International Journal of Advance Research in Engineering, Science & Technology(IJAREST),
ISSN(O):2393-9877, ISSN(P): 2394-2444,
Volume 2,Issue 5, May- 2015, Impact Factor: 2.125

Microcontroller Based Automatic Paint Marking Machine

Asst Prof DipaTeraiya [1], Asst Prof Ravi Raval[2]

[1] Electrical Engineering Department, C.U.Shah College of Engineering & Technology, teraiyadipa@gmail.com
[1] Master of Computer Application, C.U.Shah College of Engineering & Technology, Ravi_raval22@yahoo.co.in

Abstract

The automated paint marking machine is a new innovative concept which we have designed for marking any plain surfaces when power supply is given. The main aim of this concept is to reduce the human effort and save time for marking works. For the complete working of the machine the codes are coded in the embedded C with the help of microcontroller and converted into electronic chips which are fixed in the prototype. The end for the axis is detected using proximity sensor; once the sensor detect, the conveyor belt is operate. The program coding is made in such a way that the marking the object. So that the marking has perfection; this set up can be used in all kinds of construction for marking any plain surface of object.

Keywords*-Sensor; Microcontroller; LCD; Radar; Relay*

I. INTRODUCTION

The project model will be based on defined conditions of the marking for paint. Based on the conditions of marking points, controller will be give commands to the respective position for the marking movements. The movement will be done by arm system. The project will be based on automatic paint marking by using microcontroller. Paint marking operations are working based on manual mark with manpower works. Due to manual operation, accuracy and quality of marking are tough for the specific jobs. Hence errors are happen to occurs to the repetitive jobs also with automatic paint marking machine this problem will short out and higher jobs also can be taken for the marking. The project model is classified into three system as moving system, arm system and marking system. The objects are moving to the specific location where it to be paint by conveyor system. When object is stop at the specific location, and arm system will operate to rotate it for the detection of the mark based on the mark, marking system with arm will make the object to be paint.

II. LITERATURE REVIEW

The primary aim of the project is to design, develop and implement Automatic marking machine which helps to achieve low cost marking equipment. Despite the advances in robotics and its wide spreading applications, interior marking machine has shared little in research activities. Also the nature of marking procedure that requires repeated work and hand rising makes it boring, time and effort consuming. When construction workers and robots are properly integrated in object tasks, the whole construction process can be better managed and savings in human labour and timing are obtained as a consequence. In addition, it would offer the opportunity to reduce or eliminate human exposure to difficult and hazardous environments, which would solve most of the problems connected with safety when many activities occur at the same time. These factors motivate the development of an automated paint marking machine.
Accordingly, the consumption of marking paint is hard to track and/or control as the cost of individual dispensers is generally thought of as insignificant by the marking technicians who, therefore, tend to be Wasteful. For example, marking paint dispensers are often discarded before being completely emptied. Consequently, over time a significant mount of useful marking paint may be Wasted, and, in addition to environmental concerns, the cost of supplying and/or replenishing the marking paint is not optimized.

III. DESIGN OF HARDWARE

3.1 Circuit Diagram

The conveyor belts are connected to motor (m1).with the help of conveyor belt object will be move forward. The proximity sensor is use with the help of sensor conveyor belt star and stop. second part of hardware is arm machine .arm machine are moveable with the help of motor (m2).arm stick is connected to arm machine .it will be move forward and reverse with the help of motor (m3).arm machine is connected to the microcontroller.2 line Lcd display connected to microcontroller .operation will be notification by the Lcd display.

