An Infant Autonomous Incubator Design With High Secured Authorization Entry Using Wireless Application Protocol (WAP)

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Abstract- *The system is mainly focused towards incubator control based on sensor networks pasted on body of the fetus. The output of the system can be monitored in web server called IOT application can be viewed in wireless communication. One of the most important elements in a newborn's survival is the infant's temperature regulation. Mammals have the advantage of being homoeothermic, meaning that they are able to produce heat, enabling constant body temperature to be maintained .However a preterm new born infant needs special care because some vital organs and/or biochemical/enzyme systems may not have developed sufficiently, or because the growth of the fetus may have been disturbed , with the result that the infant is unlikely to survive undamaged without special protection . An infant is called preterm if it is born following a gestation period of less than 37 weeks .The preterm infant has several disadvantages in terms of thermal regulation . An infant has a relatively large surface area , poor thermal insulation, and a small amount of mass to act as a heat sink . This system developing towards the automatic heat generator based on fetus body temperature. The DS1820 sensor is used to detect the body temperature of the fetus . Based on the temperature output the microcontroller is varying the heating point of the heater the paramers of the neonate such has body temperature and heart pulse levels are monitoring through wireless web server(IOT). The system also introduce the smart communication system for authorized entry. The smart tag is fixed in authorized visitor token . The emergency alert is fixed in the incubator room . The emergency is activated by the controller when the people are entered in side the room without token.*

Keywords- Incubator autonomous,Wireless application protocol(IoT) and smart token

I. INTRODUCTION

One of the most important elements in a newborn's survival is the infant's temperature regulation. Mammals have the advantage of being homoeothermic, meaning that they are able to produce heat, enabling constant body temperature to be maintained in 37^0C. However a preterm newborn infant needs special care because some vital organs and/or biochemical/enzyme systems may not have developed sufficiently, or because the growth of the fetus may have been disturbed, with the result that the infant is unlikely to survive undamaged without special protection. An infant is called preterm if it is born following a gestation period of less than 37 weeks. The preterm infant has several disadvantages in terms of thermal regulation. An infant has a relatively large surface area, poor thermal insulation, and a small amount of mass to act as a heat sink. The infant has little ability to conserve heat by changing posture and no ability to adjust clothing requirements in a response to thermal stress. Responses may also be hindered by illness or adverse conditions such as hypoxia (below normal levels of oxygen). Heat exchange between the environment and the infant is like any physical object and its environment.

II. LITERATURE SURVEY

1. Md. Tarikul Islam Jue Department of Electrical and Electronics Engineering American International University-Bangladesh Dhaka, Bangladesh A Smart Auto-Balanced System for Incubation Process IEEE 2019.Temprature and humidity are the main parameters to be controlled in a hatching system for incubation process.

2. Virginia Hall, Eric Geise, and Nasser kashou Wright State University the IncuLight: Solar-powered infant incubator IEEE 2014.Two major objectives were (1) to design and build a compact light weight incubator**; (2)** to incorporate solar panel(s) to power the incubator.

3. Kornelius Pranoto Adi Automatic egg incubator design IEEE 2014.In this study designed a system of pultry egg incubator with temperature and humidity control automatically that can be monitored by computer and using solar cells to backup energy source.

III. EXISTING SYSTEM

Temperature and humidity are the main parameters to be controlled in a hatching system for incubation process. Maintaining of these highly sensitive natural elements is one of the major steps to breed healthy chicks in a hatching process. On the basis of providing an order of standardizing the operation and care to monitor the desired temperature and relative humidity, this paper proposes a system of incubation for the hatching of turkey birds. This incubation system is developed based on ATmega32A micro-controller using DHT22 temperature and humidity sensor. For monitoring purpose, LCD 20x 4 displays is used as well as an Android application. For the feature of user control system, button and Android application were used. This incubator is also very user-friendly and temperature and humidity can be of this project is to make this incubation system affordable to all the people involved with hatchery farm.

