

Design and Development of Automatic Floor Cleaning Machine

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Abstract: *A Cleaning is the essential duty in our day to day life. Cleaning of floor is a very important for our health and reduces the human power. Robotics is a valuable educational tool that introduces students to a variety of different engineering disciplines such as electrical, computer, and mechanical engineering. In order to prove that this work can be accomplished an autonomous Floor robot was designed and built and describes the development of a Floor cleaning machine robot prototype. There is a 2"x3" circuit board used for the body of our robot, and the total size of the robot is about 6 inches in width and 8 inches in length. The height of our robot is about 4 inches. A mini portable Floor cleaning machine is attached in back of the chassis and we put the IR sensors on the front of the chassis that we used to detect the obstacles when the robot is moving. Most of the domestic robots are entering in the people daily life, but it is immature in the market. Automatic floor cleaners are nothing new, but they all share a common problem. They all are too expensive for what they do. Today, we will make an Automatic Home cleaning Robot that only costs a small fraction of the ones in the market*

Keywords: Bayawa transform, Integral Transform and Differential Equations

I. INTRODUCTION

Robot is an electromechanical machine and used for various purpose in industrial and domestic applications. Cleaning an indoor is a practical problem whose solution involves all the basic research areas in robotics and lots of common sense. In this research floor cleaning robot is based on ATmega328P has been developed. This robot is an electric home appliance, which works in two modes as per the user convenience "Automatic and Manual". This is not a vacuum cleaner robot and it performs wet and dry cleaning operation. It works on 12V supply. In automatic mode, robot performs all tasks individually. First robot starts it moves forward and performs cleaning operation. If any object detected, the robot change the pathway automatically, does not stop and starts cleaning operation. Manual mode is performed with the help of a Bluetooth module., which gives 50m and 100m range. Motor driver circuit have been used to drive the motors. Two motors are used to drive the robot in four directions. LM293D IC has been used to drive wheel motor. Relays have been used to drive the water pump and cleaner motor. In the manual mode, user itself operates the robot.

II. METHODOLOGY

Usually robots of this kind can cost more making it an unaffordable choice. At the same time this economical robotic floor cleaner has been designed mainly keeping the price margin in mind. As a result, a most efficient and agile cleaning system is developed to attain perfect cleaning rather than satisfactory cleaning achieved by a pre-existing extravagant machine. In fig.3.1 shows this project resulted in the outcome of exhaustive research and comparisons with the conventional designs and performances of various kinds and make. Supervisory control over these gadgets is made so simple and cost efficient without reduction in performance

III. LITERATURE REVIEW

S.NO	NAME OF AUTHOR	TITLE OF PAPER	OUTCOMES
1	JIANNAN ZHU, YIXIN YANG , YUWEI CHENG	FULLY AUTONOMOUS WATER SURFACE CLEANING ROBOT WITH A NOVEL COVERAGE PATH PLANNING METHOD	In this paper, we designed a novel autonomous water surface waste cleaning robot, SMURF, which can replace humans for surface cleaning.
2	Zhai Yuyi, Zhou Yu, Luo Huanxin, Liu Yunji, Liu Liang	CONTROL SYSTEM DESIGN FOR A SURFACE CLEANING ROBOT	Surface cleaning robots can achieve surface cleaning operation activities under the control of the host computer and achieve good control effects.
3	A.S. SHIRKANDE, CHAVAN ANIKET NITIN, BHOSALE GORAKH SUDAM	WIRELESS FLOOR CLEANING ROBOT	As the cleaner traverses the room, the sweeper installed in it will manage to pick up a significant amount of dirt.

Material Selection

Sn. No.	Part Name	Material	Specification
1	Chasis	Steel Angle IS:808-1989	Angle 35×35×425ISF3
2	Crank	Mild Steel B.S.10720.1983	
3	Rod		
4	Wiper		
5	Handle		
6	Roller	AISI52100 (Crome Steel)	Hardness- 60-64 Rc

Chasis

The supporting frame of a structure (such as an automobile or television) Leaf springs are attached to the car's chassis. also : the frame and working parts (as of an automobile or electronic device) exclusive of the body or housing.

