

Intelligent System for Brooding Process in Poultry Farming

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ABSTRACT: Brooding is a period which is done immediately after hatching where special care and attention are given to the chicks to support their health and survival. A recently hatched chick cannot develop its own mechanism to regulate its own body temperature hence it cannot maintain its body temperature properly for the first week. Therefore the chicks will not take its required feeds and water, so this will decrease their growth and response of digestion. This project mainly aims at the brooding process in poultry farming using various parameters such as temperature, humidity, IR sensors are used. This will transfer the signals to a micro-controller and if any abnormalities occur it will be indicated through buzzer and also a message will be passed to the mobile.

KEYWORDS: Microcontroller, LCD, Triac, Temperature sensor, Humidity sensor, Infrared sensor, Buzzer.

I. INTRODUCTION

Poultry is one of the creating areas in India. It requires low capital investment and can be a secondary economical source for individuals. Presently a day's quickly expanding fuel and feed cost is a major issue for poultry farming owners. Well, being, development and least feed utilization are fundamental things for chicken. Because of conduction, convection and radiation in poultry farm huge amount of losses are created. These factors can be accomplished by keeping up a legitimate climate as chicken can't keep up their own internal heat level. Brooding is important to give artificial warmth to chickens to keep up their internal heat level with the environmental temperature.

A decent scope of advances is accessible for brooding. Be that as it may, there are various favorable circumstances disservices to each sort of brooding, poultry makers must consider numerous variables earlier to speculation, including capital costs, working expenses furthermore, execution like heat output and heat dispersion supported the wood brooders for open houses produce smoke and uneven temperature inside the house. Kerosene oil introverts generally utilized in ecological control houses are advantageous to work and products to run however very costly alongside natural risks and such introverts need to warm the quality of shed up to 49°C to warm bedding. Radiant tube heater cannot be utilized in poultry farming being costly and hard to manage.

The temperature inside the poultry house varies according to the climatic conditions. An increase in temperature causes a loss of chick growth and also harms their internal organs. The decrease in temperature makes the chick to consume more feed and lowers egg-laying qualities. An increase in humidity helps in the growth and development of microorganisms in chick and eggs. Harmful gases like carbon dioxide, ammonia can lead to unhygienic conditions, bad ventilation, and disease outbreaks

II. RELATED WORK

Brooding is generally classified as artificial brooding and natural brooding. The pre worked broodings are classified as Pot charcoal brooding, Kerosene brooding, Radiant Tube Heater brooding, and Underfloor, heater brooding.

A. POT CHARCOAL BROODING:

In this method, Pot Charcoal brooding is used as a heat supplier which is implemented in rural and remote areas. But it carries some disadvantages such as it creates smoke in high quantity which is harmful to chick health.

B. KEROSENE BROODING:

Kerosene brooding plays a major role in rural and remote areas. It needs 40 liters of kerosene in one day for approximately 1000 chicks. It creates harmful gases and harms the chicks. As the requirement of kerosene is high and their cost is also high.

C. RADIANT TUBE HEATER BROODING:

Radiant tube heater is used as a heat source. It covers more space with radiant heat. The requirement for electricity is less but the temperature varies over the tube. This leads to the discontinuous power supply and causes overheating.

D. UNDERFLOOR HEATER BROODING:

In this system, the heat is transferred through the underground electric heater and underground pipes. It depends on conduction, radiation, and convection. The disadvantage of this system is it requires external boiling and cooling system and also occupies more space

E. GAS BROODING:

LPG gas is used as a heat supplier in gas brooding. This is not a fully automated system and requires the labour force. A constant increase of prize in the LPG gas cylinder affects the rural poultry farmers.



