Development of Forklift Management System

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Abstract: With the continuous development of the scale of the enterprise, the type of warehouse management is increasing, the frequency of the forklift truck is increasing rapidly. The warehouse management operation is very complex and diversified. The traditional one relies on a non-automatic, based on paper file, and is completely managed by the internal forklift system in the warehouse. Because of its low efficiency of scheduling management, it has become more and more unable to meet the rapid and accurate requirements of today's large warehouse management, which seriously affects the operation efficiency of the enterprises, and has become a major obstacle to the development of enterprises.

1. Introduction

The information degree of the warehouse management in the Zibo textile factory is insufficient, and it is urgent to carry out the rectification of information. In the original warehouse management system, the search of the goods, the query and change of the inventory, the storage of the large single goods, and so on, are largely depended on the manual operation of the managers, and the scheduling of the forklift truck is difficult.[1] Coordination and communication costs are high, work efficiency is low, management and control capabilities are poor. For a large enterprise, the accuracy and efficiency of warehouse management is one of the keys to its normal development.

2. Workshop scheduling management device

A workshop forklift scheduling management device comprises a base 1, a reader and writer 2, a low frequency activation locator 11 and an electronic tag 3, the electronic tag 3 is fixed to the top of a forklift, the external power is electrically connected to the reader 2, the low frequency activation locator 11 and the electronic tag 3, the low frequency activation locator 11, the wireless connection electronic tag 3, the electronic tag 3. The wireless connection Reader 2, the reader and writer 2 wirelessly connects the external wall computer, the electronic tag 3 is a semi active RFID of the low frequency activated electronic tag (model: TY-T602A or TY-T603A), which has a unique code, each tag and the forklift initialization binding, which is normally dormant to signal to the outside world, only it is in the trigger. In the signal range, the signal is sent to the outside world by the low frequency activated locator 11 (model: TY-A201A). [2-4] The reader 2 is a RFID long distance reader (model: TY-R301A), which is used to collect the information sent after the activation of the low frequency activated electronic tag. After the reader 2 has collected the data, the information is uploaded to the electricity through various transmission modes. The center of brain management, the management center will analyze, handle, store and judge all kinds of data, so as to complete the function of the whole warehouse positioning and dispatching management system. The left side of the upper surface of the base 1 is set up with a slots 4, the bottom end of the lift slot 4 is rotated to connect the rotating rod 5, and the central fixed connection of the rotor 5 has the first lifting tube 6. The inner wall of the first lifting tube 6 is inserted into the second lifting tube 7, the inner wall of the second lifting tube 7 is inserted with the third lifting tube 8, the upper end of the inner wall of

the third lifting tube 8 is connected with the screw 10, the upper end of the screw 10 is fixed with the chassis 9, the left and right of the chamber of the chassis 9 are fixed with the low frequency activation locator 11 and the reader writer respectively.
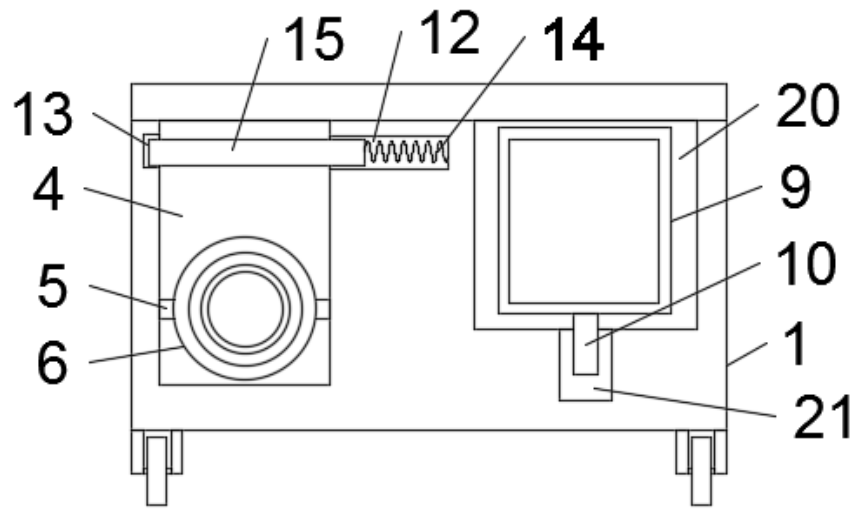

Fig.1 Workshop scheduling management device

3. System function

The implementation of the intelligent warehouse management system can improve the efficiency of storage management by changing the existing problems that can not be monitored, ununified management, forklift overspeed injury, management uncontrollable and so on.

(1) Task management

To achieve the forklift task submission, sending, receiving and feedback tracking information, and according to the task dispatch situation to determine the forklift status.

(2) Forklift supervision

The real-time monitoring of the status and position information of the forklift is displayed in the dispatching center, and the appropriate forklift truck is selected according to the position and demand of the business request, so as to realize the accurate and efficient scheduling, prevent the idle work and empty the empty car.[5]

(3) User management

Functional operation area (user operation) can know its function through main operation buttons and information content: adding users, editing users, deleting users, modifying ciphers, setting roles, individual authorization, organization mobilization, user effectiveness, user sort and so on.

