Bluetooth Control- Automatic Humidifier System.

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ABSTRACT:- A humidifier is a household equipment that adds moisture to the air in a room.
or an enclosed area. This is accomplished by discharging water droplets or steam into the air, thereby raising humidity levels. A Humidifier
A humidifier improves air quality by maintaining optimal humidity levels, reducing respiratory irritation, preventing the spread of airborne viruses, reducing static electricity, improving comfort and sleep quality, protecting wooden items, enhancing plant health, and reducing dust and allergens.
This project presents the making of an automatic humidifier system that is controllable via Bluetooth technology. Central to this system is an Arduino Uno microcontroller serving as the command center, the incorporation of Bluetooth connectivity empowers users to effortlessly manage and monitor the system using smartphones or other Bluetooth-enabled devices, ensuring unparalleled control and accessibility. Experimental validation underscores the efficacy of this integrated solution, demonstrating its ability to comprehensively enhance ambient quality and purify indoor air. Overall, this system can make the water into a vapor mist form. It helps to increase the humidity in the air.

Keywords:- Arduino Uno microcontroller, Bluetooth Module, ultrasonic humidifier mist forming spray module, fresh air.

INTRODUCTION

Humidifiers add moisture to the air to improve humidity levels.
Promotes a healthier and more comfortable living environment. These are especially useful in arid locations and during the winter months when interior air is dry due to central heating. Humidifiers can prevent dryness symptoms like dry skin, inflamed respiratory passages, and static electricity. They also help preserve wooden furnishings and musical instruments.

Evaporative humidifying devices use evaporative cooling to add moisture to the air.
In this process, water absorbs heat from the air to change from a liquid to a vapor state, thereby cooling the air. Increased humidity can affect how warm or cool an environment feels. While the actual temperature might not change significantly, higher humidity can make the air feel warmer because it hinders the body's ability to dissipate heat through sweating.

The integration of air purification functionalities into devices like the Humidifier System with Bluetooth Control represents a significant step forward. Powered by an Arduino Uno microcontroller, this system actively purifies the air, enhancing both ambiance and health. Real-time monitoring capabilities facilitated by sensors enable the system to adjust its operation dynamically, responding to changes in air quality parameters such as pollutant levels, humidity, and temperature. By proactively engaging in air quality management, the system ensures that occupants are consistently provided with a clean and comfortable indoor environment.

OBJECTIVES

The primary purpose of this observation is to create a new Bluetooth-managed automatic Humidifier with an air purification function using Arduino Uno technology. The system is designed to improve indoor air quality. User-friendliness and flexibility are prioritized in the design, making it suitable for many spaces such as rooms and cars, while mobility and versatility will also be ensured. The aim is to create a compact and space-saving product that uses minimal space, thus helping to improve the surrounding air. In addition, the system will facilitate one-click interaction, providing easy access and ease of use for users from different cultures. Finally, mobility will be important, allowing use in many places during travel, including inside the car, expanding usability, and increasing benefits.

COMPONENTS

1. Arduino Un microcontroller:-

Arduino Uno is an open-source microcontroller board based on the ATmega328P microcontroller. The

Arduino UNO is Frequently used in many different scenarios.

Our works of art range from simple LED blinking to complex robotics and automated home applications. Automation and IoT projects. The Arduino Uno can be powered via a computer's USB port or an external power supply (7-12V recommended).

The incorporated voltage regulator ensures a steady 5V working voltage. The board has been set up using the Arduino IDE (Integrated Development Environment). Users establish code in a simplified C++ and upload it via a USB cord to the device.
The Arduino IDE provides a straightforward interface with various built-in libraries for different functionalities.

2. Bluetooth Module HC-05

The HC-05 is a popular Bluetooth module that enables wireless communication between devices. It uses Bluetooth Serial Port Protocol (SPP) to make it easy to communicate with microcontrollers and other embedded devices. The HC-05 module is utilized for wireless communication in many different situations, especially at home.

The use of automation, robotics, wireless data logging, remote control, and IoT projects.
When the module is powered, it starts in command mode (if the key pin is connected to 3.3V) or in data mode (default).

