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Glucose level monitoring system using GSM

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Abstract: Patient tracking structures is the time period for all the numerous gadgets that are used to supervise sufferers. One category of such devices is devices that indicators if the affected person gets right into a critical state. In our proposed method focuses on to monitor & initiate alert to doctors approximately the sufferers at some points of glucose journey injections. In our proposed device it will done four main duties, the flow of glucose will stopped, the float degree to be managed, while the liquid degree underneath the brink cost will upward push alarm and intimate to corresponding individual through wireless, then the any injections be applied means it is going to be automatically injected depends on the time based totally. All the actions are controlled through microcontrollers. And sensors are used to degree the price of liquid, and different feature primarily based motor.

KEYWORDS: Programmable IC, actuator, blood carrying bottle, solenoid valve, microcontroller, ultrasonic sensor.

I. Introduction:

A drip is used for the patient when the patient becomes unhealthy. In the time of operations the food cannot give to the patient that time the trip was provide for their health. If it overflows it also cause any problem for that we use an at automatic flow control drip. Automatic flow control of blood in drip is done with the help of sensing the amount of the level in the bottle. A level sensor is placed outside the bottle. It can be measured with the help of variations in the level. The main components are programmable IC, actuator, blood carrying bottle, carrying stand and power supply. The major advantage of the work is that; when we are not able to stop the flow of fluid or if we made some careless mistake there is a chance to reflow of the fluid into the bottle. It may damage the human body and may tend to cause death. By using this method we can automatically close the valve in the absence of the human operator. The sensing of the Level of bottle is taken initially and the bottle without fluid is taken as the set point. When the fluid reaches the value same as the set point and the sensor provide the signal and the programmable IC starts working. At the same time the motor starts rotating and the valve will be closed at the same time the wireless alarm attached to the setup will provide alert signal to the operator. These techniques is considering for the automatic control of blood injection[1-5].

Materials & Methods:

A and a negative potential at point B. the positive potential at point A will forward bias D3 and reverse bias D4. The negative potential at point B will **1**

Transformer :

The potential transformer will step down the power supply voltage (0-230V) to (0-15V) level. If the secondary has less turns in the coil then the primary, the secondary coil's voltage will decrease and the current or AMPS will increase or decreased depend upon the wire gauge. This is called a STEP-DOWN transformer. Then the secondary of the potential transformer will be connected to the rectifier.

Bridge rectifier:

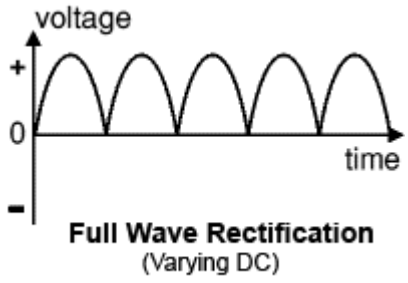


Fig1: Bridge Rectification

When four diodes are connected as shown in figure, the circuit is called as bridge rectifier. The input to the circuit is applied to the diagonally opposite corners of the network, and the output is taken from the remaining two corners. Let us assume that the transformer is working properly and there is a positive potential, at point forward bias D1 and reverse D2. At this time D3 and D1 are forward biased and will allow current flow to pass through them; D4 and D2 are reverse biased and will block current flow. The path for

current flow is from point B through D1, up through Load, through D3, through the secondary of the transformer back to point B. One-half cycle later the polarity across the secondary of the transformer reverse, forward biasing D2 and D4 and reverse biasing D1 and D3. Current flow will now be from point A through D4, up through Load, through D2, through the secondary of transformer, and back to point A. Across D2 and D4. The current flow through Load is always in the same direction. In flowing through Load this current develops a voltage corresponding to that. Since current flows through the load during both half cycles of the applied voltage, this bridge rectifier is a full-wave rectifier. One advantage of a bridge rectifier over a conventional full-wave rectifier is that with a given transformer the bridge rectifier produces a voltage output that is nearly twice that of the conventional half-wave circuit.This bridge rectifier always drops 1.4Volt of the input voltage because of the diode. We are using 1N4007 PN junction diode, its cut off region is 0.7Volt.So any two diodes are always conducting, total drop voltage is 1.4 volt shown in fig1.

Filter:

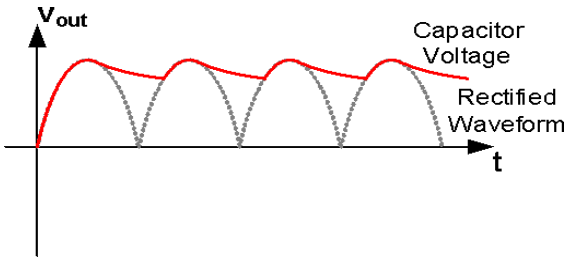


Fig 2: Filter

If a Capacitor is added in parallel with the load resistor of a Rectifier to form a simple Filter Circuit, the output of the Rectifier will be transformed into a more stable DC Voltage. At first, the capacitor is charged to the peak value of the rectified Waveform. Beyond the peak, the capacitor is discharged through the load resistor until the time at which the rectified voltage exceeds the capacitor voltage. Then the capacitor is charged again and the process repeats itself shown in fig2.

