



## Automatic Tube Feeding System

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### ABSTRACT

According to the survey in hospitals, listed that 30% of patients suffer paralysis due to hypertension in our country. In hospitals the paralyzed patient needs to be fed regularly which is major stress. The project is intended to replace the nurse with machine which gives feeding to the patient. By the use of automatic tube feeding system, the nurse can monitor the patient from distance. The advancement of tube feeding system helps hospitals to save time and man-power.

**Keywords :** Pre-Programmed, Peltier Plates, RTC, Atmel16A.

### I. INTRODUCTION

An infusion pump is an equipment which is commonly used in hospitals and to perfuse a liquid into the patient nostalgically. There are several types of infusion pumps which is semiautomatic and fully automatic [1]. Automatic tube feeding system is mainly used for body paralyzed patient who cannot able to perform any actions due to blood clots in brain. The flow control may be volumetric or non-volumetric [2]. A volumetric flow control gives the flow of liquid as desired amount, where the velocity and time, are programmed using embedded C. In a non-volumetric control, the pump controls the number of drops per seconds it is the small volume control unit [3]. The volume depends on the drop's size, varying with type of equipment, temperature, liquid viscosity and density. The advantages of controlled perfusion where the drop rate and flow rate can be controlled with respect to time, the automatic tube feeding system has advantage, where the flow and concentration of liquids can be changed

when needed. In this paper Peltier Plate is proposed in automatic tube feeding system for sterilization. The centrifugal pump turns on and off the liquid, which has to be given to the patient. Real time clock is used to give feeding to the patient in real time. It is effectively used in body paralyzed patient which helps in feeding the patient continuously without man power.

### ATMEL16 MICROCONTROLLER

ATMEL16 microcontroller is common to ATMEGA16 microcontroller with certain differences. Atmel 16 is an 8-bit microcontroller of AVR family. ATMEL16 is based on RISC, architecture with 130 instruction.

ATMEL 16 has high flash memory and endurance when compared with ATMEGA microcontroller

### A. RELAY

A relay is an electrically operated switch. It acts as a switch to initiate the device. Current in the coil of

the relay produces magnetic field. The relay helps in converting the voltage from high to low as well as from low to high voltage.

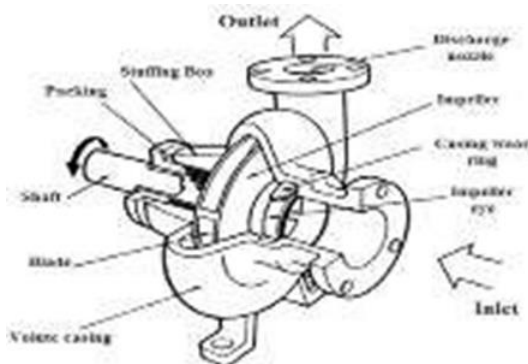
**B. PELTIER EFFECT**

The Peltier effect is a temperature difference which is created between two dissimilar metals. the heat as a source passing on one side of the plate where heat is generated and on other side of the metal cooling is generated. In this method the Peltier plates are used to sterilize the liquids by heating the liquid on rough surface of the plate and cooling the liquid on the smooth surface of the plate. Due to difference between these two metals the voltage is generated. This is similar to see beck effect and Thomson effect.

**C.PUMP**

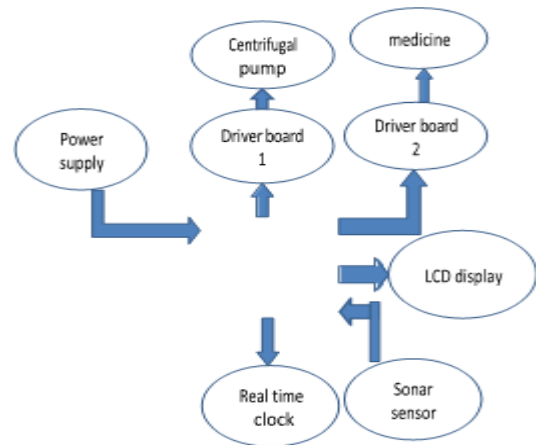
A centrifugal pump is a rotational device, it helps in diluting the medicine in water and after diluting the medicine is given to the patient through the centrifugal pump. The impeller acts as a tap for turning on the liquid and turning off the liquid flow from the pump. The casing in the centrifugal pump acts as a Centre tapped system to control the flow liquid given to the patient.

It has shaft in centrifugal pump which rotates in clockwise and in anticlockwise direction to assist the process of diluting the medicine in water.



