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INDUSTRIAL OBJECT SEPARATION USING WEIGHT, COLOR, AND BARCODE MODE WITH GSM NOTIFICATION AND MATERIAL HANDLING

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Abstract - *Sorting of products in an industry is a tedious industrial process, which is generally carried out manually. Continuous manual sorting creates quality consistency issues. Separation based on different modes like weight, colour, barcode type require for separation of objects. We have proposed an efficient method which uses load cell, barcode sensor , colour sensor for identifying and segregating on the basis of weight, colour and barcode of object and PLC is used to control the overall process of sorting different types of objects. A pusher and trolley arrangement is used to collect objects of different colours, weight and barcode type. Conveyor belt is used, which is controlled by AC servo-sink motor. Object is placed on the belt on which its weight, colour and barcode is sensed simultaneously. Pusher is used which will push the object into the trolley. The pusher is controlled by DC motor. Once the product is kept on the conveyor belt it will be sensed by any of the three sensor and according to decided trolley it will push the object in that particular trolley. HMI screen is used to acknowledge the trolley, and the number of objects separated will also be displayed on this screen. Here GSM notification system is also used which will notify different parameters like number of objects on our mobile phone.*

Keywords **– Conveyor Line, DC Motor, AC motor, barcode sensor, load cell, Color Sensor, Pushers, GSM system, PLC and HMI.**

1. INTRODUCTION

Sorting of products is a very difficult in industrial process. The Continuous manual sorting creates consistency issues. The main purpose of this project is to design and implement a system which automatically separates products based on their weight, color and barcode. This system reduces the efforts of man power on whole. This system reduces the labor work as well as increase the production. The system is reliable and highly efficient.

1.1 Functional Principle

Object placed on conveyor belt will be sensed. In automatic mode, weight or colour or barcode will be sensed and according to the decided trolley the pusher device will push the object in particular trolley. Trolley will move down and objects will be unloaded from it and then again trolley will move up at its position. GSM notification will notify the user about the objects collected and will display on HMI. In test mode, we can manually operate all the devices and can check the operation. When separation is done through weight, load cell is used to weight the object and accordingly voltages are generated and are sent to PLC. When separation is done through colour, colour sensor comes into picture and sense the colour of the object and accordingly object is separated. Barcode is used in both weight and colour mode. Barcode scanner is used to scan the barcode and it displays it on HMI

1.2 Objectives

Purpose of PLC:- Programmable Logic Controller is used for making the whole system automatic. Industrial automation is done through PLC. Earlier object separation was carried out manually but in our system we are making the separation automatic.

The main objective of this system is to segregate various kinds of industrial objects that come in cluster in any packing industry. This separation is done on basis of weight, colour and barcode of the object. There are three sensor used viz. Load cell for determining weight, Colour sensor for detecting colour of object, and Barcode sensor for detecting the barcode of the object. Out of three modes any one mode can be selected at a time for operation. Trolley and pusher arrangement is used to separate the objects.

2. BLOCK DIAGRAM

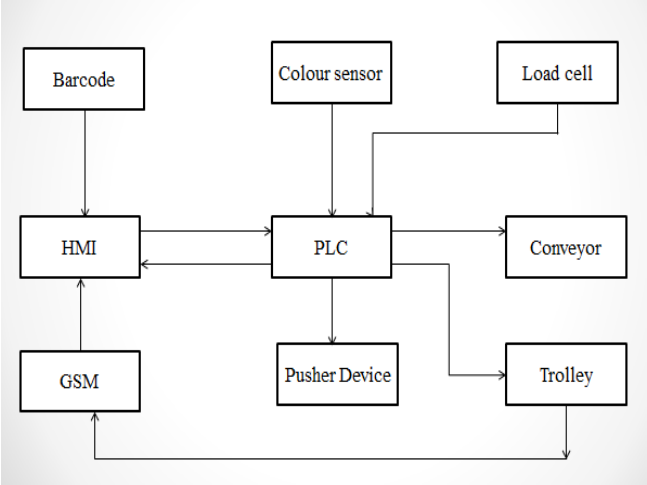

Fig. Shows the block diagram for the industrial object separation system.

PLC is the heart of the whole system. There are three modes of operation viz. weight mode, colour mode, and barcode mode. As the object is placed on the conveyor belt it is sensed by the object sensor. Now suppose if weight mode is selected then load cell will weigh the object and it will give signal to PLC. According to PLC Programming low weight object will be separated in one trolley and high weight object into another trolley.

HMI (Human Machine Interface) screen is used to interface with the system. The whole system can be controlled from the HMI screen.

GSM system is also implemented in our system. It will notify the user about the number of objects separated.

3. LAYOUT

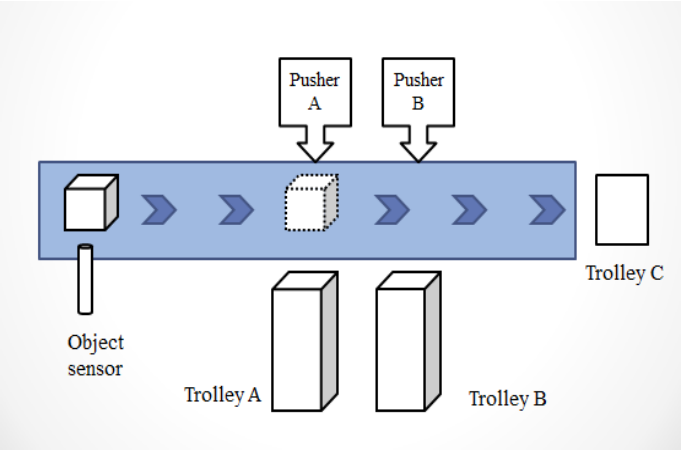

Fig. shows the layout of the object separation system

4. CONCLUSION

Thus with the help of this system, industrial object separation is done using weight, color, and barcode of the object. This system reduces human error and reduces man power. According to this concept, separation of industrial object is done easily with high efficiency and good accuracy.

REFERENCES

1. Automatic Box Sorting Machine IJSRD - International Journal for Scientific Research & Development| Vol. 4, Issue 04,2016 ISSN(online):2321-0613. Shreeya V. Kulkarni, Swati R. Bhosale.

2. Sorting of Objects Based on Colour, Weight and Type on A Conveyor Line Using PLC -ISSN: 2278-1684,p-ISSN: 2320-334X, S. V. Rautu.

3. Prof.Nilima Bargal, Aditya Deshpande, Rucha Kulkarni, Rucha Moghe, PLC based Object Sorting Automation, International Research Journal Of Engineering & Technology, ISSN (Online): 2395-0056, July 2016.

4. Dharmannagari Vinay Kumar Reddy, Sorting Of Objects Based On Colour By Pick And Place Robotic Arm And With Conveyor Belt Arrangement, International Journal Of Mechanical And Robotics Research, ISSN 2278 – 0149, January 2014.