/\* Arduino Project - Pat's M&M Colour Sorting Machine

\* Modified by Pat McMahon 20/6/2020

\* A030

\* by Dejan Nedelkovski, www.HowToMechatronics.com

\* and No 26 Adeept Stepper Motor

\*/

#include <Servo.h>

#define S0 2

#define S1 3

#define S2 4

#define S3 5

#define sensorOut 6

int Pin0 = 8;//definition digital 8 pins as pin to control the Stepper Motor IN1 (ULN24L01)

int Pin1 = 9;//definition digital 9 pins as pin to control the Stepper Motor IN2 (ULN24L01)

int Pin2 = 10;//definition digital 10 pins as pin to control the Stepper Motor IN3 (ULN24L01)

int Pin3 = 11;//definition digital 11 pins as pin to control the Stepper Motor IN4 (ULN24L01)

int \_step = 512;

int \_speed = 1;

Servo bottomServo;

int frequency = 0;

int color=0;

void setup() {

pinMode(S0, OUTPUT);

pinMode(S1, OUTPUT);

pinMode(S2, OUTPUT);

pinMode(S3, OUTPUT);

pinMode(sensorOut, INPUT);

// Setting frequency-scaling to 20%

digitalWrite(S0, HIGH);

digitalWrite(S1, LOW);

pinMode(Pin0, OUTPUT);//Set digital 8 port mode, the OUTPUT for the output of the Stepper Motor

pinMode(Pin1, OUTPUT);//Set digital 9 port mode, the OUTPUT for the output of the Stepper Motor

pinMode(Pin2, OUTPUT);//Set digital 10 port mode, the OUTPUT for the output of the Stepper Motor

pinMode(Pin3, OUTPUT);//Set digital 11 port mode, the OUTPUT for the output of the Stepper Motor

//pinMode(bottomServo, OUTPUT);//Set digital 5 port mode, the OUTPUT for the output of the Servo Motor

}

//bottomServo.attach(5);

//Serial.begin(9600);

void loop() {

Speed(15);//Stepper motor speed = 15 fast (note:speed from 1 to 15)

Step(64);//Stepper motor forward 512/8=64 steps ---- 45 angle

delay(2000);// delay 2S

Speed(1); //Stepper motor speed = 1 slow (note:speed from 1 to 15)

delay(2000);//delay 2S

}

void Speed(int stepperspeed)//set Stepper speed

{

\_speed = 15 - stepperspeed;

if( \_speed<1){

\_speed = 1;

}

if( \_speed>15){

\_speed = 15;

}

}

void setStep(int a, int b, int c, int d)

{

digitalWrite(Pin0, a);

digitalWrite(Pin1, b);

digitalWrite(Pin2, c);

digitalWrite(Pin3, d);

}

void Step(int \_step)//Stepper motor rotation

{

if(\_step>=0){ // Stepper motor forward

for(int i=0;i<\_step;i++){

delay(\_speed);

setStep(1, 0, 0, 1);

delay(\_speed);

setStep(1, 0, 0, 0);

delay(\_speed);

setStep(1, 1, 0, 0);

delay(\_speed);

setStep(0, 1, 0, 0);

delay(\_speed);

setStep(0, 1, 1, 0);

delay(\_speed);

setStep(0, 0, 1, 0);

delay(\_speed);

setStep(0, 0, 1, 1);

delay(\_speed);

setStep(0, 0, 0, 1);

delay(\_speed);

}

//}

delay(500);

//int readColor();

delay(10);

switch (color) {

case 1:

bottomServo.write(0);

break;

case 2:

bottomServo.write(29);

break;

case 3:

bottomServo.write(45);

break;

case 4:

bottomServo.write(63);

break;

case 5:

bottomServo.write(83);

break;

case 6:

bottomServo.write(100);

break;

case 0:

break;

}

delay(300);

int readColor();

color=0;

}

// Custom Function - readColor()

int readColor();

// Setting red filtered photodiodes to be read

digitalWrite(S2, LOW);

digitalWrite(S3, LOW);

// Reading the output frequency

frequency = pulseIn(sensorOut, LOW);

int R = frequency;

// Printing the value on the serial monitor

Serial.print("R= ");//printing name

Serial.print(frequency);//printing RED color frequency

Serial.print(" ");

delay(50);

// Setting Green filtered photodiodes to be read

digitalWrite(S2, HIGH);

digitalWrite(S3, HIGH);

// Reading the output frequency

frequency = pulseIn(sensorOut, LOW);

int G = frequency;

// Printing the value on the serial monitor

Serial.print("G= ");//printing name

Serial.print(frequency);//printing RED color frequency

Serial.print(" ");

delay(50);

// Setting Blue filtered photodiodes to be read

digitalWrite(S2, LOW);

digitalWrite(S3, HIGH);

// Reading the output frequency

frequency = pulseIn(sensorOut, LOW);

int B = frequency;

// Printing the value on the serial monitor

Serial.print("B= ");//printing name

Serial.print(frequency);//printing RED color frequency

Serial.println(" ");

delay(50);

if(R<925 & R>845 & B<910 & B>870){

color = 1; // Red

}

if(G<955 & G>860 & B<840 &B>803){

color = 2; // Green

}

if(R<1055 & R>1020 & B<750 & B>675){

color = 3; // Blue

}

if(R<770 & R>645 & G<930 & G>820){

color = 4; // Yellow

}

if(G<1090 & G>1045 & B<875 & B>840){

color = 5; // Orange

}

if (R<995 & R>960 & B<1180 &B>1105){

color = 6; // Brown

}

return color;

}