

## DESIGN AND FABRICATION OF AN AUTOMATIC CONVEYOR BELT WITH LABELING MACHINE

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**Abstract-** The automated sorting machine has been counseled to be intricate and a global problem. This is due to the fact of the lack of potential of sorting machines to encompass flexibility in their format concept. This research on the other hand designed and developed a sorting object (which is automated) of a conveyor belt. It is generally use in Automatic labeling on airplane & transportation of specific product to a preferred neighborhood through conveyor belt. We can also can label round shape products & measure dimension of the products by using it. It consumes our time to making product& it can handle huge products with low cost at hazard environment. The entire machine is automated, so there is less opportunity of mistake. The installation value and jogging cost of this machine is very low. So, it is very economic. It is mainly synchronized by two systems using, IR sensor and microcontroller. To select design factors and fabricate a conveyor belt which runs with DC motor. The proposed developed mannequin of this research may want to be adopted at any group or industries; whose practices are based on mechatronics engineering systems. It is easy to make, just constructed the structure of the project & then build a circuit to control the movements. And need a program the microcontroller with Micro C. Then, we get our expected output. This result exhibit that the machine was done packaging in a short time. In addition, the results bought showcase that the system in a function to decreases product time, and make bigger product fee as in contrast with usual guide system. Though, there has many barriers like modern technological know-how is unable to automate all the desired tasks, it is an automation system, so there is much less and much less labor to be saved or high-quality improvement to be gained. These challenges have been solved by searching from distinctive sources & want greater lookup & improve it.

**Keywords:** Mechanical spring, Iron bar, Aluminum berm, Round Scale, Rack & Microcontroller, LCD, Base.

### 1. INTRODUCTION

A conveyor belt is the carrying medium of a belt conveyor system. A belt conveyor system is one of many types of conveyor systems.[1] More and more manufacturers of automated equipment are looking to conveyor belts as an integrated part of their systems and products. Today's industrial automation belts must often resist attack by industrial oils, grease and chemicals. They often need to operate effectively in low or high temperatures.[2] So, it is important to automate production of multiple varieties of goods, in moderate quantity, as well as achieving higher productivity and requiring investment planned equipment. Automation is a technology that is concerned with the use of mechanical, electrical and computer-based systems in the operation and control of production. Thus, most of leading companies use automatic conveyor belt for material handling and automatic labeling machine for labeling their product. Most of these devices are PLC controlled but some simple devices are microcontroller controlled. The work to be done in this project is to

design and fabrication of an automatic conveyor belt with labeling machine. Here, the conveyor belt will handle the products and a simple labeling device will label on the products.

### 2. RELATED WORKS

Conveyance systems can be very basic, such as rolling pin-style conveyor belts, which rely on momentum built up from slopes to transport materials. However, conveyance systems can also be entirely mechanized and automated for the transportation of heavier materials and for interaction with automated production lines.[3] Primitive conveyor belts were used since the 19th century. In 1892, Thomas Robins began a series of inventions which led to the development of a conveyor belt used for carrying coal, ores and other products. In 1901, Sandvik invented and started the production of steel conveyor belts. In 1905 Richard Sutcliffe invented the first conveyor belts for use in coal mines which revolutionized the mining industry. In 1913, Henry Ford introduced conveyor-belt assembly lines at Ford Motor Company's Highland Park, Michigan factory. In 1972, the French society REI created in New Caledonia the longest straight-belt conveyor in the

world, at a length of 13.8 km. Hyacinthe Marcel Bocchetti was the concept designer.

