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Automatic Guided Vehicle (AGV) for Scrap Collecting Vehicle

Manimaran. C[1], Tamilarasan. D[2]
[1]*Associate professor,* [2]*Student, Department of Mechanical Engineering, IFET College of Engineering, Villupuram, Tamilnadu, India.*

Abstract: ***A scrap collecting vehicle has a bucket drive mechanism. The vehicle has a scrap container that has a bin and a movable bucket for receiving scrap. The movable bucket is driven upwardly in friction contact with a side of the bin by the given mechanism. This mechanism further causes the bucket to rotate about a point for delivering scrap from the bucket into the bin. A rotatable paddle may be given for sweeping the scrap from the bucket and thus for dumping the scrap inside the bin. Such mechanism may include inclined actuators which are connected to chain rollers that run over track to raise the bucket until the chain collars reach a disposed rocker shaft that acts as a joint for pivoting the bucket.***

I. INTRODUCTION

The different types of scrap are collected in industry from the many years with the use of manual or the labors. The other mechanisms are also used for the loading and unloading purpose. Later on the scrap collecting vehicles came into application for better performance and efficiency. This bought a revolutionary change in the field of scrap collection as it was effective form of the scrap collection. A greater application of the automobile and advance in the mechanism, the automation in vehicle has led to extraction in the scrap handling in industry. These scrap collecting vehicles are now applied in handling of the scrap in the industry. Normally it's known as the automatic guided vehicles (AGV). The different kinds of mechanism are determines the classification the scrap collecting vehicles. There are two types of the scrap collecting vehicles first is the manually controlled vehicle and other one is automatically controlled vehicles.

A Project is very interesting. We are using Tsop1738 as a IR – infrared receiver. We using relay coil to collect scrap. Coil need 5 to 12v DC. Better voltage- better collecting power. Robot helps us to collect scrap from every corner and from everywhere. In this project we will control robot 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. There will be six functions.

The automatic scrap collecting vehicle is designed to remove glass scraps from the work station to the disposal area with the help of electronic sensors and a rail. The use of this automated vehicle system reduces human efforts and and the chances of hazard.

The automated scrap collecting vehicle system consists of:

A. A collecting work station
B. A rail module
C. A disposal station.



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The collecting work station consists of the work room, two conveyors and a glass shattering machine. The big glass scraps from the work area is collected by a conveyor and is brought to a glass shattering machine to reduce its size. This shattered glass scraps are brought away from the machine to the to the rail module through a conveyor for disposal. The second phase consists of a rail module and a vehicle module, the rail module for guiding the vehicle. This is disposed between the collecting work station and the disposal station.

The glass scraps are disposed in the disposal area. The whole process is automated to minimize human efforts and to attain better productivity. Please refer the attached file for more details.

II. LITERATURE SURVEY

Larisa S Grigor'eva. Foreign and domestic experience shows that to avoid the negative consequences of the formation and accumulation of construction waste can only be based on all the processes of collection management, sorting,transport and recycling, united by goals and objectives, and fit into the overall scheme of sanitary cleaning of the region. The basic principles of SB WMS are:

A. The unity of the applied methods, tools and terminology;
B. Streamlining and standardization of all forms of document;
C. The formation of unified organizational and technological and economical solutions;
D. required pursuant to all participants in the system.

Thus, the proposed model of construction waste management system makes it possible to predict their stable values for the planned time period for the entire range. Such calculations are necessary as construction companies and planners to address a wide range of issues of preparation and implementation of activities to build additional capacity of processing industries, linking the activity of construction and transport organizations, as well as appropriate planning and regulations on the organization and improve the processing of the control system building waste.

C.H. Chen, This study designed and developed a GTFMS with an optimised power-saving mechanism for updating messages based on location information. In addition, an arrival time forecasting method was designed and implemented in the FMS, where the GTA can retrieve the forecasted arrival time and the message updating event is triggered, using the location of the garbage truck and its forecasted arrival time. During experiments, the practical records of garbage truck traces in Hsinchu City from the 1st of April to the 31st of October were collected and analysed. The results showed that the mean accuracy of the predicted arrival time by the proposed method is 81.45 per cent. As to power consumption, the cost of traditional mobile apps is 2,880 times that of the proposed mechanism. Consequently, the GTFMS can provide a precise forecasted arrival time to mobile users, while saving power consumption.

Ganesh Laxman Bhat New process, rotation of bins helps to carry the garbage periodically without much effort. This improves the efficiency of collection system and keeps the neighborhood clean and pollution free. To lift the bin while transferring garbage to Truck-compactors. Overall this product helps to reduce the time and effort in collection of garbage from residential and apartment areas.