(a) Pot Charcoal Brooder



(b) Kerosene Brooder

(c) Radiant Tube Heating



(d) Under Flow Heater

(e) Gas Brooder

Fig 1. Existing equipment's

III. PROPOSED SYSTEM

To implement an intelligent brooding process in poultry farming, a micro-controller is used along with a triac, relay, buzzer, keypad, mobile Bluetooth and different types of sensors are used

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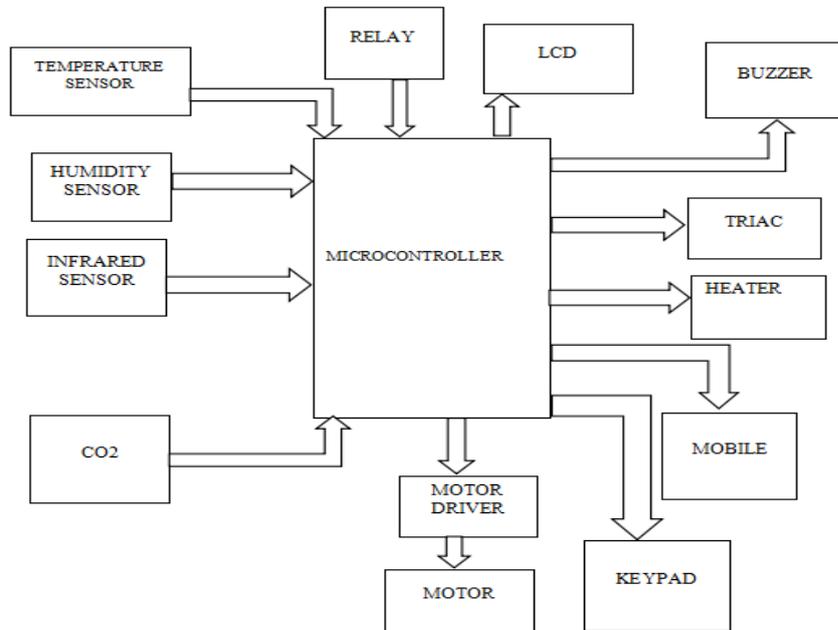


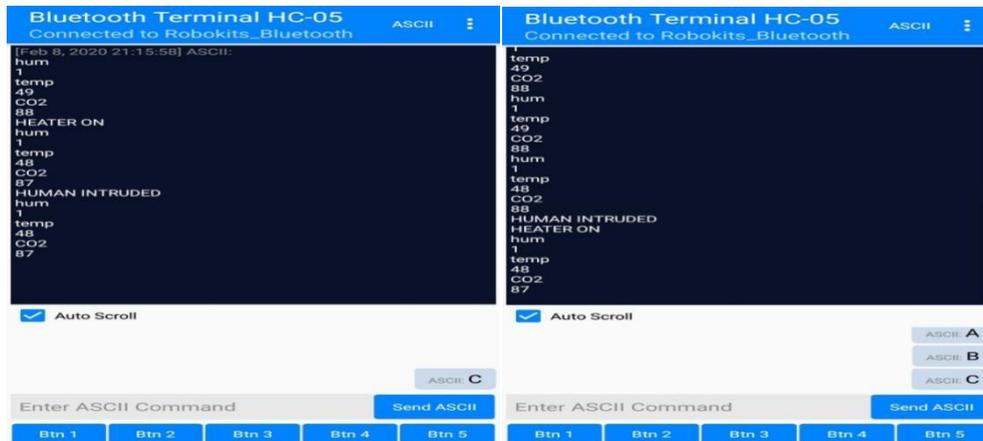
Fig.2 Block Diagram

IV. WORKING PRINCIPLE

A single microcontroller can control all other components either in a direct way or in an indirect way. Two steps down the transformer and power board are used. An equal power supply is given to all over the circuit. The temperature sensor is fixed and it senses both high and low temperatures inside the poultry house. The humidity sensor detects the moisture content inside the poultry house. An Infrared sensor is used to detect the predators. A carbon dioxide sensor is used to detect the harmful gases. A heater is fixed and controlled by a relay to supply the required level of heat throughout the house for the development of chicks generally termed as brooding. A keypad is set and connected to the heater for the continuous heat supply. A motor and motor driver is set to open and close the curtains of the poultry house. A Bluetooth module is set and all the messages are passed to the mobile application. All the components are connected to the Bluetooth module and every message is notified through the Bluetooth mobile application.