(4) Log management

Log management can record all actions generated by the system and express it in accordance with certain specifications. The information recorded in the log system can be used to debug the system, optimize the performance of the system, or adjust the behavior of the system based on these information. Collecting the data you want and analyzing valuable information can improve the security of the system and products, and help develop and improve the code and optimize the products.

4. System implementation

The RFID antenna is installed on the forklift, the RFID track label on the ground is identified, the positioning and navigation of the forklift truck are realized through the interaction of the wireless network and the system, and the positioning information is transmitted to the forklift tablet computer by the visual image, and the forklift truck is guided.

4.1 Information analysis system

It is the core of the storage management system based on RFID technology. The function of the system is to analyze the information in the goods and pallet electronic tags, and generate various instructions to the forklift truck according to the plan.

1) Generation of warehouse instruction

First of all, the purchasing department needs to check the inventory status of the goods and set the purchase order according to the actual situation.

After the flow center receives the arrival information of the superior department, the storekeeper determines that after the quality is in good condition, fill in the warehouse list according to the relevant documents. [6] The information analysis system arranges the corresponding library position and generates the forklift instruction according to the warehouse receipt and the actual situation of the warehouse, and sends the forklift truck through the information forwarding storage system to operate the forklift truck. After the forklift operation is completed, the warehouse forklift staff will send the operation status to the server to update the working status of the forklift.

2) Generation of outgoing instructions

First, the business department issued a bill of goods, which should specify the items listed in the goods code, the name of the goods, the specifications and the origin of the goods. The information analysis system will generate the forklift finger according to the information of the actual position of the goods in the warehouse receipt, the warehouse and the location of the goods, and send it through the information forwarding storage system. The forklift is operated. After the forklift operation is completed, the operation status is sent to the server through the buried RFID reader at the outlet, and the forklift instructions are updated.

4.2 Information storage and forwarding system

The information storage and forwarding system is the hub station for forwarding and storing information between RFID system, fork truck RFID system, information analysis system, touch screen system and so on. [7] It realizes the transfer and sharing of information storage, such as operation plan, work schedule, information recognition and so on.

4.3 Touch screen system

It shows the type, brand and specification of the warehouse receipts, the number of warehouses in the operation area, and the state of the instructions.

Forklift truck number and location, outgoing warehouse final, outgoing, warehousing documents and other information.

4.4 Network system

The system adopts open and distributed architecture, and the main equipment of the system is redundant configuration. The system is equipped with multiple servers, workstations, routers, terminal servers, WEB servers, network management report workstations, scheduling management workstations, and GPS through LAN. The LAN adopts double Ethernet to improve the reliability of communication. The local area network provides high-speed data channels between the system nodes, and the coordination among the nodes of the system is realized through the system network software.

5. System advantages

The system uses RFID and other technologies to realize the fast, automatic and effective collection and recognition of the related material information in the storage management process. The data interaction is realized through the wireless network, and the level of storage management is improved.

(1) The visual display and operation of the forklift position, material location, material information and storage information are carried out by the vehicle with large screen, which can fully control the inventory, document status and task execution in the warehouse, and realize the

guidance of all aspects of the operation, through the shelves strategy, distribution strategy and replenishment strategy. And the overall optimization of the operation path effectively improves the efficiency and utilization ratio of the forklift.

(2) The use of open data platform and modular design plan, without changing the original hardware facilities and layout, according to the development needs of the enterprise, flexible adjustment of business process and organization structure, can effectively reduce the operation cost of the enterprise.

6. Conclusion

The RFID technology is used to identify the forklift, the goods and the silo. The information data of the goods are stored in the chip of the electronic label. The RFID system in the library can realize the automatic collection of the cargo information in the warehouse inspection, the library management and the out of the library.[8] The operation process of the warehouse manager is simplified, and the operation process of the warehouse manager is simplified. The operation efficiency reduces the labor cost. In short, the start-up of the new management system will bring great improvement to the whole workshop production scheduling management. These changes are not only reflected in the transformation of the mode of scheduling management, but also in the transformation of the idea of scheduling management. At the same time, the modernization and information level of the management are reflected. The quality of the staff will be improved with the improvement of the management mode, and the self-discipline and enthusiasm of the production work are greatly stimulated.

There are more than 2000 warehousing enterprises in China. Each family needs 1 sets of warehousing systems, about more than 2000 sets, each can save about 6 people, and the added value of the product is greatly improved. Both for enterprises and storage system R & D parties, there will be very considerable benefits and great social benefits to the society.

This project uses electronic, mechanical, Internet of things, automation and other disciplines. It is a comprehensive research and development project in multidisciplinary. It is very difficult and needs a lot of manpower and material resources to complete. However, this kind of equipment enterprise has great demand and the prospect of industrialization is very broad.

In this paper, an enterprise warehouse management as an example, the overall design of the warehouse management system, through the situation of enterprise operation, this system can effectively improve the speed of the goods out of storage and the accuracy of the goods out of the warehouse, making the operation more convenient and quick. At the same time, from the long distance, the operation of warehouse management can be saved. Ben.

Acknowledgement

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