TE Kanchanabhan In the present study, an attempt was made to design and develop an appropriate storage and collection plan for the Pallavapuram municipality corporation of Tamil Nadu, India. The model proposed was designed to plan the allocation of waste bins and a route network using GIS and VTU for the study area. In the proposed system, leachate is to be contained within the HCS recommended and should not leak from the container which would prevent littering of waste during transportation. Furthermore the HCS containers are easy to clean and maintain and also look better than SCS (Naresh Kumar and SudhaGoel 2009). The movable containers to be used in the proposed system have a total capacity of 2.5m3 with hydraulic loading/unloading attachments. The waste collected by the tricycle carts is to be unloaded directly into the respective chambers of the bins. The labour requirement is also less than in the existing system (one driver and one cleaner required in HCS in comparison with one driver and five to six collection laborer in SCS).

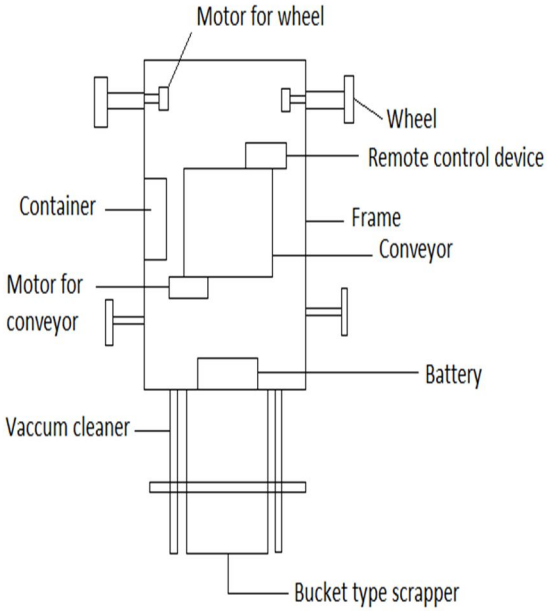
Surajgavali I have observed from different research paper and analysis that the main focus ofthe previous research are on the framework of garbage collection system i.e.,

a) On the ways and methods of garbage collection.
b) On the means of transformation of garbage from one place to another place.

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But the very less focus on compactor. As there is increasing garbage with increasing population. In order to handle increase garbage there is need of efficient and effective compactors. So my project is focused on design, manufacturing, and analysis of compactor.
Insung Hong In this paper, we proposed an IoT-based SGS for replacing existing RFID-based garbage collection systems. To provide differentiation from passive collection bins and other types of RFID-based food garbage collection systems, we also proposed components required in external and public environments and designed the SGS based on these components. The basic system structure of a SGB is a centralized structure in which information gathered in each bin is transferred to the server; we also designed a HSGB for improving the battery efficiency of each SGB.

Design of scrap collecting vehicle



1) *Components:* The scrap collecting vehicle consist of various components are as followed
a) 12v DC motor
b) Rolling brush
c) Conveyor belt
d) 1’’sq ft,pine
e) 12v & 7amp battery
f) Wire
g) Pulley
h) 16mm & 1mm MS Shaft
i) Bearing
j) Screw & bolt

2) *Mechanism:* Scrap collecting vehicle is to collect the different types of the scrap from the industries and as similar to the refuse collector for the garbage collector or the collection of scrap. The scrap bins are the principal object for the simple operation, efficient in operation, economic to environment and easy to operate. scrap or garbage of the industries include the plastics, metals and other kinds of the wooden or rubber material. So, the mechanism is capable of collect and separate these all kind of plastic, metal, wooden and rubber scrap. as described the mechanism is mounted on the side of the vehicle. That is responsive in the movement to the usual scrap bins feeding movement of the scrap. The provision of the side attachment of the vehicle which fully responsive to all of the movement of the usual scrap collection from the bins. It doesn't depend on the type of the scrap but, it will depend upon the weight of the scrap and the whole lot. The loading of the scrap from industries or door to door

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garbage and scrap collection with the provision of side attachment. So, the single operator can able to drive the vehicle as well as the mechanism manually without comes out from the drivers cabin. The provision of this attachment is quickly operated by any non-skilled person

3) *Working Principle:* Firstly vehicle starts and it can be moved forward, reverse, right and left according to our requirements and perform cleaning action. And we can turn on the scrap collecting machine as per the necessities. IR (Infrared) module has been used to transmit and receive the signal to operate the robot through remote. This robot can perform sweeping and scrap collecting tasks. IR modules have been used for wireless communication between remote (manual mode) and robot and having range 20m.

