Development of a synthetic library automation system

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Abstract: We developed the synthetic library automation system. Developed system is comprised of two main units: an auto sorting system of books and a wireless management system. An auto sorting system is composed of a book return machine, a robot system, and an emergency bookshelf. A book return machine is operated by magnetic removal-revival. A wireless management system is development of RFID, or radio frequency identification, and is composed of a RF module and uninhabited return machine and a loss prevention system. The software for the synthetic library automation system is divided into three groups. We realized the developed automation system, and then get the features.

Keywords: auto-sorting system, RFID system, synthetic library automation system, book return machine

1. INTRODUCTION

In the 21st century, libraries will operate with such service that customers will be able to check materials in and out themselves and find what they want almost instantly leaving library staff with more time to give customers the personal attention so many of them need and to keep up with the avalanche of new information and materials being created every day. Therefore automation system for libraries tries to get a better management, security, and service for customers, and recently a library is increased to construct the automation system using an auto lending machine, a loss prevention flag, and a book return machine for decreasing of labor power and time. But this conventional automation system using the barcode needs many time and labor power for receiving and delivering of book from a library, the present state and inventory arrangement of stocks, and sorting of returned books[1].

In order to resolve these problems, we will develop the synthetic library automation system. Developed system is comprised of two main units: an auto sorting system of books and wireless management system. An auto sorting system is composed of a book return machine, a robot system, and an emergency bookshelf. A book return machine is operated by magnetic removal-revival. A wireless management system is development of RFID, or radio frequency identification, and is composed of a RF module and uninhabited return machine and a loss prevention system. A RF module is the access point of wireless terminal, uninhabited return machine is combined the robot system. RFID system that uses the RF tag is able to control the lending and return of books by wireless and the return books are classified automatically by the robot system.

RFID is one of the most exciting new library technologies in years. It promises to revolutionize how librarians do their work and how customers receive library services. We will realize the developed automation system, and then will verify the effectiveness.

2. AUTO SORTING SYSTEM

An auto sorting system is composed of a book return machine, robot system, and an emergency bookshelf. A book return machine is operated by magnetic removal-revival. Turn number of coil of this machine is very important. Figure 1 shows a signal flow chart of an auto sorting[2].

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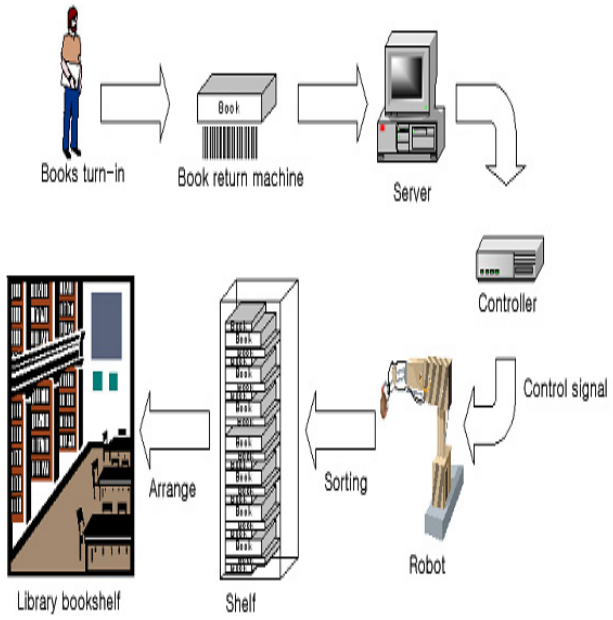

Fig. 1 A signal flow graph of an auto sorting system.

In figure 1, customer inserts a book, and then RFID tag will be read. This information sends the server, and then server does the return processing. A gripper of robot grips a book, and then put an emergency bookshelf.