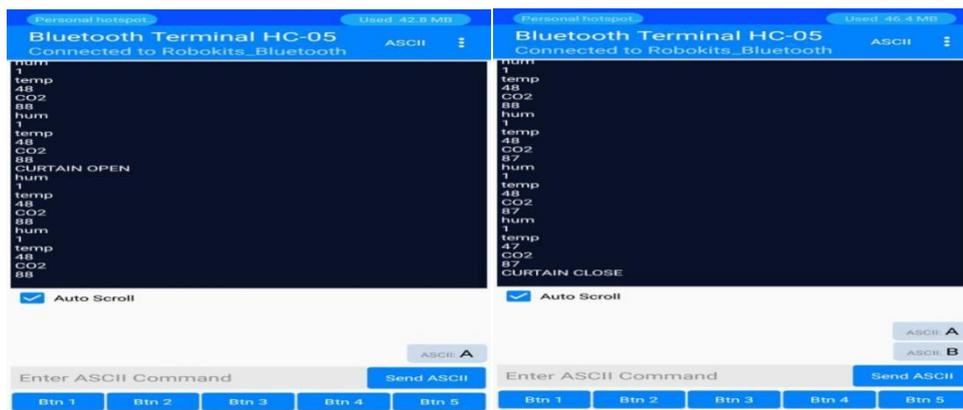
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(a)

(b)



(c)

(d)

Fig. 3 (a) Mobile Bluetooth display for heater ON (b) Mobile Bluetooth display for human interruption (c) Mobile Bluetooth display for opened curtain (d) Mobile Bluetooth display for closed curtain



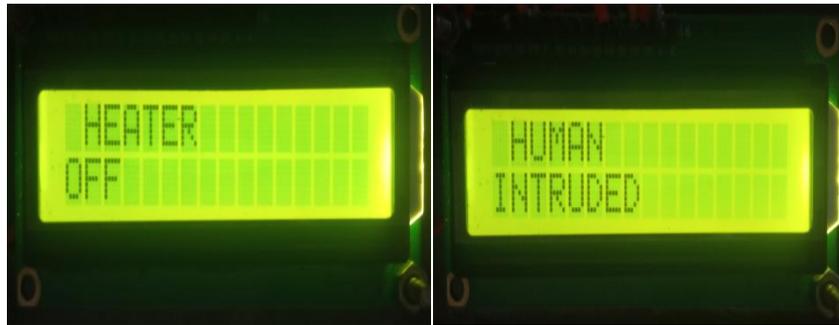
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(d)

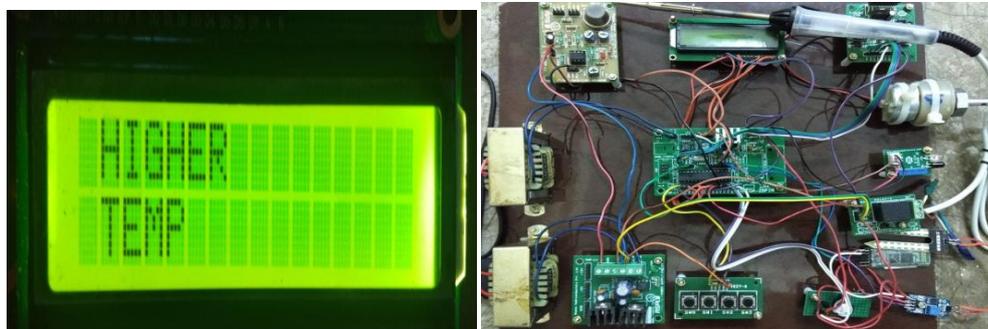
(e)

Fig. 4 (a) LCD display for opened curtain (b) LCD display for closed curtain (c) LCD display for heater on (d) LCD display for heater off (e) LCD display for human interruption



(a)

(b)



(c)

(d)

Fig. 5 (a) LCD display for high Co2 (b) LCD display for high humidity (c) LCD display for high temperature (d) Overall circuit

PARAMETERS	Co2	TEMPERATURE	HUMIDITY
Increasing Percentage	300	100	70
Operation	Motor anticlockwise	Motor clockwise	Motor anticlockwise

Table I. Parametric table

V. CONCLUSION

We have implemented an intelligent system for the brooding process in poultry farming. Our algorithm successfully detects the temperature, humidity, carbon dioxide, heat supply, and Bluetooth mobile messages. We have applied our algorithm on many images and found that it successfully detects the notification.

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