

Design And Fabrication of Advanced Mechanism for Indian Toilet Dome Cleaning with Multi Washer's Assembly

Anil C. Gawande, Shivani Telrandhe ,Ashwin Satone, Prasad Kade

*Assistant Professor, Student
Mechanical Engineering Dept.*

D.M.I.E.T.R Wardha

ashwinsatone@gmail.com, Kdprasad.162@gmail.com

Abstract- As we know, there are many cleaning washrooms provided by the authority in the rural and urban areas but because of limited number of resources it is not possible to maintain all the cleaning assemblies from all areas so because of this we lag to maintain cleaning in these areas so all the things taken into consideration here decided to work on cleaning in washrooms of rural and urban areas. Here decided to work on a mechanism i.e. Fabrication of Advanced controlled Indian toilet sheet cleaning system.

1. INTRODUCTION

According to Swaccha Bharat Abhiyan. This project will be helpful for cleaning of washrooms where there is no provision of any cleaning assembly so it will be easier to place cleaning assembly with low cost, effective, power optimistic and less maintenance. This project uses rack and pinion arrangement along with washer to clean complete

system. Here is another assembly i.e. cleaning of dome with the help of some motors. This system uses high torque motor to clean complete floor. This complete system is power saving system and with the help of limited time it is possible. This system is cost optimistic and with the help of limited source it is possible to maintain all the things. This project will be useful at home, schools, colleges, hospitals, companies, factories and anywhere workplace.

2. LITERATURE REVIEW

- I. With the advancement of technology, robots are getting more attention of researchers to make life of mankind comfortable. This paper presents the design, development and fabrication of prototype Smart Floor Cleaning Robot (CLEAR) using IEEE Standard 1621 (IEEE Standard for User Interface Elements in Power Control of Electronic Devices employed in Office/Consumer Environments). Subject machine works in self operated mode as well as in manual method along with other features like planning for specific time and bagless dust container with auto-dirt disposal mechanism. This work can be very useful in improving life style of mankind
- II. Manual work is overcome by the robot technology and many of the related robot appliances are being used widely. Here represents the technology that proposed the working of robot for Floor cleaning. This floor cleaner robot can work in any of two modes i. e. "Automatic and Manual". All hardware and

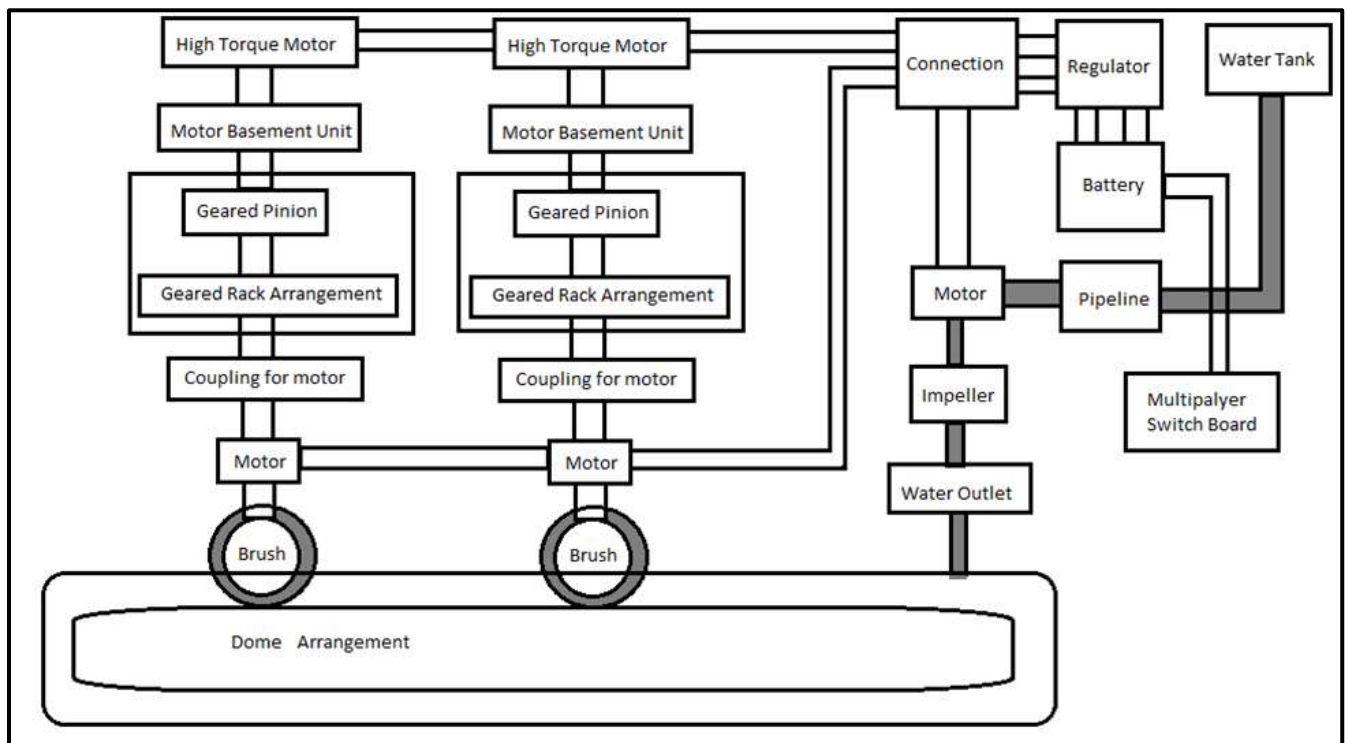
software operations are assisted by AT89S52 microcontroller. This robot facilitates sweeping and mopping task. RF modules have been used for wireless communication between remote (manual mode) and robot and having range 50m. This robot is inbuilt with IR sensor for obstacle detection and automatic water sprayer pump. Four motors are used, two for cleaning, one for water pump and one for wheels. Dual relay circuit used extensively to drive the motors one for water pump and another for cleaner. In previous work, there was no automatic water sprayer executed and works only in automatic mode. In the automatic mode machine control all the operations itself and change the lane in case of difficulty detection and moves back. In the manual mode, the keypad is used to perform the desired task and to operate robot. In manual mode, RF component has been used to pass on and receive the information between remote and robot and display the information

