

Robot Controlled Vacuum Cleaner

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ABSTRACT:

In our project we are eliminating the need of manually collecting the scrap in heavy industries. For purpose we are designing Robot controlled vacuum cleaner controlled by microprocessor controller. In the available methods of scrap collecting manpower, fuel power vehicle is used. By the end of 2020, fuel deposit in the world completely depleted. To avoid this type of problems and reduce manpower requirement we need other type of automation is called battery operated ROBOT CONTROLLED VACUUM CLEANER. The microcontroller is used to control the vehicle path automatically. The rechargeable battery is supplying power to the automatic scrap collecting. The vehicle is having the one magnetic roller which is used to collect the scrap automatically.

INTRODUCTION:

Under roof. Path programmed for the VEHICLE in a micro controller chip can be altered when required. The vehicle is having the one magnetic roller which is used to collect the scrap automatically. We have pleasure in introducing our new project "ROBOT CONTROLLED VACUUM CLEANER", which is equipped by micro controller, motor driving mechanism and battery. The power stored in the battery is used to drive the DC motor that causes the movement to VEHICLE. The speed of rotation of DC motor i.e., velocity of Vehicle is controlled by the microprocessor controller. The existing Vehicle, pallet trucks, trolley use petrol or diesel as fuel for running and for operating them we use the manpower. These types of vehicles consume liter of fuel for a period of one hour.

For overcoming this we designed vehicle which is drawn power from the storage battery. The power stored in the battery is used to drive the DC motor that causes the movement to vehicle. The speed of rotation of DC motor i.e., velocity of vehicle is controlled by the microprocessor controller. Battery assembled on the vehicle is easily replaceable and detachable, used for charging the battery, while the vehicle is an era of automation where it is broadly defined as replacement of manual effort by mechanical power in all degrees of automation. The operation remains an essential part of the system although with changing demands on physical input as the degree of mechanization is increased. Degrees of automation are of two types, viz.

- Full automation.
- Semi automation.

In semi automation a combination of manual effort and mechanical power is required whereas in full automation human participation is very negligible.

1.1 NEED FOR AUTOMATION:

Automation can be achieved through computers, hydraulics, pneumatics, robotics, etc., of these sources, pneumatics form an attractive medium for low cost automation. The main advantages of all pneumatic systems are economy and simplicity. Automation plays an important role in mass production. The machines designed for producing a particular product are called transfer machines. For mass production of the product, the machining operations decide the sequence of machining.

The components must be moved automatically from the bins to various machines sequentially and the final component can be placed separately for packaging. Materials can also be repeatedly transferred from the moving conveyors to the work place and vice versa. Nowadays almost all the manufacturing process is being atomized in order to deliver the products at a faster rate. The manufacturing operation is being atomized for the following reasons

- To achieve mass production
- To reduce man power
- To increase the efficiency of the plant
- To reduce the work load
- To reduce the production cost

WORKING PRINCIPLE:

The straight line motion drive is provided by the DC motor fixed at the rear wheel shaft of ROBOT CONTROLLED VACUUM CLEANER. The supply of the current is given by the battery provided on the sheet metal. The stored energy from the battery is supplied to D.C motor. The straight line movement of the robot controlled vacuum cleaner is done by the d.c motor (12 V/ 2A). The motor is fixed at the rear wheel shaft of the robot controlled vacuum cleaner. The supply to the motor is given by battery (12 V/7 Ah). This battery also gives the supply of current to the microcontroller.

The already energy stored in battery is sent to d.c motor control circuit. The d.c motor works according to the program written on the microcontroller chip. (i.e.) robot controlled vacuum cleaner moves to a distance of specified value and at that instant power supply to d.c motor is cut off and again a power supply is given to the d.c motor so that the robot controlled vacuum cleaner moves in a curved path.

So the specified path which is needed for us is obtained by the above procedure. In our project lead-acid battery is used. The lead-acid batteries output is given to the control unit. Control unit having four relays, they are connected to the two D.C motor in Forward and reverse rotation of operation.

- Relay 1 - Forward Direction
- Relay 2 - Reverse Direction
- Relay 3 - Left Turn
- Relay 4 - Right Turn

At first vehicle is moving in forward direction when the switch is on. The path is already programmed in a control unit. Then the control unit activates the proper relay so that the vehicle moves in forward direction for particular time period. Then the vehicle turns in left direction for particular time period. Then the vehicle turns right for particular time period. The straight line motion is provided in the back wheel drive with the help of spur gear mechanism. The straight line movement of the robot controlled vacuum cleaner is done by the d.c motor (12 V/ 2A). The motor is fixed at the rear wheel shaft of the robot controlled vacuum cleaner with the help of proper arrangement. The Left/Right motion is provided in the front wheel drive with the help of rack and pinion mechanism. The left/right movement of the ROBOT CONTROLLED VACUUM CLEANER is done by another d.c motor (12 V/ 2A). The motor is fixed at the front wheel shaft of the robot controlled vacuum cleaner with the help of proper arrangement.

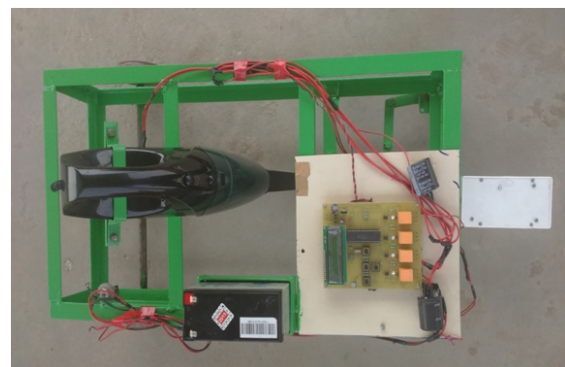
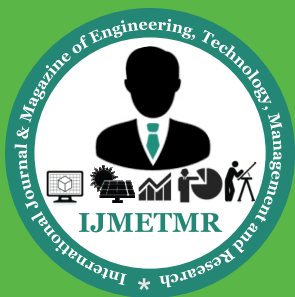


Fig 3.1 overview of total assembly

Result:

Finally efficiency obtained could be further improvement by adding solar panel, so that increasing efficiency of the Robot controlled vacuum cleaner. By selecting suitable material we can increase the efficiency. This is very useful in all industries material handling department. The man power requirement in the industries is reduced by adding Robot controlled vacuum cleaner.



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