PROJECT 6

Understanding Conveyor assembly used in Industries

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Overview

Conveyor assemblies are critical components in industries, enabling the efficient and automated movement of materials and products. These systems streamline production processes, reduce labour costs, and enhance workplace safety. Commonly used in manufacturing, warehousing, and logistics, conveyors can be tailored to meet specific operational requirements.

Components of a Conveyor Assembly

1. Conveyor Belt

- A continuous belt made of rubber, plastic, or metal.
- Function: Carries materials from one point to another.

2. Rollers

- Cylindrical components supporting the belt.
- Types: Drive rollers (powered) and idler rollers (non-powered).

3. Motor and Drive System

- Powers the movement of the conveyor belt.
- Types: Gear motors, electric motors, or hydraulic systems.

4. Frame

- Structural base that holds the conveyor in place.
- Materials: Steel, aluminum, or composite materials.

5. Control System

- Includes sensors, switches, and controllers to regulate the conveyor's operation.
- Ensures smooth and safe functioning.

6. Pulleys

- Located at either end of the conveyor.
- Drive pulleys provide motion, while tail pulleys guide the belt.

Types of Conveyor Systems

1. Belt Conveyor

- Used for general-purpose transportation of materials.
- Common in food processing and manufacturing.

2. Roller Conveyor

- Utilizes rollers for moving goods.

- Ideal for heavy loads.

3. Chain Conveyor

- Uses chains to move products.
- Suitable for high-temperature environments.

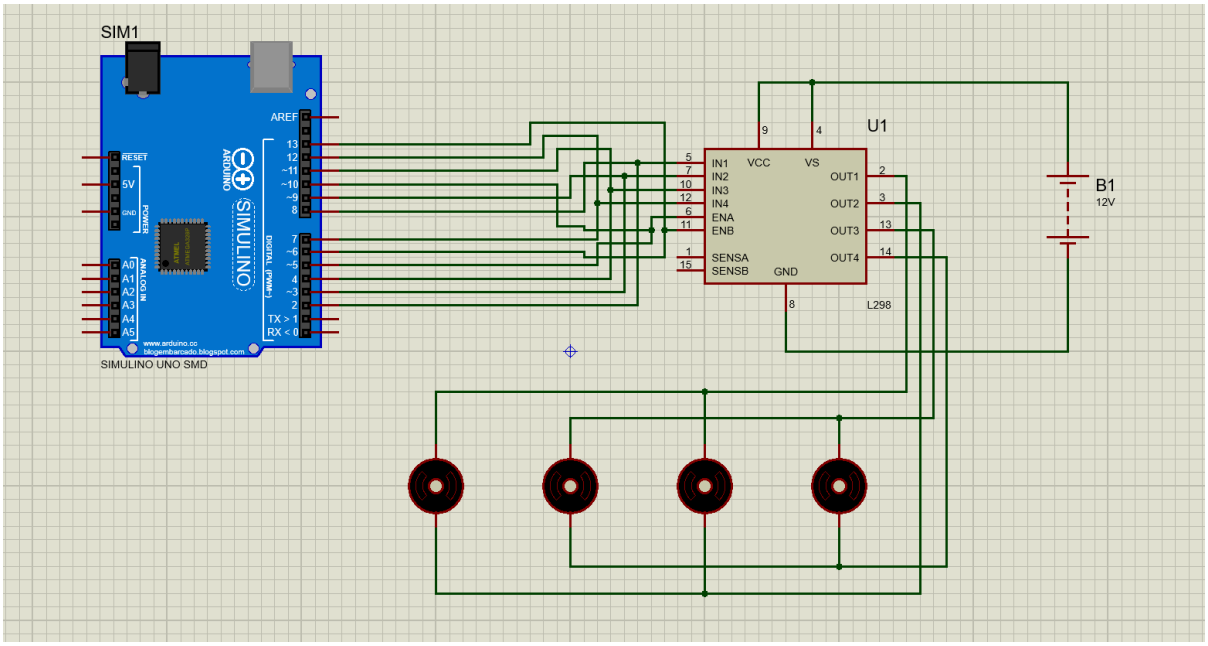
OBJECTIVE

To create a functional prototype of a conveyor assembly for demonstration and educational purposes.

COMPONENTS USED

- Arduino UNO R3
- Battery (DC Source)
- L298N motor driver
- 4 DC motors

SCHEMATIC DIAGRAM



PROGRAM

```
//Motor 1 pins
const int motor1Pin1 = 2;
const int motor1Pin2 = 3;
const int motor1PWM = 5;

// Motor 2 pins
const int motor2Pin1 = 4;
const int motor2Pin2 = 7;
const int motor2PWM = 6;

// Motor 3 pins
const int motor3Pin1 = 8;
const int motor3Pin2 = 9;
const int motor3PWM = 10;

// Motor 4 pins
const int motor4Pin1 = 11;
const int motor4Pin2 = 12;
const int motor4PWM = 13;

void setup() {
  // Set motor control pins as outputs
  pinMode(motor1Pin1, OUTPUT);
  pinMode(motor1Pin2, OUTPUT);
  pinMode(motor1PWM, OUTPUT);

  pinMode(motor2Pin1, OUTPUT);
  pinMode(motor2Pin2, OUTPUT);
  pinMode(motor2PWM, OUTPUT);

  pinMode(motor3Pin1, OUTPUT);
  pinMode(motor3Pin2, OUTPUT);
  pinMode(motor3PWM, OUTPUT);
```

```

  pinMode(motor4Pin1, OUTPUT);
  pinMode(motor4Pin2, OUTPUT);
  pinMode(motor4PWM, OUTPUT);

  // Initialize all motors in the same direction
  digitalWrite(motor1Pin1, HIGH);
  digitalWrite(motor1Pin2, LOW);
  digitalWrite(motor2Pin1, HIGH);
  digitalWrite(motor2Pin2, LOW);
  digitalWrite(motor3Pin1, HIGH);
  digitalWrite(motor3Pin2, LOW);
  digitalWrite(motor4Pin1, HIGH);
  digitalWrite(motor4Pin2, LOW);
}

void loop() {
  // Set all motors to full speed
  analogWrite(motor1PWM, 25);
  analogWrite(motor2PWM, 25);
  analogWrite(motor3PWM, 25);
  analogWrite(motor4PWM, 25);

}
```

APPLICATIONS OF THE PROTOTYPE

1. **Educational Demonstrations:**
    - Explaining automation in industries.
2. **Small-scale Material Handling:**
    - Lightweight objects in workshops.
3. **Robotics Integration:**
    - Use in projects requiring object transportation.
