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ADVANCED PRODUCT DETECTING AND LINE FOLLOWER TROLLEY

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ABSTRACT

Nowadays, if a consumer would like to buy something at a shopping mall, consumers need to take the particular items from the display shelf and then push up the heavy cart to the cash counter. This ***Smart Shopping Cart*** will make your shopping activity more comfortable.The aim of the implementation is to demonstrate that the ***Smart Shopping Cart*** can be used to reduce Man power and pushing the heavy items on the trolley. The implementation is an ***Smart Shopping Cart*** that consists of a Infrared Sensor which senses the path created on the floor ,Ultrasonic Sensor to calculate the distance and Color Sensor to identify the specified color. The developed product is easy to use, economical and does not require any special training.The project used heavy-load motorfor smooth moving of the cart. This feature is very useful for pregnant women, elder or disables people to shop conveniently. The developed product is easy to use, economical and does not require any special training..

I. INTRODUCTION

In the cutting edge world, each market and hypermarkets utilize shopping bins and shopping trolleys with a specific end goal to help clients to choose and store the items which they plan to buy.

These days, if a shopper might want to purchase something at a shopping mall, consumers need to take the specific things from the show rack and then queue up and sit tight for their swing to make installment.

Currently available method in shopping malls is to push the trolley wherever they go and pick the items. In this method the consumer will face difficulty to push the cart when it is filled with the items .the consumer also search for every item and find difficulty in searching the required items from the display shelves.

Our intention is to produce a product which helps clients in better way before they reach to shopping mall they can send a message with product list to operator port which will select the free trolley and generate OTP. Once customer enters the mall they can feed OTP to that previously identified or preserved trolley that will guide customers to their respective products. After loading all products one by one to the bin it will guide to the next until list gets over. Finally after collecting all goods it will come back automatically to its original position and generates bill. This will save much more time of a consumer also help them to take all necessary items without slipping once memory.

II. LITERATURE SURVEY

Today standardized tags are found on relatively everything. Standardized identifications are a widespread innovation in that they are the standard for retail items; stores that claim a scanner tag per user can process scanner tags and engraving it on the items. The most essential factor that is associated with scanner tag checking is that the item ought to be in the Line of Sight (LOS) of the per user keeping in mind the end goal to get the standardized tag engraved on the item filtered. In 2009, the University of Arkansas Information Technology Research Institute finished an examination to decide the business estimation of RFID thing level labeling for everyday tasks at a noteworthy extravagance retailer. The chain's administration assessed the utilization of RFID labels in the denim class. The outcomes exhibited that general stock precision enhanced by

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in excess of 27 percent, under stocks diminished by 21 percent, and overloads diminished by 6 percent. The investigation likewise contrasted to what extent it took with check things utilizing RFID versus a scanner tag per user. With RFID, checking 10,000 things took two hours; examining with a scanner tag per user took 53 hours. This converted into a normal of 4,767 checked things for every hour utilizing RFID, and 209 things for each hour utilizing a scanner tag framework—a 96 percent decrease in cycle-tallying time [2].

About 15 billion sets of shoes and 10 billion design attire things dispatch from producers consistently. The expenses for leading manual stock of these things, overseeing out-of-stocks, and forestalling burglary keep on rising. Clothing retailers are quickly receiving thing level following to empower precise perceivability of each piece of clothing. Interminable inventories are running at 60-70 percent continuously, making it hard to settle on proactive business choices for making in-store deals lift. Claim to fame clothing retailers that plan, source, and offer items bearing their own particular brands are acknowledging critical outcomes, for example, a 14 percent deals lift and a 90 percent decrease in the time required to lead week by week stock [3].

III. METHODOLOGY

Fig..1 Flow chart of line following trolley

The rationales of the calculation help to recognize whether there is need of water to plant. Further, rationales and basic leadership conditions help soil dampness state of the dirt and it generally keep up dampness and furthermore the client gets the status of the engine on the versatile. To start with the dampness sensor detects the dirt.

The yield of the dampness is in the simple frame. The ADC of the Arduino changes over the yield of the dampness sensor into advanced shape. The computerized esteem is then send to the Raspberry pi through RF module which chooses whether to soil is wet or dry and as indicated by that water the plant. On the off chance that the dirt is dry, Raspberry pi impels the hand-off and water pump begins which prompts water to stream. In the event that the dirt is wet, Raspberry pi turns the transfer of accordingly water pump is off and water stream stop.