### 3. DESIGN

#### Schematic Design

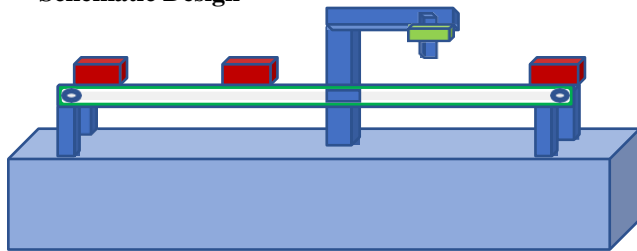


Fig 1: Schematic Design

#### Design Factors

The following factors are considered to design the project:

1. Material strength
2. Elasticity of the belt
3. Labeling time
4. Length
5. Velocity of the motors

### 4. IMPLEMENTATION

From beginning to final result the project follows some specific steps:

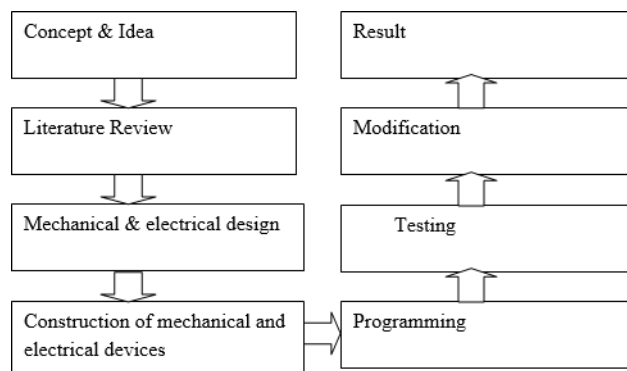


Fig 2: A general Flow chart of conveyor belt

### 5. ARCHITECTURE

Typical common architectures are shown below:

#### DC motor

A DC motor is a mechanically commutated electric motor powered from direct current [Fig:2] . The stator is stationary in space by definition and therefore its current. The current in the rotor is switched by the commutator to also be stationary in space.



Fig 3: DC motor

#### Shafts

In a machine, rotating shafts are the most important thing. Imbalanced rotating shafts will hamper any machine [Fig: 3]. Balance shafts are most common in machines which, due to the asymmetry of their design, have an inherent second order vibration which cannot be eliminated no matter how well the internal components are balanced. This vibration is generated because the movement of the connected rotating bodies thus during a given period of rotation, we have to check the balance of the shafts.



Fig 4: Shafts

#### Bearing

A bearing is a machine element that constrains relative motion between moving parts to only the desired motion[Fig:4].The design of the bearing may, for example, provide for free linear movement of the moving part or for free rotation around a fixed axis; or, it may prevent a motion by controlling the vectors of normal forces that bear on the moving parts.



Fig 5: Bearing [4]

#### Wooden structure

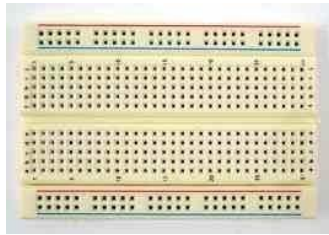
Actually, it is a base where the whole setup stands. All the other components are situated on the wooden base. It works as a support for the shafts, holds the bearing and motors.

#### Rubber belt

The belt is made with heavy duty rubber. I have collected this rubber and cut it at specific size. Then I connected it with the shafts. When the shafts are rotating with the DC motor then the conveyor also rotates.

#### Breadboard

A breadboard is a solder less device for temporary prototype with electronics and test circuit designs. Most electronic components in electronic circuits can be interconnected by inserting their leads or terminals into the holes and then making connections through wires where appropriate.

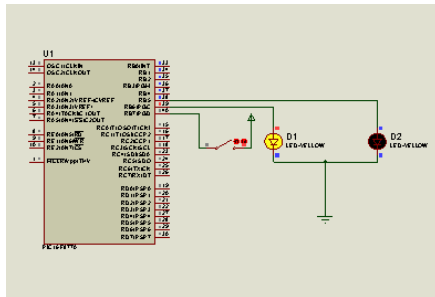


**Fig 6:** Breadboard

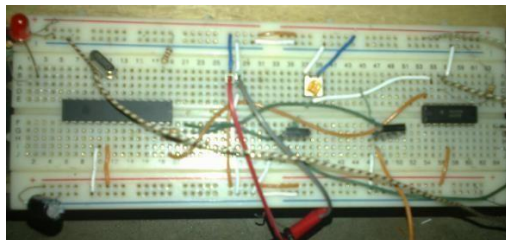
## 6. CONSTRUCTION

I layout and fabricate an automatic conveyor belt with labeling machine. For this purpose, I studied specific types of motions, manipulate systems, sensors and energy supply. I have compared linear motion with angular action and tried to choose the appropriate one. Here angular movement is simplest and value effective. At first, I built the shape of the project, and then I construct a circuit to manage the movements. I have to program the microcontroller with MicroC. At last I obtained my favored output.

