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LOW COST PARCEL SORTING SYSTEM WITH BCR: AN AUTOMATED APPROACH

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Abstract: This paper demonstrates the functional elements of an automated sorting system by using a bar code reader (BCR). The adaptability of Bar Code Reader (BCR) is destined for the recognition of the destination code through the bar code available in the parcel and sorting them accordingly. A parcel usually comes with a consignment number with a set of bar code representing them. The destination code must also be included in the bar code set, so as to enable the recognition of the destination by the bar code reader. The process of sorting can be continued by using a timed rolling system which will be in the conveyer belt as a cross member which will drop down the parcel to the destination box. There must be separate sorting system for incoming and outgoing parcels to avoid complications.

Keywords: Parcel; BCR; conveyer belt; roller; automated.

I. Introduction

In today's advancing world everything is tried to be automated. An automated parcel sorter system is a type of system in which the sorting of a parcel is done on different basis as per the requirement of the user. There are many types of parcel sorting system used now-a-days, but it is either too costly or is complicated in its use. Generally while categorization of parcel there is a lot of confusion and this results in misplacing of parcel which causes a serious loss to the customer. In order to attain a smooth categorization of parcel, a sorter is an appropriate choice. Basically a sorter system enhances the quality of parcel sorting in minimized time and also reduces the extra human labour required for identifying and sorting the parcels. Because of the automated approach the time of sorting is reduced to a great extent. The components of the system has been described below-

A. Barcode Reader (BCR)

BCR or Barcode Reader is a electronic recognition device used to recognize the code which are symbolized by using bars of different thickness giving different values. It consists of a light source, a lens and a light sensor which translates the optical signal to electrical signal.

In this system a BCR is used to recognize the destination code along with the consignment number to help the computer system to identify the box in which the parcel must be placed.

B. Conveyor Belt

Conveyor belt is a type of belt used to transfer objects to different destinations along its length. It consists of two or more pulleys with a continuous loop that rotates about them. One or more of the pulleys can be powered.

In this system conveyor belt is being used to follow a linear path throughout the length of the conveyor belt.

C. Computer System and Control Box

Computer system is that system which takes the data from the barcode reader and processes it accordingly and sends the desired information to the control box.

Control box controls the operation of the rollers. After getting the information from the computer system it directs that which roller must rotate in which direction.

D. Rollers

Rollers are placed in between the conveyor belt as a cross member. Its main purpose is to guide the parcel to go to the destination box by rotating either in clockwise direction or anticlockwise direction.

E. Destination Box

These are the boxes placed by the side of the rollers to receive the parcel rolled by the rollers. One of the destination boxes is also kept at the end of the conveyor belt to receive the parcels which are unidentified for other boxes.

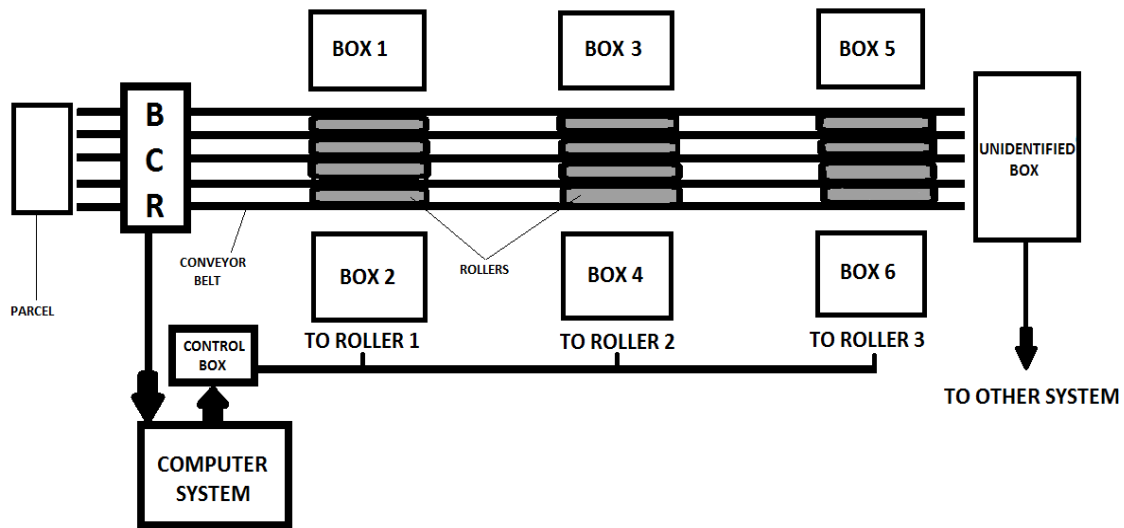


Fig.1. Generalized Diagram for Incoming and Outgoing Parcel

II. Description

The parcels from distinct places are received and they required to be distributed to different places. There are two cases for distribution: -

1. Incoming parcel
 2. Outgoing parcel
- Incoming parcels can be for same region or other regions. For example in Chhattisgarh centralized place for distribution in Raipur. In Raipur, parcels are needed to be distributed on the same region or in the other region (i.e. Delhi, Mumbai, Kolkata etc).
 - Outgoing parcels are those parcel which are booked at the same centre and needed to be distributed on the same region or the other region.

