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Automatic Dishwashing Machine

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Abstract - We are living in twenty first century. This is the era of automation and is involved in every field such as research, production, entertainment, transportation, communication etc. As far as our project is concerned we are going to use automation in the field of cleaning. It's really unfair when we have to indulge our important time for cleaning and it becomes very much difficult for us to clean the utensils in a short time. To simplify these jobs we are making a machine which is automatically operated for cleaning purpose. This will definitely reduce a lot of hard work and also our precious time for other important tasks. This project proposes a method to do the tedious cleaning job very efficiently and quickly by controlling our dishwashing machine movements automatically. The dish goes through the different sections such as scrubbing, rinsing and drying which ultimately thoroughly cleans the dishes. In our day to day life we can see that in big hotels, messes, restaurants, large kitchen areas workers are assigned to clean utensils and lots of money is spend to complete that work.

1. INTRODUCTION

In this project, this system consists of three sections first is scrubbing, second is rinsing, and third is cleaning. A conveyor belt mechanism is used to execute the dish washing process scrubber is attached to a motor which rotates and cleans the dishes. A spray pump is used to wash the dishes after scrubbing process. A cleaner or sponge is attached to a dc motor along conveyor line to dry the dishes. Thus the cleaning gets complete. Conveyor passes the washed dishes while waster water is collected separately. All the water gets collected at one place because of innovative collector design. The IR sensor along with its signal conditioning circuit is used for counting the number of dishes and also it is used for monitor of dishes whether it comes under specific section or not. If dish is undetected that particular section is in off state. The number of dishes cleaned shall be shown on LCD this is done with help of IR sensor.

1.1 BLOCK DIAGRAM

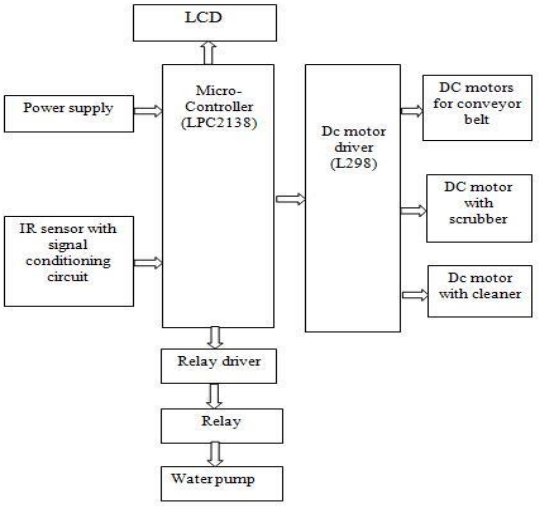


Figure 1:-block diagram

Block diagram consist of following components:-

1. Microcontroller LPC 2138
2. IR sensor with signal conditioning circuit
3. DC motor driver
4. DC motor for conveyor belt
5. DC motor with scrubber
6. DC motor with cleaner
7. Relay driver
8. Relay
9. Water pump
10. Lcd
11. Power supply

Why we use lpc2138?

1. 16/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package
2. 16/32 KB of on-chip static RAM and 32/64/128/256/512 KB of on-chip Flash program memory.
3. Up to nine edge or level sensitive external interrupt pins available.
4. Single 10-bit D/A converter provide variable analog output. (LPC2132/4/6/8 only).
5. Low power Real-time clock with independent power and dedicated 32 kHz clock input.

