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Review on Magnetic Burr Collecting Machine with Oil Soak Mop System

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Abstract:

The intention of this Mechanical Engineering project is to fabricate a scrap collecting machine. Since complete automation is very complex and even research facilities haven't come up with one you better design one that is operated permanent rod magnets. The automatic scrap collecting machine is designed to remove metal scraps from the work station to the disposal area with the help of Magnet and Photoelectric sensor. The use of this automated vehicle system reduces human efforts and the chances of hazard. The collecting work station consists of the work room, conveyors and iron shattering machine. The big iron scraps from the work area is collected by a conveyor and is brought to an iron shattering machine to reduce its size. This shattered iron scraps are brought away from the machine to the rail module through a conveyor for disposal. Another problem faced is that of oil spillage which is adding to un-safety on the travel or transit path in industry which needs to be cleaned. The machine is also fitted with an oil cleaner mop which will soak the oil in its location without spreading it improving the safety of the road.

Key Words: *Scrap, Oil Cleaner mop, Conveyor Belt, Motor, Proximity Sensor*

I. Introduction:

Technology advance in today's life for industrial world drive major research focused for safety of manufacturing environment. Then metal burr produces during machining operation. The metal burr spread on the workshop floor. The method employed currently in industries to collect the metal burr includes, picking pieces by hand and manual sweeping both methods are not been effective due to. Consuming and expose the worker to injuries for safety. A modern machining industry has led to the development of technology driven burr collector. Which work with the scientific principles of magnet. The magnetic burr machine is used to

collect the magnetic burr in industry or Workshop, Factory, Roadways, Scrap yards and so on. The developed magnetic burr collector replaces human labor for collecting the ferrous metal parts and can operate at faster rate by an. unskilled labor irrespective of age and technical qualification. The mop system is used to collect the spread oil on the floor in the industries. The primary target of the mop system is the design and proof of concept of autonomous cable of mitigating and eliminating the threat arising from oil spill incidents.

The scrap collecting machine is used for making scrap out of any place. We make a machine which collects the whole scrap into a place. This robot is 4 wheeled Though this project may sometimes look simply in this project we will control this machine or vehicle with infrared sensor remote. We will control different functions of moving robot. As we know the value of robotics it can be used in biomedical industry, domestic, food, leather, auto parts etc. In this project we will make remote which will have functions to control robot like forward, backward, right and left.

II. Literature review:

Sirichai Watanasophon and Sarinee Ouitrakul were represented Aim of this research is to design and make garbage collection robot on the beach by using wireless communication. The robot is built on the caterpillar wheels sizes 52x74x17 cm and the power is supplied from 12V 30Ah battery which is connected to 40W solar cells. The user can control a robot via a program developed from Visual Basic 2005 application based on Window XP. The commands from user are sent via Bluetooth to PIC18F4550 for processing. In addition, it is also equipped with an IP camera with added pan/tilt capabilities which relays feedback information to the human operator via Ad-hoc system.

Electromagnetic Metal Collecting AGV S. Pradeep et al. presented as Scrap is one of the leading wastes generated in manufacturing industries. Collection of scrap is a tedious work and requires more labor work and is also a time consuming one. Thus, this project emphasis the importance of scrap collection and an AGV is designed to eliminate the manual scrap collection. In our project we are eliminating the need of manually collecting the scrap in heavy industries. For this purpose, we are designing an automated electromagnetic scrap collecting AGV controlled by an Arduino mega 2560 controller. Of the available methods of scrap collection techniques, manpowered and fuel powered vehicles are used. In the near future, the fuel deposits in the world will be completely depleted. To avoid this situation of problems and to reduce manpower requirements we are in need of other type of technique called as ‘battery operated automated electromagnetic scrap collecting AGV’. The Arduino mega 2560 controller 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 electromagnetic arm which is used to collect the scrap automatically.

Rakshan C. Naik et al they are published research on, “Design and Development of Magnetic Chip Collector Machine’’. They are concluded that the design and fabrication of the magnetic chip collector is tested for

practical utility in the college machine shop. The magnetic chip collector is simple in construction, mechanically driven the chips. The unskilled worker is operating the magnetic chip collector. It has easy operating and maintains cost is low. The efficiency of the developed magnetic chip collector can be improved by increasing the size and incorporating powerful magnate.

