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Self Driving Load Carrier

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Abstract: *This project introduces an "Automatic remote control material handling trolley robot" is to developed by to carry any book's and parcel in collage library or other places from one to another place easily no damage to the parcels and materials. The robot is basically works on the principle of line follower robot and relay logic system. The robot is to be control the motor rotation via remote control. Firstly we press number button of remote control the relay will be RF based remote control circuit operated .The circuit are classified as one transmitter and receiver, in transmitter circuit 1to 8number of remote control are used to transmit particular signal through wireless, then operate receiver side receive signal and operate particular relay in receiver. In receiver circuit relay provide supply line follower or obstacle circuit are fitted to robot body and can be driven any of four directions like left, right, forward, back. and the robot trace black line on ground surface and also detect obstacle in front direction thane after robot stop and give the alarm. This robot will be installed in collage library for books are traveling one place to another easily and robot also applicable for the industry, shopping mall to travel small weight up to 25kg*

Keywords: Automatic remote control material handling trolley robot

I. INTRODUCTION

Material handling has always been the issue in big scale industries as it consumes much human labour and it wastes precious man hours which can be used elsewhere much more productively. It also leads to waste of energy and resources. To reduce the labour and save time material handling robots are issued which gives a lot of flexibility to the organization as it increases the productivity of the entire organization. Automatic or self driving Vehicles abbreviated as AGV are used in such a system

The efficiency of a container terminal is directly related to the amount of the time each vessel spends in the port. Advanced technologies, and in particular automated guided vehicle systems, have been recently proposed as possible candidates for improving the terminal's efficiency not only due to their abilities of significantly improving the performance but also to the repetitive nature of operations in container terminals. To our knowledge, this is the first instance of an AGV that has operated successfully in a relevant environment for an extended period of time without relying on any expensive systems. These vehicles have successfully used strategies of deliberately structuring the environment and adapting the process to the automation.

AGVs have been operating successfully in factories for decades. These vehicles have successfully used strategies of deliberately structuring the environment and adapting the process to the automation. The objective of this project is to develop automated guided vehicles systems that autonomously transport material from loading to unloading stations but our teams have been designing new AGVs with more maximizing productivity across industry. The potential of robot technology to increase the intelligence and adaptability of AGVs is largely unexploited in contemporary commercially-available vehicles. AGVs are increasingly becoming the popular mode of container transport and factories. These unmanned vehicles are used to transfer containers between two or more destination.

In part, the historical success of these vehicles has been based on a strategy of exploiting the valid assumptions of structured indoor environments. Such assumptions include mostly flat floors and the assumed availability of infrastructure that is provided to support vehicle guidance. System design elements include reducing speeds to very safe levels, centralizing movement authority, and confining the vehicles to dedicated pathways, known as guidepaths, which are kept clear of obstacles to the highest degree possible. Of course, such risk reduction comes at the cost of limitations in performance and adaptability. Contemporary AGVs rely heavily on specially installed infrastructure to determine

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their position in the facility. Such infrastructure is costly to install and modify. • The system will comprise of belt conveyer and screw lifting mechanism for loading and unloading. • The system will navigate with the help of remote control fitted with IR sensors. • Need for the project : 1. To reduce manual work on trolley system. 2. The system saves the time at a greater extent. 3. The system reduces the labour work

II. LITERATURE REVIEW

Design and fabrication of human following smart trolley using kinetic sensor for diverse applications, Dept. of Mechanical Engineering Muthoot Institute of Technology & Science, Kerala