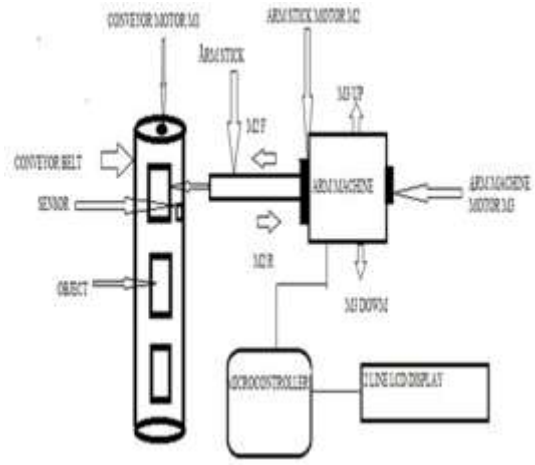

Figure 3.1 Hardware Block diagram

3.2 LIST OF COMPONENT

1. DC MOTOR:-

We used 12v DC motor in our project. A DC motor relies on the fact that like magnet poles repels and unlike magnetic poles attract search other. A coil of wire with a current running through it generates an electromagnetic field aligned with the centre of the coil. By switching the current on or off in a coil its magnetic field can be switched on or off or by switching the direction of the current in the coil the direction of the generated magnetic field can be switched 180°. A simple DC motor typically has a stationary set of magnets in the stator and an armature with a series of two or more windings of wire wrapped in insulated stack slots around iron pole pieces (called stack teeth) with the ends of the wires terminating on a commentator. The armature includes the mounting bearings that keep it in the centre of the motor and the power shaft of the motor and the commutation connections.

2. CONVEYOR BELT:-

Belt conveyors are the most commonly used powered conveyors because they are the most versatile and the least expensive. Product is conveyed directly on the belt so both regular and irregular shaped objects, large or small, light and heavy, can be transported successfully. These conveyors should use only the highest quality premium belting products, which reduces belt stretch and results in less maintenance for tension adjustments. Belt conveyors can be used to transport product in a straight line or through changes in elevation or direction. In certain applications they can also be used for static accumulation or cartons.

3. PROXIMITY SENSOR:-

A proximity sensor is a sensor able to detect the presence of nearby objects without any physical contact. A proximity sensor often emits an electromagnetic field or a beam of electromagnetic radiation (infrared, for instance), and looks for changes in the field or return signal. The object being sensed is often referred to as the proximity sensor's target. Different proximity sensor targets demand different sensors. For example, a capacitive or photoelectric sensor might be suitable for a plastic target; an inductive. Some sensors have adjustments of the nominal range or means to report a graduated detection distance. Proximity sensors can have a high reliability and long functional life because of the absence of mechanical parts and lack of physical contact between sensor and the sensed object. Proximity sensors are commonly used on smart phones to detect (and skip) accidental touch screen taps when held to the ear during a call. They are also used in machine vibration monitoring to measure the variation in distance between a shaft and its support bearing.

INTERFACING OF LCD WITH THE 8051:-

The circuit I describe here is a very basic setup for driving a 2x16 character HD44780-based LCD from an Atmel ATmega16. It uses (a slightly modified version of) Ron Kreymborg's lcd16 (described above), and should work on most AVR controllers, when compiled with AVRGCC (e.g. Win AVR).When you choose a library for driving an LCD, it is important to note if it makes any constraints on the I/O-ports used. lcd16 uses bi-directional communication with the LCD, so we need to use the R/W-line. Furthermore the module uses 4-bit mode and the data-bits must be on the low for bits of a port (the port used can be changed in a header-file before compilation). The three additional I/O-lines are in the same port, so apart from being able to use the last bit for something else, this library takes up an entire 8-bit port of the microcontroller. In the example presented here, I have simply used PORTD, which was the default configuration in the lcd16-library I downloaded. You may want to use a different port for your application, since the two low bits of PORTD are the ones used for the UART (in case your application needs to use serial communication).

CONCLUSION

All in all, this project achieved a lot of its goals. The project implemented a Low cost, automatic marking and monitoring using microcontroller Technology. So the implementation of the automatic paint marking machine was carried out effectively for various applications. It proves its importations for its simplicity and robustness and is use in many industries. For any control design approach understanding of the desired control system and how to use the a microcontroller to translate machine sequence of operation are the most important part , because it has direct effect on the system performance .This machines are very good for the paint marking based on the inputs. The application which we did can better be performed with some further improvements.

REFERENCES

[1] Muhammad Ali Mazidi, Janice Gillespie Mazidi, (2004). 'The 8051 Microcontroller and Embedded Systems', Seventh Edition, Pearson Education Asia.

[2] Advanced electronics microprocessor

(byJCOB&MILLMAN)

[3] Microcontroller and embedded system using Assembly and C By Muhammad Ali Mazidi ,Rolin Mckinaly .Released 2007
[4] Microcontroller: Internals, instructions,Programming & interfacing by Subrata ghosal.
[5] PIC Microcontroller : An Introduction to Software & Hardware interfacing by Han-Way Huang Publisher of Course Technology.