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NEED OF AUTOMATION IN OBJECT SORTING

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Abstract: In today's world of technology and due to speed running industries, the production rate has increased tremendously. Generally, manufacturing industries keep manufacturing same models with little variation in height, colour, weight, shape. And here sorting plays an important role. In such cases industries can't bare human errors for sorting these products. Thus it become necessary to develop Low Cost Automation (LCA) for sorting these products in accurate manner. Industrial automation mainly focuses on developing automations having low cost, low maintenance, long durability and to make systems user friendly as possible. Finally, here we have developed a LCA system for sorting the light objects on the basis of size variation using DC geared motors which is controlled by Programmable Logic Controller (PLC) and the conveyor in the system passes the object in front of sensors and thus sorting logic is decided.

Index Terms - PLC, Low cost automation, Conveyor belt, Sorting, Object, Human, Sensor, Drive, Motor.

I. INTRODUCTION

Motive of this project is to create the electronic material handling system which can be used to deduct the efforts of workers and to reduce the time spent in inspection of the components, during their manufacturing. It also deduct the efforts in transferring the components manufactured to another works place . The most appropriate reasons in installing of automatic system in industry are,

- i. Saving Man Power.
- ii. Improved Quality and Efficiency.
- iii. Increase consistency and Flexibility.

This automatic sorting machine has real tasks of sorting components according to their sizes. This automatic sorting machine also consists of conveyor belt, which deduct the efforts of material handling. Also both processes work side by side like material handling and inspection.

II. CONSTRUCTION DETAILS

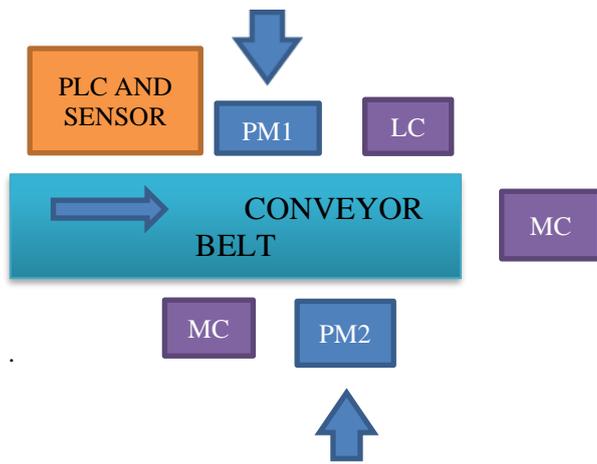
Using sensors, conveyor belts, programmable logic controllers (PLCs), and sorting mechanisms, multilevel object sorting with PLC typically sorts objects according to specified criteria. The building details involved in multilevel object sorting using PLC are briefly summarised as follows:

Conveyor Belt System: The sorting process is supported by a conveyor belt system. It has a network of belts that move things from one place to another. The materials used to make the belts are strong enough to support the weight of the objects and the frequent movement. To guarantee that things are carried at a constant speed, the conveyor belt's speed can be managed by PLCs.

Sensors are used to determine whether things are present on the transporter belt. They can identify any aspect of the object that is necessary for sorting, including size, shape, colour, and more. To guarantee that things are sorted accurately, sensors can be positioned at various positions along the conveyor belt.

PLCs, also known as programmable logic controllers, are the sorting system's brains. They use pre-programmed logic to manage the sorting mechanism after receiving information from sensors. The PLCs can be set up to classify items according to their size, shape, weight, colour, or any other criterion that needs to be taken into account.

III. BLOCK DAIGRAM



IV. RESULT

The operation of the system has been done and got the sorting results as follows.

1. When sensor I is activated then cylinder I is operated which pushes the object away from the conveyor belt.
2. When sensor II is activated then cylinder II is operated which push the object away from conveyor belt

V. CONCLUSIONS

The study and improvement of PLC Controlled Multilevel Object Sorting System has been successfully performed. Thus the completion of project work take to a better results and let us to study the PLC system and also the various parts of the hardware used. This system can be completely used in industries.

VI. FUTURE DEVELOPMENTS

Below developments can be done in the system to increase the production rate and to minimize various cost.

1. Using high quality sensor we can increase the speed of the process.
2. Objects sorted can be eminent easily by improving extra circuit . It is also economical.
3. This system can be used to sort one or more than one object in one cycle by suitably changing the hardware and software of the system.

Also we can use such systems with some more modifications for various different types of inspection such as

1. The Inspection Parameter
2. Diameter, hole and diameter
3. Height
4. Thickness
5. Surface defect
6. Crack, burr
7. Roundness
8. Minor and major diameter
9. Chamfer angle etc.

REFERENCES

- [1] Automatic Sorting at Process Industries using PLC by P. Thirumurugan , R. Aravind , M. Arun Kumar, S. Manjunath R. Kalaiselvan GRD Journals- Global Research and Development Journal for Engineering | Volume 3 | Issue 3 | February
- [2] Conveyor loading control system & object sorting by using PLC by Diksha Deote, Varsha Sirsat and Swarali Khule (April 2017) International Journal For Technological Research In Engineering Volume 4, Issue 8.
- [3] Automatic sorting machine by Prof. V.W. Patil, Gaikwad Sachin, Babar Nikhil, Shevante Pramod, Gaikwad Ganesh (June 2017) Vol-3 Issue- 3.
- [4] Automatic detection and sorting of material by Akshay varpe, snehal Marne, manasi more, dr. Manish jadhav (2017) international journal of innovations in engineering research and technology. Proceedings of TECHNO-2K17 (Technical Symposium).
- [5] PLC Based on Object Sorting and Low Cost Automation by Prof. Nilima Bargal, Aditya Deshpande, Ruchita Kulkarni, Rucha Mothghe. International Research Journal of Engineering and Technology (IRJET) Volume: 03 Issue: 07 | July-2016.