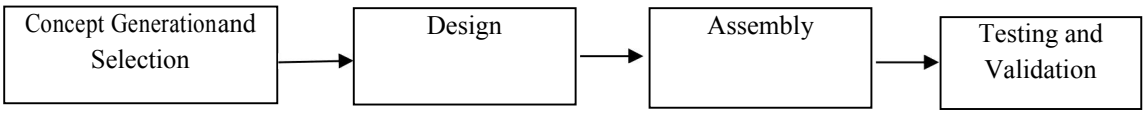
Human following smart trolley is a good alternative when compared to the conventional shopping trolleys which are being used currently in the supermarkets. Huge amount of work, time and money could be saved by the implementation of the concept. The technologies similar to the ones implemented in the work could be used in other sectors such as in Medicare field as a nurse following robot, in childcare or in material handling in manufacturing industries. The system then identifies the target to follow from the person's location and RGB colour characteristics of clothes. The threshold distance between trolley & human could be set through coding. If objects appear to be there in between that value the robot classifies it as an obstacle. Then the robot initiates the collision avoidance process. Kinetic sensor captures the movement of the human arm in real time.[1]

Follow me multifunctional automated trolley, Mechanical Engineering, Sri Lanka Institute of Information Technology Computing (Pvt) Ltd, Sri Lanka.

Follow me robot was developed to follow the customer automatically while the customer performs shopping activities in the supermarket. When customer gets the trolley it follows the customer automatically with the help of Sharp IR sensors which is fixed to the Arduino Mega board. Through the sharp IR sensor the distance will be identified within the customer and the trolley. Moreover, to identify the obstacles again the Sharp IR sensors were used. Line following methodology was used to perform the automatic parking facility. To perform this task the research group used IR sensors in order to identify the black line. Arduino UNO was used to develop the line following methodology and all the sensors were fixed to the Arduino UNO board.[2]

III. METHODOLOGY

The methodology can be understood by the following flow chart



List of components

- Body Frame Channels
- Sheet Metals
- Ultrasonic Sensor
- Motor
- Motor driver
- Microcontroller
- Battery
- Charger
- IR Sensors
- Wheels
- Motor mountings
- Sensor Fittings
- PCB Board
- ON/Off Switch

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- Connecting Wires
- PVC Connectors
- Mains Power Cord
- Fitting Screws and fasteners
- Mounting Board

Working Principle

An Self driving load carrier typically refers to a device or system that is designed to transport heavy loads or goods without the need for manual intervention. There are various types of automatic load carriers used in different industries and applications, such as warehouses, factories, and logistics.

Here's a general overview of how an automatic load carrier might work:

- Navigation and Positioning: The load carrier is equipped with sensors and navigation systems to determine its position and navigate through the environment. This can be achieved through technologies like laser scanners, or computer vision.
- Load Detection and Manipulation: The carrier uses sensors or cameras to detect and identify the load it needs to transport. It may have robotic arms, conveyors, or other mechanisms to pick up and manipulate the load securely.
- Path Planning and Obstacle Avoidance: Once the load is identified, the carrier system calculates the optimal path to reach the destination while avoiding obstacles such as walls, machinery, or other objects in its way. Advanced algorithms and software are used for efficient path planning.
- Load Transportation: The load carrier moves towards the destination following the planned path. It may have wheels, tracks, or other locomotion mechanisms depending on the terrain and environment it operates in. Some carriers may be autonomous vehicles capable of moving in multiple directions.
- Safety Measures: Automatic load carriers are designed with safety features to prevent accidents or damages. These may include emergency stop buttons, collision sensors, or safety barriers to ensure the well-being of workers and prevent collisions with humans or other objects.
- Communication and Integration: Load carriers often have the ability to communicate with other systems or equipment in the facility, such as warehouse management systems or conveyor belts. This enables seamless integration into existing workflows and enhances overall efficiency.

It's important to note that the specific working mechanism of an automatic load carrier can vary depending on the type, size, and purpose of the carrier. Different industries may have specific requirements and technologies employed in their load carrier systems.

IV. CONCLUSION

An automatic or self driving load carrier project involves the development and implementation of a system capable of transporting heavy loads or goods without manual intervention. These projects utilize advanced technologies, such as sensors, navigation systems, robotics, and intelligent algorithms, to achieve efficient and safe load transportation.

Overall, automatic or self driving load carrier projects play a vital role in modernizing material handling processes, improving operational efficiency, and optimizing logistics in various industries. Their implementation can lead to cost savings, increased productivity, and a safer working environment.

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