After the receiving of the parcels they are placed in the conveyer belt. Bar code reader will read the destination code and give instruction to the computer system about the destination address. Computer system will forward this destination address to control box. Control box will decide to which location it will go according to the satisfied condition.

- If the satisfied condition is met, instruction is given to the roller for its movement in clockwise or anticlockwise direction.
- According to the box number control box will decide in which direction roller will rotate (clockwise or anticlockwise direction). If the box number is odd then roller will move in anticlockwise direction else move in clockwise direction to put the parcels in the boxes.

- If the condition is not satisfied then parcel will go to the unidentified box, from that box it will go to the other system where the same process will occur. When the parcel are not recognized by the bar code reader than it will go to the unidentified box from where it will be transferred to the other system, the other system for incoming is outgoing system and vice versa.

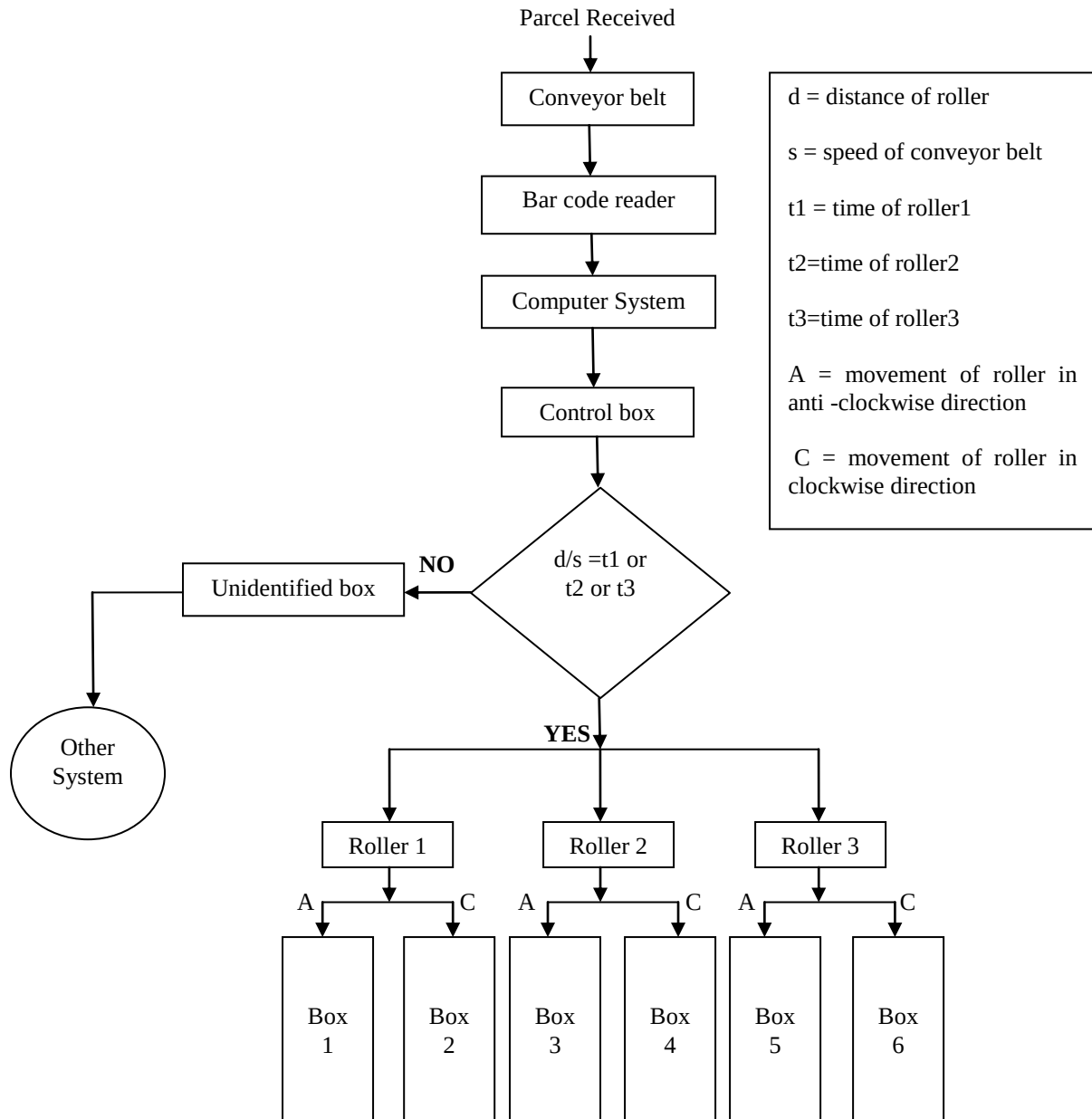


Fig.2. flow diagram of working of BCR parcel sorting system

III. Discussion

The basic aim of a sorter system is to distinguish between the parcel destinations. The design presented in the paper is a type of low budget automated system compared to other sorter systems that are being used now-a-days. Implementation of such system can definitely work for low as well as high intake project segments of parcel delivery organizations.

The sorters that are available require high costing equipments which restrict the use of such sorting systems to big organizations only. A simplified model of a sorter system with less complications and cost is described in the paper. This type of sorter system model can be implemented to all type of organizations whether it is small or big.

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