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IV. COMPONENTS REQUIRED

A. Shopping Trolley

Fig.2 Shopping trolley

B. Gears

These are wheel-like formed segments that have similarly separated teeth around their external outskirts and it draws in another toothed system with a specific end goal to alter the speed or course of transmitted movement. Gears are mounted on rotatable shafts with the teeth on one gear meshing with the teeth of the other gear and thus transmitting rotary motion in the process. This also causes transfer of torque from one part of the machine to the other.

C. Spur Gears

These types of gears have teeth that are aligned in a direction parallel to the gear axis and they are designed to mesh with another spur gear that is in a parallel shaft. They are the most commonly used and are the least expensive. However they cannot be used when direction change between two shafts is required. The figure below shows an illustration of a spur gear.

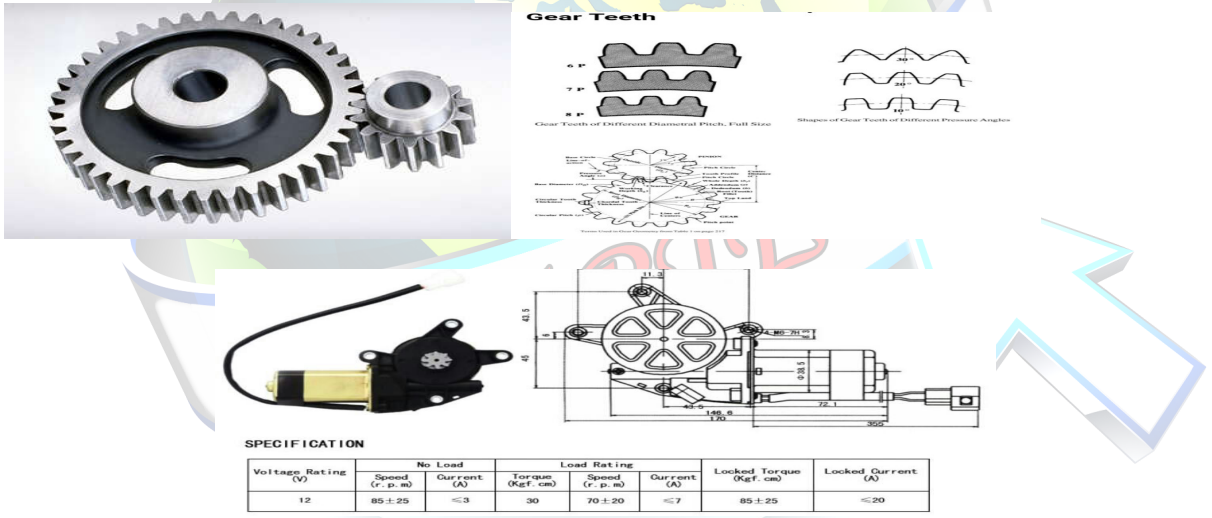

Fig. 3 Gear, Motor for shopping trolley

D. Arduino

Fig. 4 Arduino board

Arduino refers to an open-source electronics platform or board and the software used to program it. Arduino is intended to make gadgets more available to craftsmen, creators, specialists and anybody keen on making intuitive articles or situations. An Arduino board can be obtained pre-gathered or, in light of the fact that

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the equipment configuration is open source, worked by hand. In any case, clients can adjust the sheets to their necessities, and refresh and disseminate their own particular variants.

Flash memory: 32KB nonvolatile memory. This is used for storing application, which explains why you don't need to upload your application every time you unplug arduino from its power source.

SRAM memory: 2KB volatile memory. This is used for storing variables used by the application while it's running.

EEPROM memory: 1KB non volatile memory. This can be utilized to store information that must be accessible even after the board is shut down and after that controlled up once more.

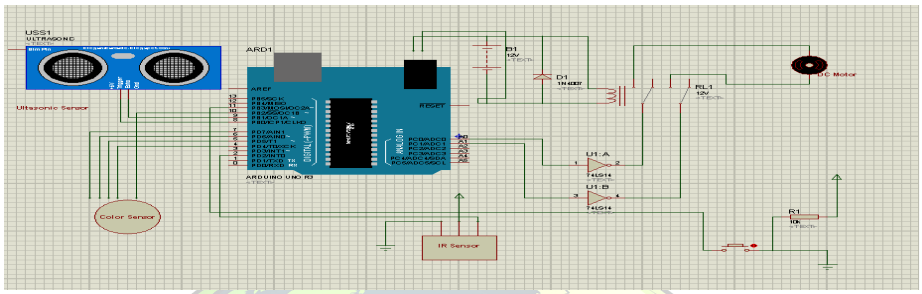

Fig. 5 Circuit Diagram

This includes the details about technologies used for the implementation of this project and control flow of all the modules and sub modules.