### Circuit Diagram



**Fig: 7** Circuit diagrams



**Fig: 8** Circuit Board

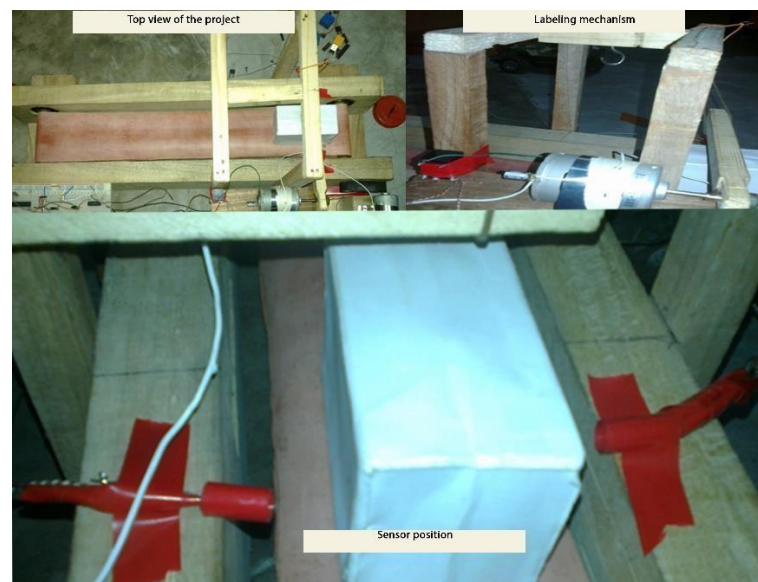
### Program

I write a program for my project. It was written in MikroC language. The program is below-

```
void main()
{
    trisb=0b10000000;
    portb=0;
    while(1)
    {
        if(portb.f7==1)
```

```
{portb.f5=1;
portb.f6=0;}
else if(portb.f7==0)
{portb.f5=0;
portb.f6=1;
delay_ms(100);
portb.f5=1;
portb.f6=0;
while(portb.f7==0);
}
}
```

### Implementation of the circuit in Mechanical section



**Fig: 9** Construction of automated sorting machine

## 7. CONCLUSION

### Discussion

Now a days a highly competitive industrial manufacturing, the management of the highly integrity of supply of a production, through raw material to delivered finish product, through quality manufacturing is of paramount importance. To accelerate the process and to maintain the quality of the products, automation is required. So, my project of automatic conveyor belt with labeling machine is an excellent ne because of its wide implementation and working principle. By applying the idea of this project an industry can easily label the required project and convey it. Through it has some limitations, by some modification this concept can be implemented in wide range of application.

### **Further Recommendations**

Effectiveness of this undertaking can be elevated by way of following this-

- 1) An extra electricity can be covered for the absence of mains.
- 2) The restricted motor strength limits the mechanical structure and a heavy shape can be acquired growing strength to have a smarter look & more positive power.
- 3) Taking extra care of the touchy devices from the unwanted emissions can increase sensitively.
- 4) Labeling on spherical floor can be performed through some modification.
- 5) Improving the sensor quality, labeling can be achieved more accurately.
- 6) Decreasing time delay, one can make the technique fast.

### **8. REFERENCE**

1. [https://en.wikipedia.org/wiki/Conveyor\\_belt](https://en.wikipedia.org/wiki/Conveyor_belt) [July20, 2019; 20:30]
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