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/* Ventilator Arduino Sketch
 * Dan Folmer - Northstar Load Cell and Scale
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 *
 * The sketch is designed to control solenoid flow valves to create
 * a medical ventilator to assist a patient with breathing.
 *
 * The design criteria of the ventilator are:
 * 1. Provide true breathing assistance, meaning pressure to
 * facilitate inhalation, and a vacuum to facilitate exhalation.
 * 2. Built from components that are easily sourced and within
 * the capability of fabricators to build themselves.
 * 3. Expandable so that one machine can care for multiple
 * patients.
 */
int solInhalePin = 3; // Pin signal controls the solenoid to pressurize the mask.
int solExhalePin = 4; // Pin signal controls the solenoid to open the mask to allow
air out or seal it shut.
int solVacPumpPin = 5; // Pin signal controls the air to the venturi vacuum pump.
int delayTime = 0; // The breath cycle rate. Changed by the trim pot input.
int trimPotPin = A0; // Pin signal of the trim pot.
int trimPotPinValue = 0;

void setup() {
  // Declare the digital pins as OUTPUT type.
  pinMode(solInhalePin, OUTPUT);
  pinMode(solExhalePin, OUTPUT);
  pinMode(solVacPumpPin, OUTPUT);
}

void loop() {
  // Cycle the solenoid pin outputs to control airflow in
  // and out of the mask.
  digitalWrite(solInhalePin, HIGH);
  digitalWrite(solExhalePin, LOW);
  digitalWrite(solVacPumpPin, LOW);
  delay(delayTime);
  digitalWrite(solInhalePin, LOW);
  digitalWrite(solExhalePin, HIGH);
  digitalWrite(solVacPumpPin, HIGH);
  delay(delayTime);

  // Convert the trim pot signal from the default analog values to milliseconds.
  trimPotPinValue = analogRead(trimPotPin);
  delayTime = map(trimPotPinValue, 0, 1023, 1000, 5000);
}

```