Crank shaft

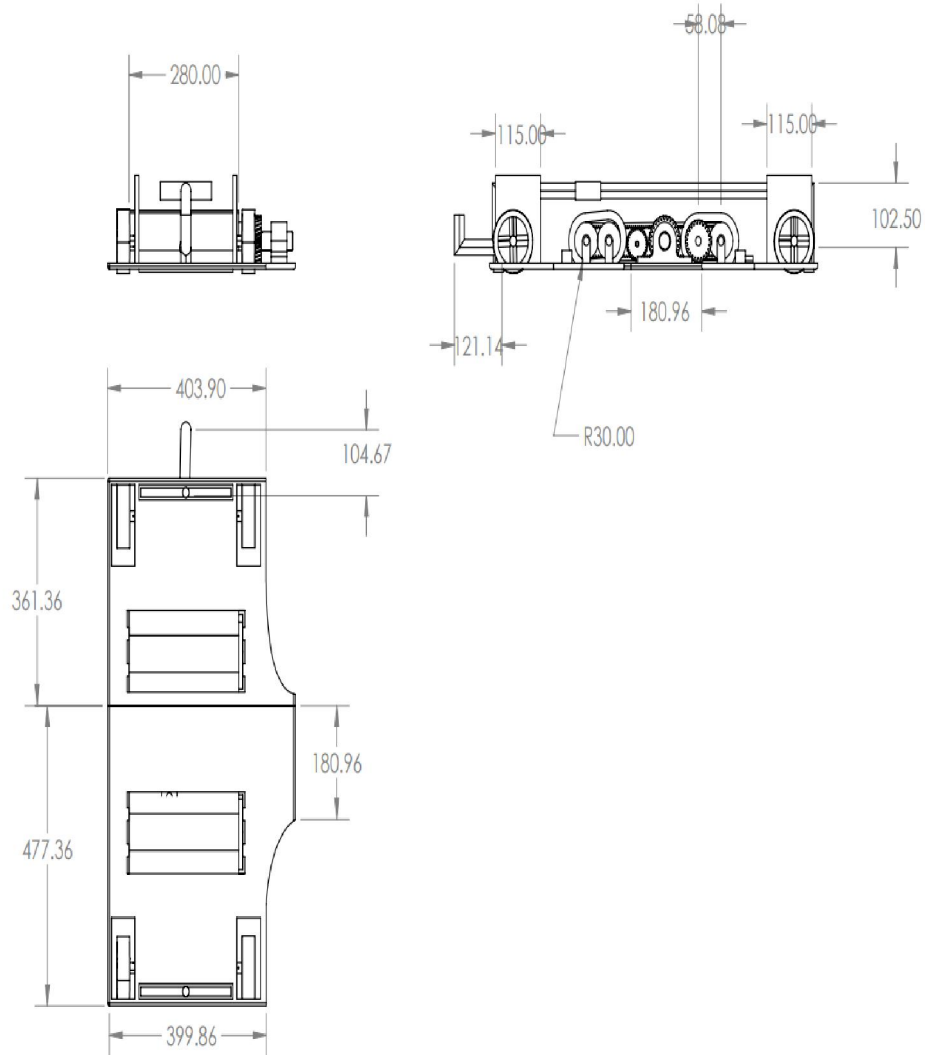
A crankshaft is a mechanical component used in a piston engine to convert the reciprocating motion into rotational motion. The crankshaft is a rotating shaft containing one or more crankpins, that are driven by the pistons via the connecting