related to the hurdle exposure on LCD. The whole circuitry is connected with 12V battery.

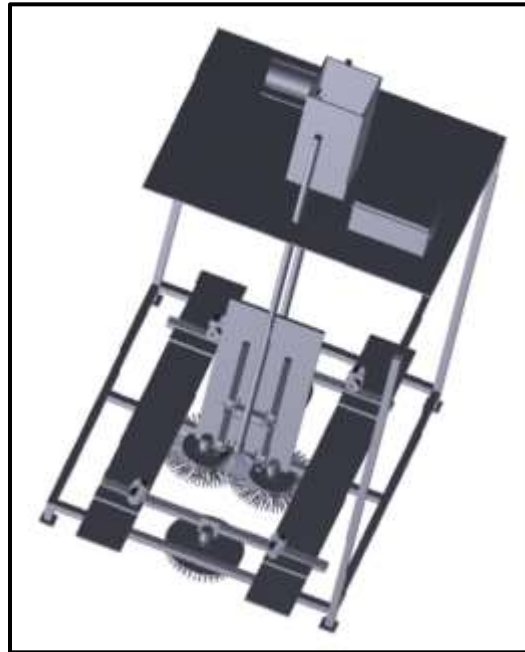
III. household service robots have long been a staple of science fiction and commercial visions of the future. Until recently, we have only been able to speculate about what the experience of using such a device might be. Current domestic service robots, introduced as consumer products, allow us to make this vision a reality. This paper presents ethnographic research on the actual use of these products, to provide a grounded

understanding of how design can influence human-robot interaction in the home. We used an ecological approach to broadly explore the use of this technology in this context, and to determine how an autonomous, mobile robot might "fit" into such a space. We offer initial implications for the design of these products: first, the way the technology is introduced is critical; second, the use of the technology becomes social; and third, that ideally, homes and domestic service robots must accept to each other.

3.BLOCK DIAGRAM



4. CAD MODEL



4.1 WORKING OF TOILET CLEANING MODEL

This system operates on the battery having size 12 volt and 8 amperes. This system involves two different Rack and pinion mechanisms for dome cleaning system and third additional mechanism for water controlling. We are having total 9 motors, out of them 4 motors for vertical to and fro movement, and 4 motors for foot rest cleaning, and 1 motor for water controlling.

