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CONVYOR BELT FOR WATER BOTTLE

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ABSTRACT

The AutomaticConveyor Belt Systemisdesigned asthe next stage of the Bottle Labeling Machine to transport bottlessmoothly and efficiently between different processing unitssuch asfilling, capping, and labeling stations.The systemisdeveloped using an Arduino Nano asthe main control unit.A DC gear motor isused to drive the conveyor belt, ensuring steady and controlled movement of bottles.An E18-D80 proximity sensor isused to detect the presence of bottleson the conveyor.A 16×2I2C LCD display is integrated to show systemstatusand bottle count in real-time.The conveyor speed can be controlled through motor driving circuitry, ensuring proper synchronization with labeling and filling units.

1. INTRODUCTION

In industrial automation, conveyor belt systemsplay a vital role in material handling and product transportation.In a Bottle Labeling Machine setup, the conveyor belt isresponsible for moving bottlesfromone processing station to another in a synchronized and controlled manner.\

2. LITERATUREREVIEW

Automation in manufacturing industrieshassignificantly increased due to the need for higher production rates, reduced labor costs, and improved product quality.Conveyor belt systemsformthe backbone of automated production lines, especially in industriessuch asbeverage, pharmaceutical, food processing, and packaging.

Below isa review of relevant studiesand developmentsrelated to convey or belt automation systems.

3. PLC-Based Conveyor Belt Automation Systems

Several researchershave developed conveyor belt systemscontrolled by Programmable LogicControllers(PLC) for industrial material handling.In these systems:

- Conveyor beltsare used to transport bottlesor products between different stations.

- Proximity sensorsand photoelectricsensorsdetect object presence.
- PLC controlsmotor speed, start-stop operations, and synchronization with filling or labeling units.
- Human Machine Interface (HMI) isused for monitoring and control.

4. SYSTEM DESIGNAND METHODOLOGY

When power issupplied, the Arduino Nano initializesall components including sensor, LCD, and motor driver.The LCD displayssystemready message.When the start button ispressed, the DC gear motor rotatesand drivesthe conveyor belt.Bottlesplaced on the conveyor move forward toward the next processing station. Upon detection, Arduino stopsthe conveyor motor to allow further operation such aslabeling or filling.The IRproximity sensor detectsthe bottle when it reachesa predefined position. After processing, Arduino restartsthe motor and the next bottle moves forward.The systemcontinuesthiscycle automatically for smooth bottle transportation

5. RESULT AND DISCUSSION

Recent developmentsin LEDspermit themto be used in environmental and task lighting.LEDshave many advantagesover incandescent light sources including lower energy consumption, longer lifetime, improved physical robustness, smaller size, and faster switching.Light-emitting diodesare now used in applicationsasdiverse asaviation lighting, automotive headlamps, advertising, general lighting, trafficsignals, and camera flashes.However, LEDspowerful enough for roomlighting are still relatively expensive, and require more precise current and heat management than compact fluorescent lamp sourcesof comparable output.

6. APPLICATINS

- Bottle labeling machine systems
- Bottle filling plants
- Pharmaceutical packaging
- Beverage industry
- Cosmeticindustry
- Food processing industries

7. CONCLUSION

The AutomaticConveyor Belt Systemdeveloped in thisproject successfully demonstratesan efficient and cost-effective solution for bottle transportation in an automated production line.The systemusesan

Arduino Nano asthe main controller to manage conveyor movement and synchronize bottle flow between processing unitssuch asfilling and labeling stations.

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