2.1 Book return machine

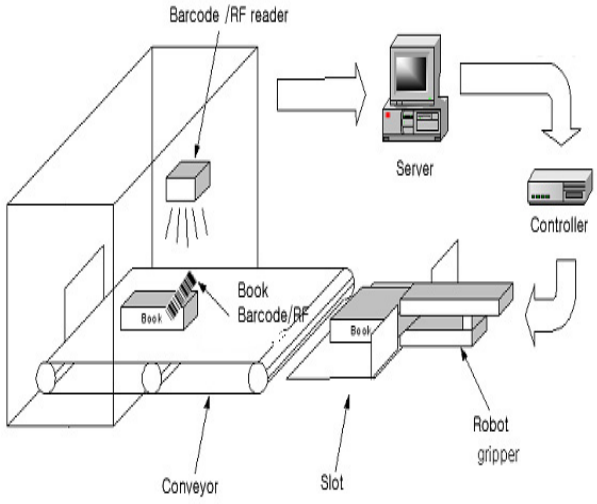

Fig. 2 Auto book return machine system.

2.2 Robot system

Figure 3 shows an equipment of auto arrangement system.

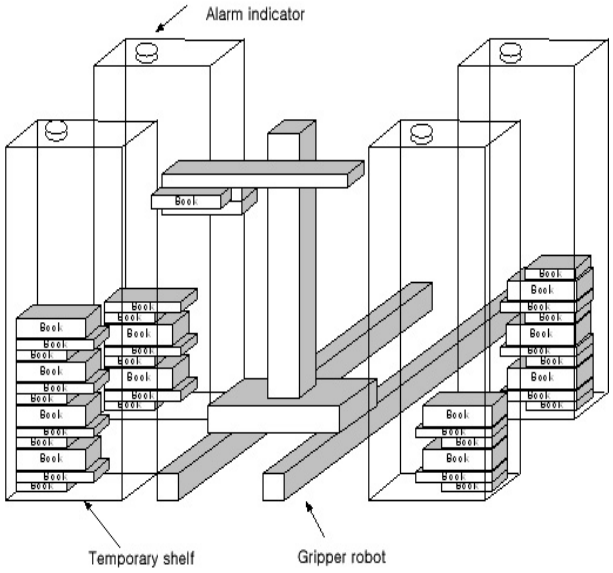

Fig. 3 Equipment of auto arrangement.

Figure 4 shows a composition of robot for auto arrangement.

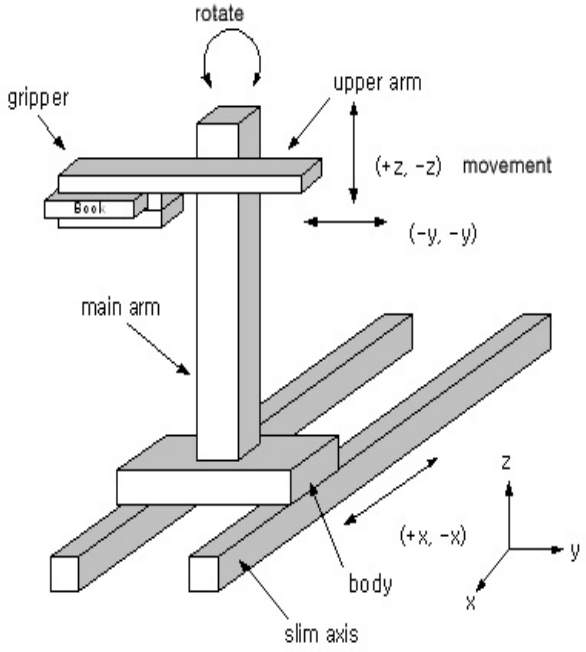

Fig. 4 Composition of robot for auto arrangement.

2.3 Emergency bookshelf

An emergency bookshelf is shown in Figure 5.

