

DESIGN AND DEVELOPMENT OF AUTOMATIC SORTING MACHINE

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Abstract : This paper shows the functional elements of an automated sorting system by using a RFID reader in which parcel is sorted according destination(region wise).We are making a machine in which the RFID Reader read the RFID tag attached on the parcel and recognize the destination code through the RFID tag and sort them accordingly. The destination code is included in the RFID Tag so that the RFID reader recognize the destination. The process of sorting can be continued by using a timed rolling system in which the parcel move over conveyer belt and time is adjusted to move the sorting arm when the parcel come in front of sorting arm.

Index Terms – Introduction, Component, Working, 3D design, Experimental setup, Conclusion

I. INTRODUCTION

In today's world everything is tried to be automated. The traditional approach of sorting is tedious time consuming slow and non consistent process. There are many types of parcel sorting system used now-a-days, but it is either too costly or is complicated in its use. we are making cost effective machine which can do accurate sorting with less time as compared to manual sorting. Sorting 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.

II. COMPONENT

2.1 PNEUMATIC CYLINDER

Pneumatic Cylinder are mechanical device which uses pressurized gas to transmit and control power. Pneumatic systems typically use air as the fluid medium because air is safe, free and readily available. specification of pneumatic cylinder bore diameter is 25mm and stroke length is 200mm.



2.2 COMPRESSOR

compressor is used to transfer the compressed air to the pneumatic cylinder. specification 12v dc ,P=150psi, Q=35 L/MIN.



2.3 SOLENOIDAL VALVE

we are using a 3/2 solenoidal valve. Solenoidal valve guide the compressed air to pneumatic cylinder.



2.4 DC MOTOR

DC Motor is used to rotate the roller on which the conveyor belt rolls. Specification 12v DC 5amp.

2.5 CONVEYOR BELT

the material used is for conveyor belt PVC.

2.6 RFID

A radio frequency identification reader (RFID reader) is a device used to gather information from an RFID tag, which is used to track individual objects. Radio waves are used to transfer data from the tag to a reader. Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically-stored



information.

2.7 ARDUINO CIRCUIT

Arduino consist of both a physical programmable circuit board (micro controller) and a piece of software that run on computer used to write and upload computer code to the arduino board.

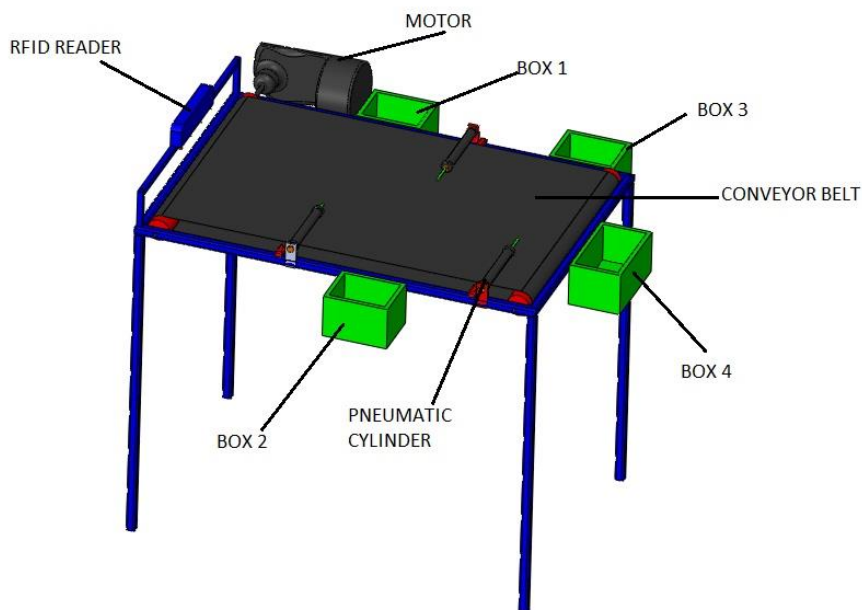


III. WORKING

In this our automatic box sorting system the box of different regions for eg (rajasthan, Haryana, punjab) is coming to the conveyor belt. when parcel coming, first RFID reader reads the RFID TAG attached on to the box (parcel) then it sends signal to arduino circuit board which is input to the arduino circuit, then arduino circuit (microcontroller) decides that which pneumatic cylinder (sorting arm) has to move and after how much time it has to move (according to the coding which is done by computer system and this coding file attached to the usb port of the arduino board). For example suppose consider the case of box of Haryana. If we want to sort the box of Haryana to the 2nd destination then first of all we decide that after how much time it will reach in front of 2nd pneumatic arm, and according to time required by the box to reach at particular destination (2nd) we will set

the coding for aurdino board and after the particular interval of time(that required by the box to reach the destination) it will actuates the arm and box will sort(for example box of Haryana takes 4 sec time to reach 2nd destination then after exact 4 sec it will sort the box) same thing will work for destination 1 and 3(punjab & rajasthan).

IV. 3D DESIGN



V. EXPERIMENTAL SETUP



VI. CONCLUSION

This paper represent automatic sorting machine which can do sorting of parcel basis on the destination code(region) automatically with the help of RFID reader by reading the RFID Tag attached on the parcel.

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