2. Flowchart/Algorithm

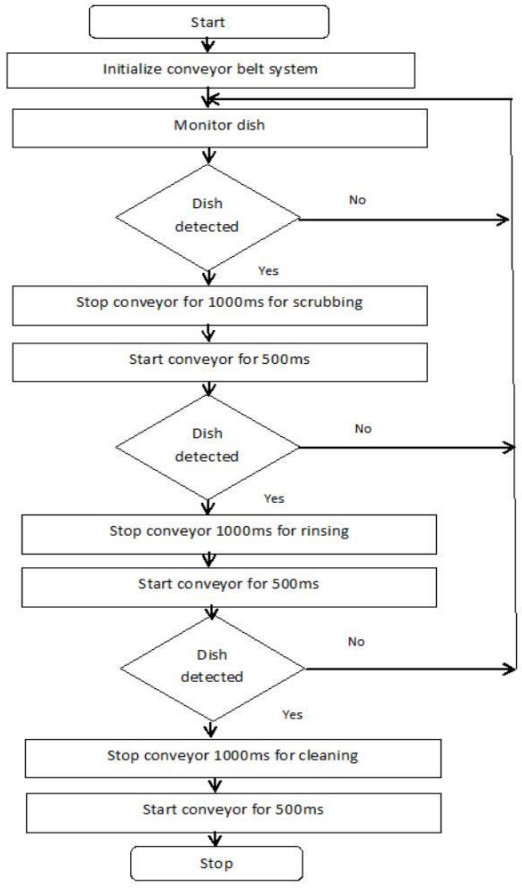
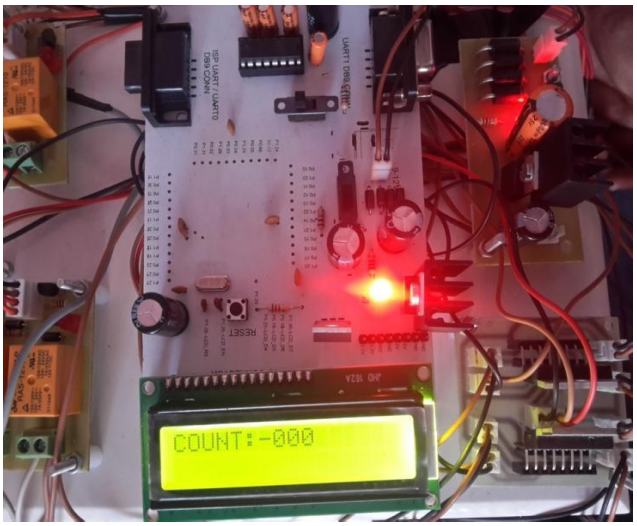
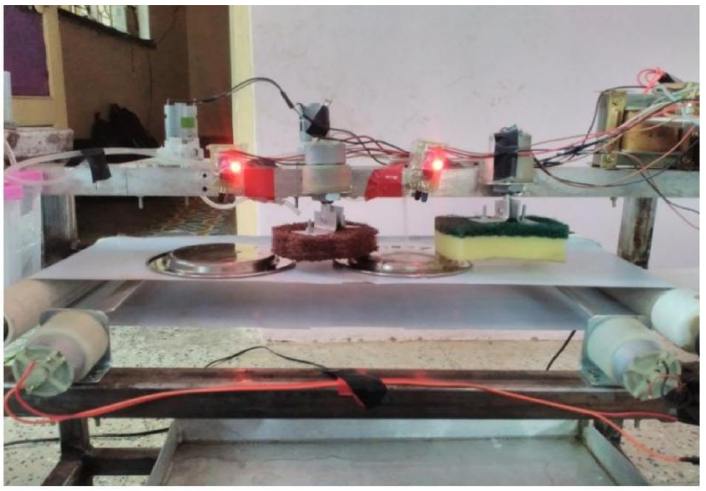


Figure 2:-Flowchart

3. SYSTEM PICTURES:-



PIC -1: Setup of initialization of system



PIC -2: Setup of dish monitoring

Advantages -The advantages of automatic dishwashing machine are as follows:

1. Better utilization of water
2. Very useful in reducing human effort
3. Saves time

Disadvantages -The disadvantages of automatic dishwashing machine are as follows:

1. Drainage system is not proper.
2. Time required per dish is more.
3. Cloth should be replaced with another cloth after every 15 days.

4. Conclusion

Thus we have designed and built prototype model for washing the dishes automatically. The prototype of the dishwashing machine is built and tested in laboratory for three sections which gives satisfactory results. This saves lot of time and man power. Improved water efficiency also means less detergent can be used which indirectly saves money. Our system is eco-friendly. And no experts are required to operate the machine.

5. Reference:-

[1] WESLEY C. COX, "An Automatically Controlled Dishwashing Machine "American journal of public Health and the nation's health, Volume 27, September 1937.

[2]WESLEY C. COX, "Use of Dishwashing Machines: Pasteurization of Eating Utensils" American journal of public Health and the nation's health, Vol. 28, Feb.1938.