance of a robot in certain replicative behaviours usually performed by people. Such robots attempt to replicate walking, lifting, speech, cognition, or any other human activity. Many of today's robots are inspired by nature, contributing to the field of bio-inspired robotics.

Manya Jain(2017)

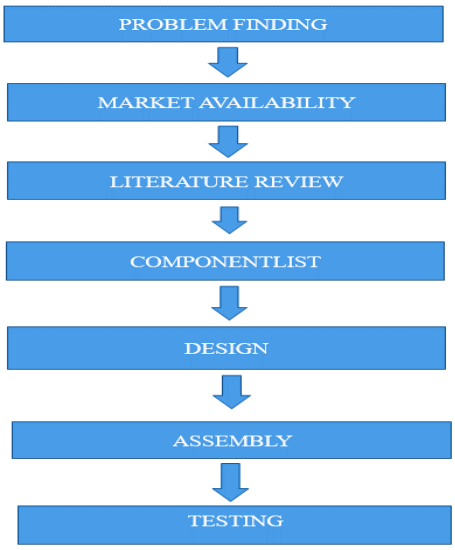
Brushless DC motor is widely used in the space industry owing to its high performance, but the complex application environment brings a lot of damage factors to the motor. For example, the space radiation may damage the circuit device, and strong electromagnetic fields may interfere with motor operation. Therefore, the high reliability of the motor system becomes increasingly important. In order to improve the reliability of the motor system, a self-repairing control circuit was presented in the past research, it adopt evolvable hardware (EHW) method based on virtual reconfigurable circuit (VRC). But this method has a high resource overhead and a large circuit delay.

Dr. J. Hameed Hussion (2016)

Microcontrollers usually contain from several to dozens of general purpose input/output pins (GPIO). GPIO pins are software configurable to either an input or an output state. When GPIO pins are configured to an input state, they are often used to read sensors or external signals. Configured to the output state, GPIO pins can drive external devices such as LEDs or motors, often indirectly, through external power electronics.

Many embedded systems need to read sensors that produce analog signals. This is the purpose of the ADC. Since processors are built to interpret and process digital data, i.e. 1s and 0s, they are not able to do anything with the analog signals that may be sent to it by a device. So the analog to digital converter is used to convert the incoming data into a form that the processor can recognize. A less common feature on some microcontrollers is DAC that allows the processor to output analog signals or voltage levels.

III. METHODOLOGY



IJIREEICE ISSN (O) 2321-2004, ISSN (P) 2321-5526

International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.047 ⁜ Vol. 10, Issue 7, July 2022

DOI: 10.17148/IJIREEICE.2022.10708

PROBLEM FINDING:

- Human efforts are required.
- Time is more required.
- Human is tired while operating.

Market Availability

- Great for cleaning, stripping and buffing hard floors
- Can also be used on carpet
- 1.0 HP TEFC AC motor; 13-inch cleaning path
- 50-foot, 14-3 commercial power cord
- Pad driver and clutch plate included

- Quiet 68.5 dBA noise level
- Outstanding water recovery
- 1.0 HP brush motor
- 10.5-gallon solution tank; 15-gallon recovery tank

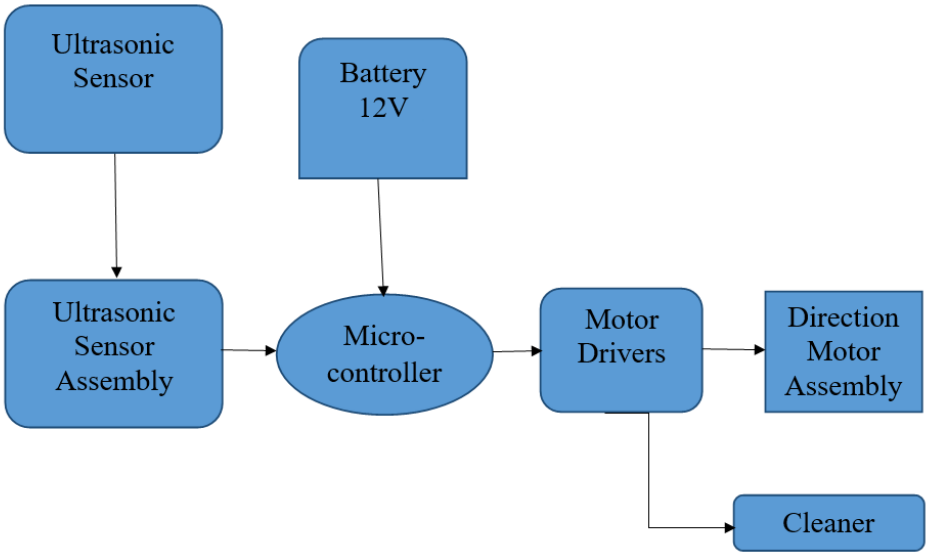
IJIREEICE ISSN (O) 2321-2004, ISSN (P) 2321-5526