There are total 5 switches to control 5 different operations are as follows: -

- Basement Cleaning
- Water Flow

5. COMPARATIVE ANALYSIS

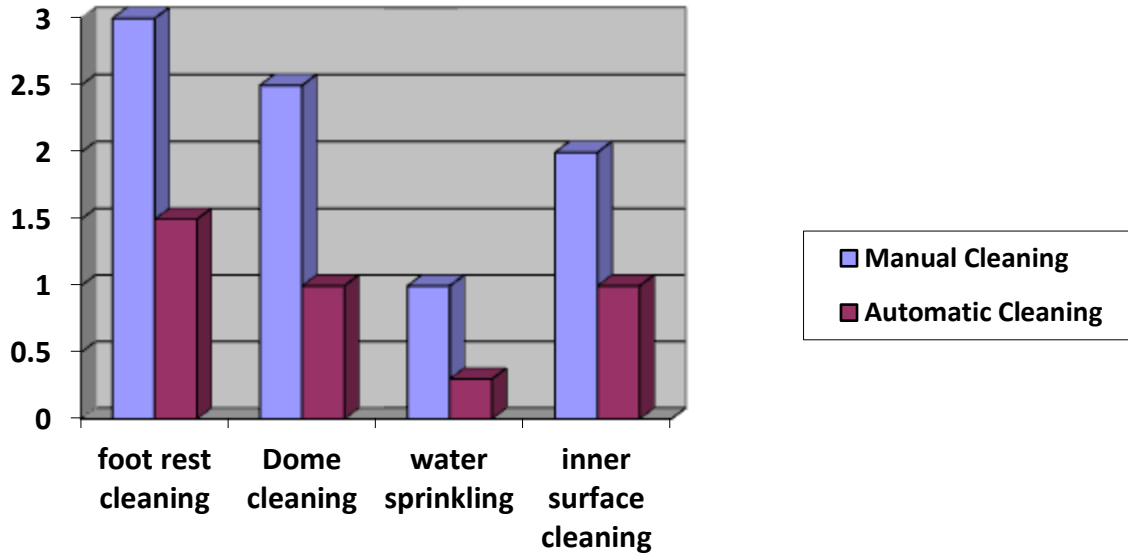
- Location: - college workshop washroom
- Sweeper Name: - XYZ

- Two to and Fro movement
- 360⁰ Rotation

When the extreme left switch belonging to basement cleaning is pressed ON, it facilitates both rotational as well as horizontal movement for foot rest cleaning. Adjacent switch belonging to water control is pressed ON then it sprinkles the water over the surface area of a sheet. To and Fro vertical movement are controlled by 3rd and 4th switch to facilitate dome cleaning. And extreme Right Switch is used for 360⁰ rotation of inside brushes.

S.NO	OPERATION	TIME FOR MANUAL OPERATION	TIME FOR AUTOMATIC OPERATION
1	Foot Rest Cleaning	3 min	1.5-2 min
2	Dome Cleaning	2.5 min	1-1.5 min
3	Water Sprinkling	1 min	0.3-1.5 sec
4	Inner surface cleaning	2 min	1-1.3 min

5.1 Graphical Representation



5.2 CONCLUSION

In this way, we completed work and mathematical modeling of **advanced mechanism for Indian toilet dome cleaning with multi washer's assembly** as well as addressed the issue of manual scavenging. Fabricated model entitles following purposes: -

- Time consumption by every operation is significantly reduced.
- Lack of availability of labor is overcome.
- Used for remote areas where electricity is not easily available in public toilet.

REFERENCES

- [1]Irobot.com,"iRobot Corporation: We Are the Robot Company', 2015. [Online] Available: <http://www.irobot.com/>.
- [2]Neato,"Neato Robotics I Smartest, Most Powerful, Best Robot Vacuum", 2015 [Online] Available: <http://www.neatorobotics.com/>.
- [3]Dyson.com, Latest Dyson Vacuum Cleaner Technology I Dyson.com', 2015. [Online] Available: <http://www.dyson.com/vacuum-cleaners.aspx>.
- [4]Buck, the Best Robot Vacuums of 2015| Top Ten Reviews', Top Ten REVIEWS, 2014. [Online] Available: <http://robot-vacuum-review.toptenreviews.com/>.
- [5]Manreet Kaur, Preeti Abrol "Design and Development of Floor Cleaner Robot Automatic and Manual) "International Journal of Computer Applications (0975 -8887) Volume 97-No.19, July 20
- [6]Bhandari, B.V. (1994) Design of Machine Elements, India, Tata McGraw-Hill Education. pp. 400-500
- [7]Shigley, E.J. (1963) Mechanical Engineering Design, India, Tata McGraw-Hill Education. pp. 500-600.