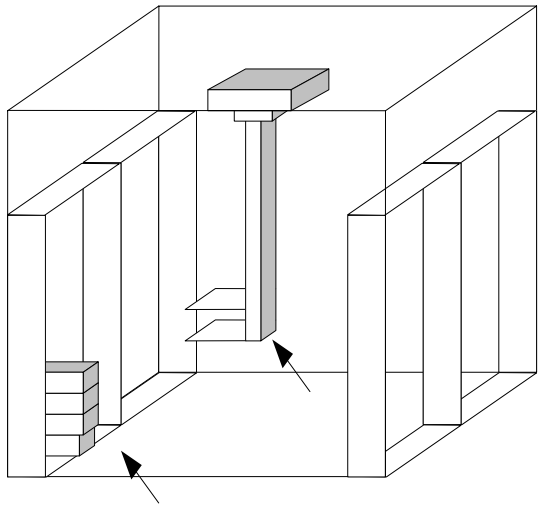

Fig. 5 Emergency bookshelf.

3. RFID SYSTEM

A wireless management system is development of RFID, or radio frequency identification, and is composed of a RF module and uninhabited return machine and a loss prevention system. A RF module is the access point of wireless terminal, uninhabited return machine is combined the robot system.

RFID system that uses the RF tag is able to control the lending and return of books by wireless and the return books are classified automatically by the robot system[2][3].

RFID is one of the most exciting new library technologies in years. It promises to revolutionize how librarians do their work and how customers receive library services. Figure 6 shows a blockdiagram of RFID book management system. We can continue using current bar code identification system. RFID systems can you to easily locate, inventory, and check in/out files. Line-of-sight physical scanning, as with barcodes, is no longer required. Figure 6 shows a book management system[4].

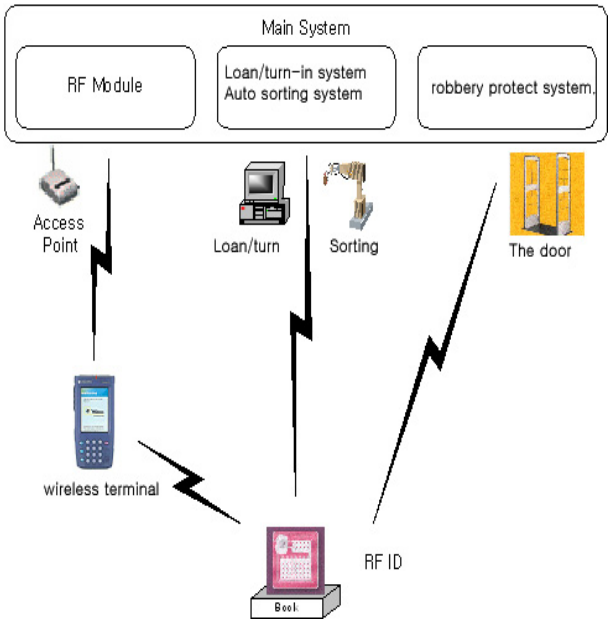

Fig.6 Book management system

4. SYNTHETIC LIBRARY AUTOMATION SYSTEM

Figure 7 shows a actual picture of synthetic library automation system. The software for the synthetic library automation system is divided into three groups. First is the overall system function. This software is used to detect the radio waves and read. Second is the component function. This software is used in each component of the system to communicate either with the connected server. Third is the library circulation software. This software has to perform the circulation function[5][6].

Fig. 7 synthetic library automation system

5. Conclusion

Conventional automation system using the barcode needs many time and labor power for receiving and delivering of book from a library, the present state and inventory arrangement of stocks, and sorting of returned books.

In order to resolve these problems, we developed the synthetic library automation system. Developed system is comprised of two main units: an auto sorting system of books and wireless management system.

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The software for the synthetic library automation system is divided into three groups.

1. Software for the overall system fuction.
2. Software for the component function.

3. Library circulation software.

We realized the developed automation system, and then get the following features.

- This system boosts library's efficiency and library staff's productivity at the same time as it improves services to customers.
- Release staff from some of the most tedious and repetitive tasks.
- This system provides better services, a friendlier, and more rewarding library experience.
- This system reduces time and labor power to take an inventory from days to hours.

ACKNOWLEDGEMENTS

This research has been carried out with Buery system, Inc.

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