**Figure 1.** Centrifugal Pump

**BLOCK DIAGRAM**



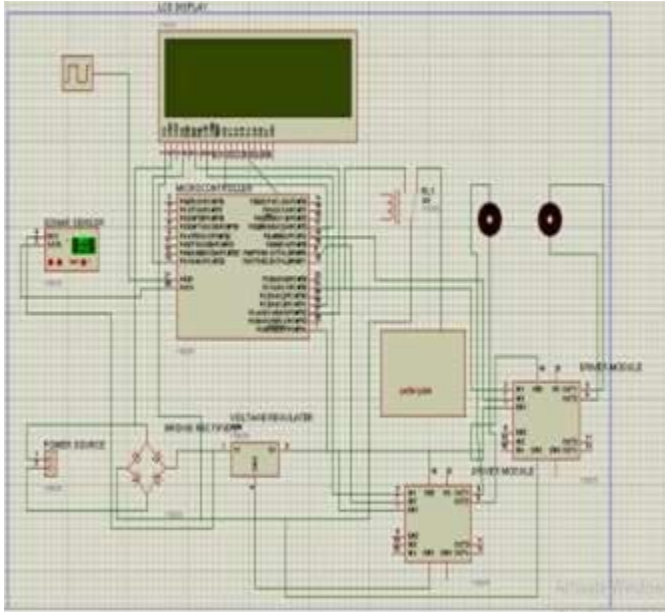
**Figure 2 :** Automatic Tube Feeding System

The block diagram mainly consists of three driver board, one driver board is connected to centrifugal pump, second driver board is connected to Peltier plate and the relay driver board is connected to medicine. Power supply is given to IC Atmel16A circuit. Due to the power supply, the driver boards are activated consecutively. when the food is to be given to the patient driver board 1 and relay driver are activated. Due to this, the Peltier plate heats and cools the sample and the centrifugal pump opens the required amount of flow to the patient and closes the pump after the delivery is given to the patient. Atmel 16A 3microcontroller has a RTC which performs RTC in real time. we can able to perform the operation, even when there is power failure. The sonar sensor indicates the level of liquid remaining in the container, which can visualize in LCD display.

**CIRCUIT DIAGRAM**

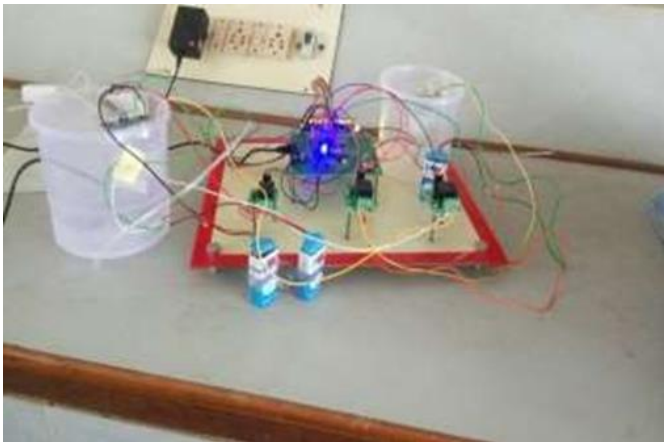
The time, date and liquid supply mL/hour is pre-programmed in the Atmel16A micro-controller. The Peltier plates is being used to sterilize the milk, medicine and water. The RTC controller is a 24/7 format process the time accuracy is maintained by

Real Time Clock. The centrifugal pump acts as tap to turn on and off the flow of liquid.



**Figure 3.** Circuit Diagram

## II. RESULT



**Figure 4.** Result

The automatic tube feeding system is programmed and device carries the process of feeding to the patient continuously. The driver activates the centrifugal pump in the food container which gives feeding to the patient followed by the medicine in the other container. Thus, alternatively the medicine and food are given to the patient. The project gives solution to the hospital to reduce time consumption.

## V. CONCLUSION

Time consumption to feed the patients individually is highly increased in a multispecialty hospital. This could be overcome with the help of automatic tube feeding system. It gives feeding to the patient without any need of man power. It helps hospitals to save time and manual assessment. The feature of detecting clots in tube could be implemented. It would be able to detect the miscarriage of food in larynx and other artifacts with help of detector in future.

## III. REFERENCES

- [1]. A. Drumea, Al. Vasile, " Infusion pump medical system controlled with modem system on chip devices ", 29th International Spring Seminar on Electronics Technology- ISSE2006, St. Marienthal, Germany.
- [2]. "Embedded control handbook - Volume 1", Microchip Inc.
- [3]. Lutz Bierl, "Das grosse MSP430 Praxis Buch", Frenzier.
- [4]. Chris Nagy, "Embedded system design using the TI MSP430 series (Embedded Technology series)", Newnes.

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