IC voltage regulators:

Voltage regulators comprise a class of widely used ICs. Regulator IC units contain the circuitry for reference source, comparator amplifier, control device, and overload protection all in a single IC. IC units provide regulation of either a fixed positive voltage, a fixed negative voltage, or an adjustably set voltage. A fixed three-terminal voltage regulator has an unregulated dc input voltage, it is applied to one input terminal, a regulated dc output voltage from a third terminal, with the second terminal connected to ground.The series 78 regulators provide fixed positive regulated voltages from 5 to 24 volts. Similarly, the series 79 regulators provide fixed negative regulated voltages from 5 to 24 volts. This is a regulated power supply circuit using the 78xx IC series. These regulators can deliver current around 1A to 1.5A at a fix voltage levels. The common regulated voltages are 5V, 6V, 8V, 9V, 10V, 12V, 15V, 18V, and 24V. It is important to add capacitors across the input and output of the regulator IC to improve the regulation. In this circuit we are using 7812 regulator so it converts variable dc into constant positive 5V power supply. If the input voltage goes to below 14.6Volt means the output also varied. That is why we are using 230/15V step-down transformer. Transformer output is higher than the regulator minimum level input.

II. Working Principle:

We have developed a remote drip infusion monitoring system for use in hospitals. The system consists of several infusion monitoring devices and a central monitor. This system works on the way that when the glucose or the medicine becomes empty the flow of medicine to the patients is automatically controlled. This application is done with the help of sensors and microcontroller action. The working principle behind this operation is that the sensor senses the variable and then it passes the signals to the microcontroller. Based on the output from the sensor the microcontroller starts working. By the combined action of the solenoid valve the flow gets stopped and it also alerts the operators aboutthe present status of the patients.. A medical infusion monitor and protection system is designed based on technologies of microcontrollers, solenoid valve and wireless communication, etc. The ultrasonic sensor senses the level of the bottle and transmits the signals to the microcontroller. The infusion signal is collected by infrared photoelectric conversion characteristic. SCMAT89C51 processes monitor data and control area infusion speed and controls wireless transceiver nRF905 to constitute wireless communication system to transmit data. Through the serial interface MAX487 connected main controller with each control node, upper PC can monitor and control each node in real-time and renew control-schemes.Experiments shown that the rate of infusion speed monitor error is less than 2 drop every minute, and stability time is faster, which effectively completes intelligent infusion system monitor and alarm.We proposed a new technique called automatic flow control in drip. This system is based on the level sensor and microcontroller. Our proposed system is to introduce to develop the mechanism without the involvement of the human operator the common people are suffering due to different diseases. The sensor based system provides better quality and precision. These techniques is considering for the automatic control of blood injection. It reduces the manual Operation and Time to monitor the sufferers continuously is not possible at all the time. Human interferences is needed for the sufferers. Diseases like DENGUE FEVER, DIAHHERA, MALARIA, CHOLERA, DYSENDRY,FEVER etc. are common in our country. Drips are commonly used in affected peoples to give food and medicine .If we are not able to stop the drip it then there is a chance of the fluid to be returned to the bottle. The blood flow through veins is at high pressure. That is why the blood is to be returned to the

bottle.Nowadays the medical field is so advanced, but in poor countries it is still undeveloped. So that we are introduce this device. The patients are suffering due to the different kinds of diseases. Drips are used to administer the food and If we are not able to stop the fluid flow then there is a high chance of the fluid to be returned to the body. The advantage of this project is to close the valve automatically in the absence of human operator. The control actions are done by the microcontroller. The motor starts rotating and the valve will be closed. The wireless alarm attached to the setup will provide the alert signal to the operator. These techniques are considered for the automatic flow control drip shown in fig3 &4.

The ac voltage, typically 220V rms, is connected to a transformer, which steps that ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation. A regulator circuit removes the ripples and also remains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes. This voltage regulation is usually obtained using one of the popular voltage regulator IC units shown in fig5&6.

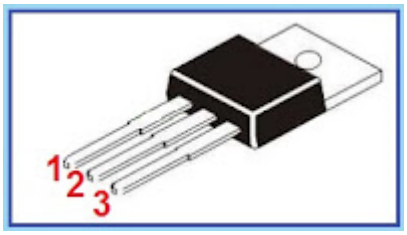
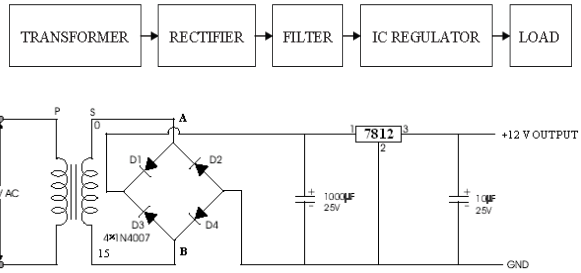


Fig 4:IC Regulators

78xx Regulator		
IC Part	Minimum Input Voltage	Regulated Output
7805	7.3V	5V
7806	8.4V	6V
7808	10.5V	8V
7809	11.5V	9V
7810	12.5V	10V
7812	14.6V	12V
7815	17.7V	15V
7818	21.0V	18V
7824	27.1V	24V

Table1: IC Regulator 78xx

III. PROPOSED SYSTEM:



IV. CONCLUSION

The presented automatic flow control in drip is realized as a small, compact and advanced technology in the medical field. Here the continuous flow of medicine through drip to the patient is automatically controlled. This can be done by measuring the level of medicine through the drip and is compared with set point and flow of medicine is stopped when it reaches the desired set point. This methods can be used for the overcoming of the careless mistakes done by the operators. With the addition of battery this design can monitor blood glucose levels while travelling or when the external current is not available. Further the processing time needed by LCD which is 60 seconds in our design can be further decreased by caliberation. It can be also provided with a dark box to place the sensor to prevent external light from passing through it as sensor contains a photo-detector, which detects IR light emitted by photo-emitter passing through the blood which can get attenuated by external light. A tight band can be worn over the hands to prevent them from shaking inorder to prevent disturbances in blood flow and hence more accurate results can be obtained.

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