4) *Benefits Of Recycling Scrap Metals*

a) 75% saving in energy
b) 90% savings in raw materials used
c) 86% reduction in air pollution
d) 40% reduction in water use
e) 76% reduction in water pollution
f) 97% reduction in mining wastes

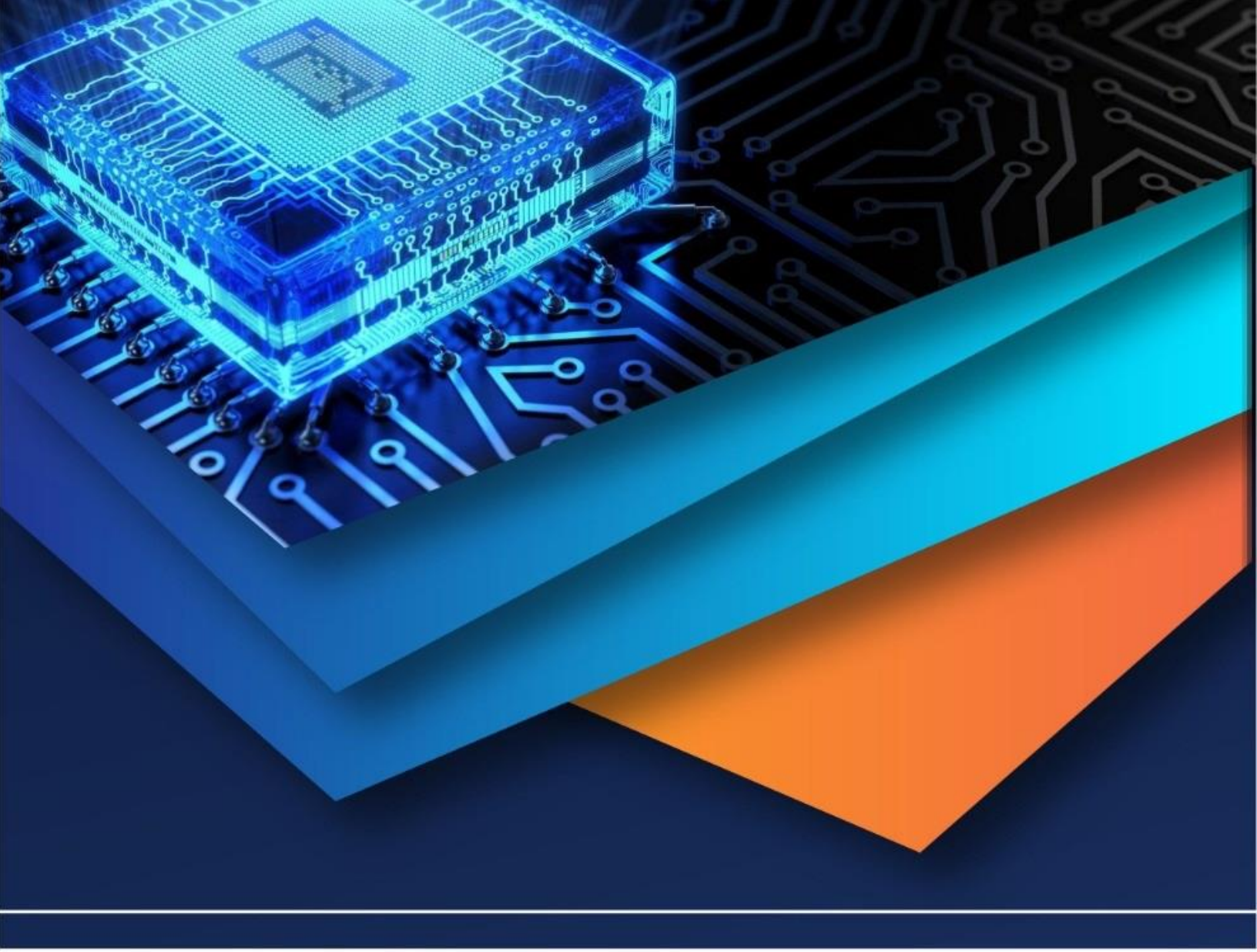
III. CONCLUSION

The different mechanism of scrap collection are semi-automated controlled as above with side attachment would result in increasing the work efficiency and this would lead to automation for the time saving. More amount of operation can be done in short time with a single operator for vehicle as well as the mechanism. Now due to these automation will be comparatively more percentage of less time consumption from the same quantity of scrap collection as compared to manually controlled vehicles. So the arrangement of this design with a core features such as the belt drive and guide post with the collecting arms would provide us high quantity of the torque from the electric motor as compared to other mechanism. Thus, adopting the above design would be beneficial in all terms instead of manually controlled vehicles.

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