WIPER

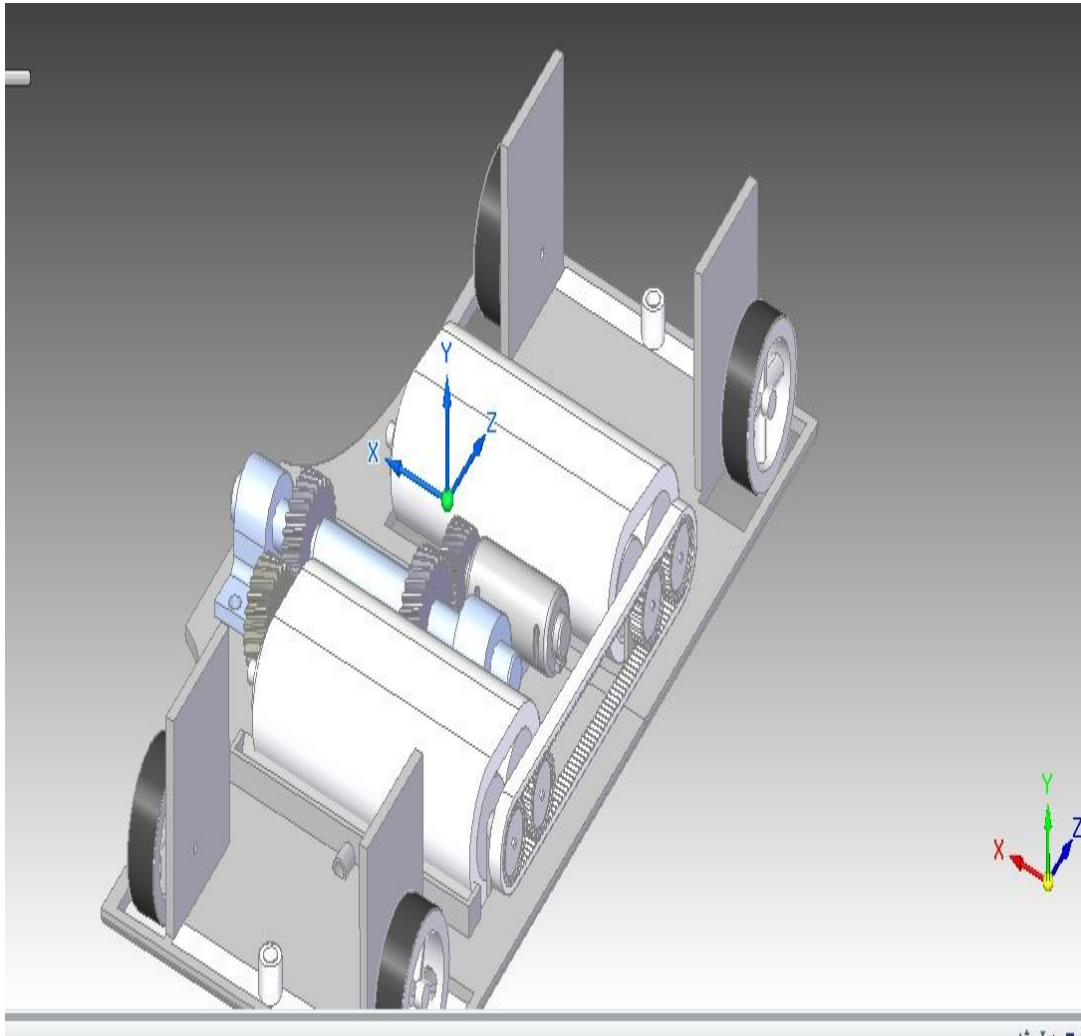
A moving contact for making connections with the terminals of an electrical device (such as a rheostat) c. : a usually motor-driven arm with a flexible blade for wiping a window (such as the windshield of an automobile or airplane)



2D-DIAGRAM



3D DIAGRAM



IV. CONCLUSION

This robot works in two modes automatic and manual for user convenience. This proposed work provides the hurdle detection in case of any obstacle that comes in its way. An automatic water sprayer is attached which sprays water for mopping purpose for the convenience of user. User can also operate this robot manually with the help of Smartphone. It reduces the labour cost and saves time also and provides efficient cleaning.

In automatic mode, the robot operates autonomously. The operations such as sweeping, mopping and changing the path in case of hurdle are performed automatically.

A cheaper and user friendly automatic wet and dry floor cleaning robot can be developed with two different mode of controlling (Manual and Autonomous) using an Arduino controller with obstacle sensing functionality. With simple design and program, the cleaner will be able to cover large floor areas as well as find its way into and out of small corners easily..

As the robot traverses the room, the mop installed in it will manage to pick up a significant amount of dirt. Manual sweeping might not be that effective as it will not be picking up everything in as it is not in sight but using the automatic As the robot traverses the room, the mop installed in it will manage to pick up a significant amount of dirt. Manual sweeping might not be that effective as it will not be picking up everything in as it is not in sight but using the automatic floor cleaner it can be done easily

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