Prof. Rohidas Waykole et al they are published research on, "Electromagnetic Scrap Collecting Machine with Vacuum System''. They are concluded that Design and fabricated of electromagnetic scrap collector is successfully completed. The machine is used to collect metallic and non-metallic scrap in a specific area. The modular system can be extended to handle different types waste.

E.K. Boulougouris et al they are published research on, "Efficient Oil Spill Confrontation by Innovation Eu-Mop Units". They represented the design of oil skimming unit developed by using MOP System. This research project was funded by European was to design and validation of the concept of MOP for oil grasping the structural design, robotics oil processing is presented in paper.

III. Objectives:

To design and Selection of conveyor motor, belt for conveyor mechanism.
To determination of the magnetic force requirements and selection of rod magnets.
To design analysis of the Magnetic roller and demagnetization roller mechanism.
To design the selection of motor, mop brush and shaft for the oil clean/soak mechanism.
To testing of the magnetic burr collector for its magnetic burr collection ability, speed and weight of burr collected per minute
To testing of the oil soak / clean mop.
To selection of electric circuit for obstacle sensing and auto stop.

IV. Scope of the Project:

1. Ferrous (iron) burr collection in conventional workshops
2. Ferrous (iron) burr collection in CNC machine set ups
3. Oil spillage and dirt collection in gangways of machine shops

V. Methodology/ Planning of work:

- To design Mathematical modelling, of kinematic linkage of collector mechanism.
- To prepare2-D drawing preparation (Auto-cad 2015), 3-D modelling (UG-NX-8) and analysis of system components (ANSYS Workbench-14.5) of collector mechanism.
- To prepare 2-D drawing preparation (Auto-cad 2015), 3-D modelling (UG-NX-8) and analysis of system components (ANSYS Workbench-14.5) oil soak / clean mechanism.

- Experimental testing of the burr collector mechanism.
- To determine burr collector time per unit area.
- To determine burr collecting area per unit time.
- Experimental testing of the oil soak/ clean mechanism.
- To determine mopping time per unit area.
- To determine mopping area per unit time.

VI. Diagram:

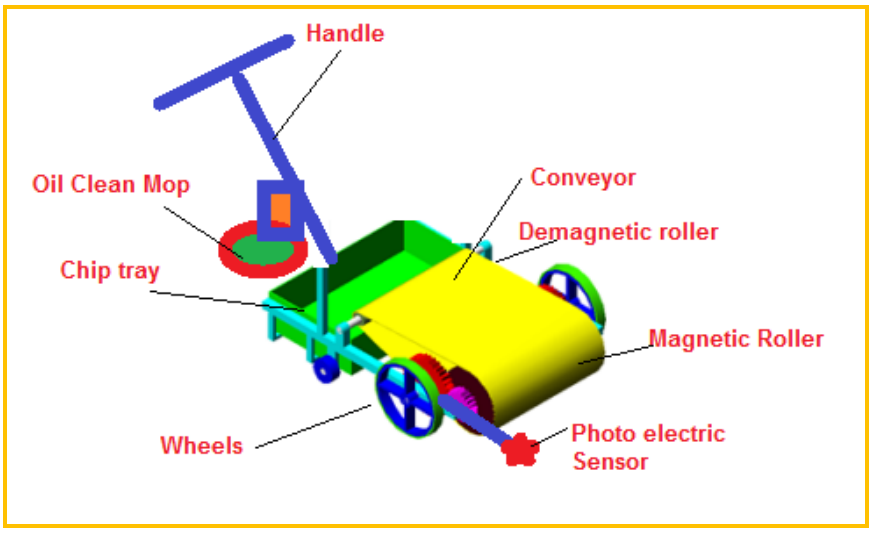

Fig 1.1 Final Concept of magnetic burr collector with oil Soak / Clean Mop

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VIII. Conclusion:

The efficiency of the developed magnetic burr collector with oil soak mop system can be improved by increasing the size and incorporating powerful magnets. This led the developed magnetic burr collector can be employed for safe manufacturing environments in industries.