International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.047 ⁜ Vol. 10, Issue 7, July 2022

DOI: 10.17148/IJIREEICE.2022.10708

Block Diagram



IV. WORKING

It is the process of using different components to make the whole machinery process operate automatically. We may use micro-controller, image sensing technique for achieving desired motion. Especially when different types of motions are involved the process become very much complicated and need different algorithm for optimum movement of the system. Again when different power sources are used and they have to be operated at different time microcontroller is essential. In our case the purpose of the micro-controller is to make all the systems work in proper sequence and move according to the image sensed. Image sensing is basically achieved by ultrasonic sensors.These type of sensors work according to the passive type of sensory circuit. This system sends ultrasonic range wave and the wave reflects after encountering any obstacle. This retraced wave is sensed by the sensory circuit which there by calculates the distance of the obstacle. The data achieved from this process is processed for the future movement of the machine.

MERITS:

- This cleaner is more efficient clean than what a traditional mop and bucket can offer.
- Less man power will be required.
- Required less time to clean floor.
- Less human effort.
- To save time and effort.
- To saving the labour cost.

Applications:

The floor cleaning machine is widely used in following places:-

- Hospitals
- Colleges
- Industrial floors
- Airports, Offices
- Hotels
- Commercial Complexes
- Dairies, Laboratories

V. CONCLUSION

Automatic floor cleaner is a system that enables cleaning of the floor by the help of highly stabilized and rapidly functionalized electronic and mechanical control system. Current project work targets four wheels and moving left, right, front and back sides by using the single front wheel by the help of ultrasonic sensor micro controller. The old model just only moving forward and backward motion by manually. This is the main advantage our project.

DOI: 10.17148/IJIREEICE.2022.10708

REFERENCES

1. Udayakumar R., Kaliyamurthie K.P., Khanaa, Thooyamani K.P., Data mining a boon: Predictive system for university topper women in academia, World Applied Sciences Journal, v-29, i-14, pp-86-90, 2014.
2. Kaliyamurthie K.P., Parameswari D., Udayakumar R., QOS aware privacy preserving location monitoring in wireless sensor network, Indian Journal of Science and Technology, v-6, i-SUPPL5, pp-4648-4652, 2013.
3. Kumar J., Satish Kumar K., Dayakar P., Effect of microsilica on high strength concrete, International Journal of Applied Engineering Research, v-9, i-22, pp-5427-5432, 2014.
4. Dayakar P., Vijay Ruthrapathi G., Prakesh J., Management of bio-medical waste, International Journal of Applied Engineering Research, v-9, i-22, pp-5518 5526,2014.
5. Iyappan L., Dayakar P., Identification of landslide prone zone for coonoortalukusing spatialtechnology, International Journal of Applied Engineering Research, v- 9, i-22, pp5724-5732, 2014. Swaminathan N., Dayakar P., Resource optimization in construction project, International Journal of Applied Engineering Research, v-9, i-22, pp-5546-5551, 201
6. "Mechatronics"Appu Kuttam, Oxford Publications, 1st Edition.
7. Mechanical System Design",S.P.Patil, Jaico Publication House,New Delhi,2nd Edition.
8. "Mechatronics: Integrated Mechanical Electronic System", Ramchandran , Willey India,1st Edition.