Problem identification

- Temperature and humidity parameters are monitored.
- There is no automation for controlling the heat and no alert for unauthorized human entry

IV. PROPOSED SYSTEM

The device may include an AC-powered heater; circulate the warmed air, a control valve through which oxygen may be added, and access ports for nursing care. With the technology available currently, incubators use microcontroller-based control systems to create and maintain the ideal microclimate for the preterm neonate. The parameters of the neonate such as body temperature, heart pulse rate are monitoring through wireless web server. The system also introduces the smart communication system for authorized entry. The smart tag is fixed in authorized visitor token. The emergency alert is fixed in the incubator room. The emergency alert is activated by the controller when the people are entered inside the room without token. All the fetus information is transmitting from PIC 16F877A microcontroller to IoT web server through ESP8266 Wi-Fi module.

V. BLOCK DIAGRAM

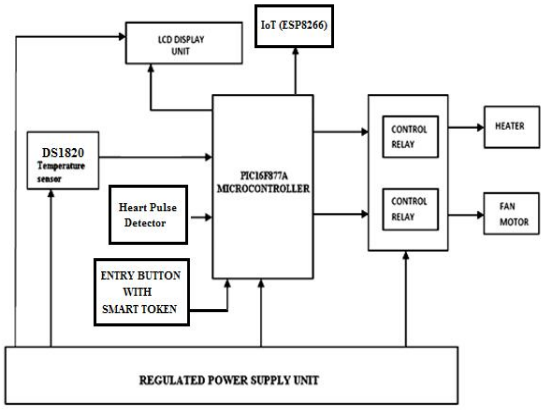

Fig 1- block diagram for incubator

Hardware requirements

- PIC16F877A microcontroller
- Entry button with smart token
- Lcd display
- Relay
- Fan motor
- Heater
- Temperature sensor
- Heart pulse detector

PIC16F877A – This microcontroller is used to processing the input from the sensors and then givingthe corresponding output.

Fig 2-PIC16F877A

2x16lcddisplay - Will be used to visualize the data locally it will help to operate the device standalone.

Fig 3 – 2X16 LCD DISPLAY

Relay–A relay is an electrically operated switch. It consist of a set of input terminals for a single or multiple control signal,and a set of operating contact terminal.

Fig 4 -Relay

Fan motor –It consist of a synchronous or asynchronous electric motor, with a fan wheel of the associated shaft, and the connections for the lines.

Fig 5 – fan motor

Heater-A machine used for making water or air in a room,car, etc.

Fig 6 Heater

Temperature sensor –Temprature sensors measure the amount of heat energy or even coldness that is generated by an object or system.

Fig 7 Temperature sensor

Heart pulse sensor-Pulse sensor is a well designed plug-and-play heart –rate sensor through which user can take live heart rate**.**

Fig 8 – Heart pulse sensor

esp8266 wi –fi - The ESP8266 is the best decision for Internet of Things due to its minimal effort and low power utilization capacities. It accompanies inbuilt Wi Fi Module, Full TCP/IP convention stack, onboard processing, and capacity features.. It has 17 General Purpose Input Output (GPIO) pins for interfacing with outside segments and works with 3.3V

Fig 9 – ESP8266

VI. CONCLUSION

The design accounts for health and safety by providing a safe environment in which an infant is warmed. This is achieved by the use of materials that are non-toxic in the incubators range of operation. Additionally, the ability of components to be sanitized allows for the cleaning of the incubator to maintain a sterile, safe environment for the infant. Also, production of heat is directed away from the infant to ensure that heat in not directly blowing on the infant. The user is protected by the placement of heaters away from the incubator doors and the use of a protection grid over the heater fans. Our proposed system is successfully done to control the incubator radiation according to the foetus body temperature. The system supports the sending the information about incubator as well as foetus parameters to web network through IoT and we can monitor anywhere around the world.

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