CODE SNIPPETS

```
define buzzer 3
#define s0 4
#define s1 5
#define s2 6
#define s3 7
constinttrigPin = 8;//distance sensor
constintechoPin = 9;
int motorA0 = 14;//robot motors
int motorA1 = 15;//
int key = 11;
long duration;
intdistanceCm;
booleannet_flag,start;
int sensor = HIGH;
int red;
intgrn;
intblu;
String color ="";
int count = 0;

digitalWrite(s1,HIGH);
net_flag=1;
start=1;
digitalWrite(buzzer,HIGH);
delay(1000);
digitalWrite(buzzer,LOW);
Serial.begin(9600);
}
void loop()
{
while(net_flag)
```

```
longstartTiming = 0;
longelapsedTime =0;
void setup()
{
pinMode(motorA0,OUTPUT) ;
pinMode(motorA1,OUTPUT) ;
pinMode(buzzer, OUTPUT);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
pinMode(s0, OUTPUT);
pinMode(s1, OUTPUT);
pinMode(s2, OUTPUT);
pinMode(s3, OUTPUT);
pinMode(outPin, INPUT);
pinMode(key, INPUT);
digitalWrite(motorA0, LOW);
digitalWrite(motorA1, LOW);
pinMode(LS1, INPUT);
digitalWrite(s0,HIGH);

  {
sensor = digitalRead(LS1);
delay(1);
if(sensor== HIGH)
      {
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
```

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```
distanceCm= duration*0.034/2;
Serial.println(distanceCm);
if(distanceCm<40)
            {
digitalWrite(motorA0, LOW);
digitalWrite(motorA1, LOW);
delay(1000);
getColor();
if (DEBUG) printData();
delay(2000);
if(color=="BLACK")
              {
digitalWrite(buzzer,HIGH);
delay(1000);
digitalWrite(buzzer,LOW);
delay(500);
Serial.println("Black");
while(color=="BLACK")
  {
getColor();
if (DEBUG) printData();
delay(2000);
                }
delay(1000);
              }
Serial.println("No color");
digitalWrite(motorA0, HIGH);
delay(1000);
}
else
            {
digitalWrite(motorA0, HIGH);
delay(100);
start=0;
            }
 }
else
        {
if(start==0)
net_flag=0;
digitalWrite(motorA0, LOW);
digitalWrite(motorA1, LOW);
          }
    }
delay(2000);
while(digitalRead(key));
digitalWrite(motorA0, LOW);
digitalWrite(motorA1, HIGH);
delay(2000);
while (digitalRead(LS1));
delay(100);
digitalWrite(motorA0, LOW);
digitalWrite(motorA1, LOW);
delay(1000);
net_flag=1;
start=1;
}
voidgetColor()
{
readRGB();
if (red > 200 && red < 1000 &&grn> 190 &&grn<
1000 &&blu> 180 &&blu< 1000)color =
"BLACK";
else color = "No COLOR";
}
red = red/n;
grn = grn/n;
blu = blu/n;
}
voidprintData(void)
{
Serial.print("red= ");
Serial.print(red);
Serial.print("   green= ");
Serial.print(grn);
Serial.print("   blue= ");
Serial.print(blu);
Serial.print (" - ");
Serial.println (color);
 // Serial.println (" detected!");
```

V. RESULTS AND DISCUSSION

The results of the system is as shown below

Hardware Part


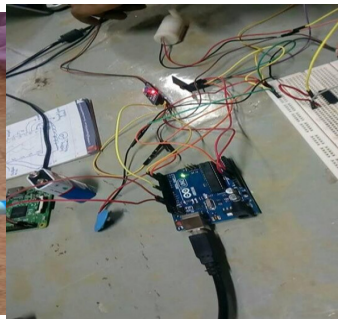


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Fig. 6 Trolley with complete kit and Arduino connection

VI. CONCLUSION AND FUTURE SCOPE

The progress in science & technology is a non-stop process. New things and new technology are being invented. As the technology grows day by day, we can imagine about the future in which thing we may occupy every place. This task is utilized as a part of shopping complex for buy the items. In this venture RFID card is utilized as security access for item. On the off chance that the item is placed in to the trolley implies it will demonstrate the sum and furthermore the aggregate sum. In any case, in this undertaking RFID card is utilized for getting to the items. So this task enhances the security execution and furthermore the speed. The rule of the improvement of science is that "nothing is incomprehensible" So we might anticipate a splendid and refined world.

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