3. USB Ultrasonic Humidifiers: Power Circuit Board with Atomizing Chip:

A USB ultrasonic humidifier is a small, portable device that uses ultrasonic waves to convert water into a fine mist, increasing humidity in the air. It is powered via It connects via USB, making it accessible with laptops, power banks, and USB wall adapters. Power

Power Circuit Board: Regulates and converts the USB power to the required voltage and current for the humidifier.

Atomizing Chip: A piezoelectric component that vibrates at ultrasonic frequencies to create water droplets from the reservoir. The ultrasonic humidifier works by using an atomizing chip to generate high-frequency vibrations. These vibrations break water

into tiny droplets, creating a cool mist that is expelled into the air, thereby increasing the humidity.

❖ General Block Diagram
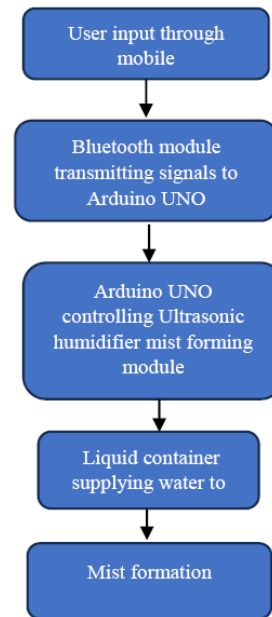
PROPOSED MODEL

The proposed Automatic Humidifier System with Bluetooth Control is a sophisticated and user-friendly device designed to enhance room ambiance through controlled humidity in the air. The system depends upon the Arduino Uno microcontroller for essential functions.

The central control unit enables efficient coordination and management of all components.
A key element of the system is the ultrasonic humidifier mist-forming spray module, which employs ultrasonic vibrations to generate a fine mist of water droplets. This innovative approach utilizes rapid vibrations to rupture the water's surface, creating a delicate mist that carries added vapor, resulting in a pleasant and refreshing atmosphere.
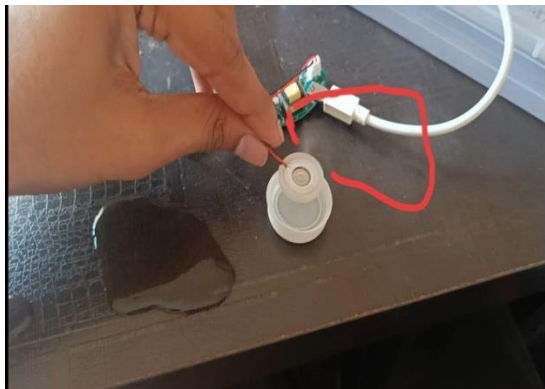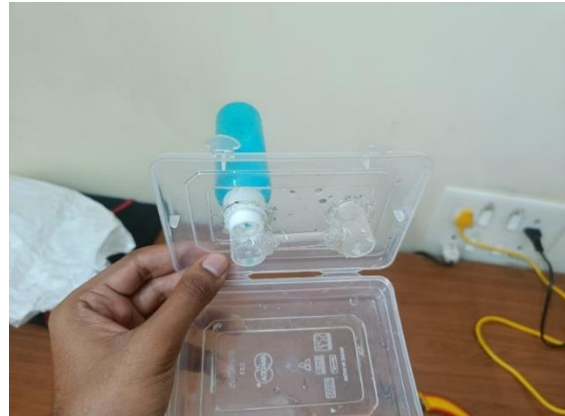
Mist formation with continues water supply –

RESULTS

The mini humidifier operates efficiently, producing a consistent mist and maintaining desired humidity levels. The humidifier can be operated wirelessly using a smartphone or other Bluetooth-enabled device after installing the HC-05 Bluetooth module. The design is compact and powered by a battery, making it portable and suitable for various small spaces. The power circuit board and atomizing chip ensure efficient power usage, contributing to the overall effectiveness of the device. The humidifier provides a pleasant user experience, being easy to operate and maintain.ss

CONCLUSION

The project successfully demonstrates the integration of microcontroller technology with ultrasonic humidification, displaying the potential for DIY electronics in practical applications. The use of Bluetooth for remote control adds a layer of convenience and modern functionality, making the device more user-friendly. The successful implementation of this project opens doors for further enhancements, such as adding sensors for automated

Humidity control or integration with smart home systems. When water droplets are atomized into the air, they absorb heat from the surroundings to
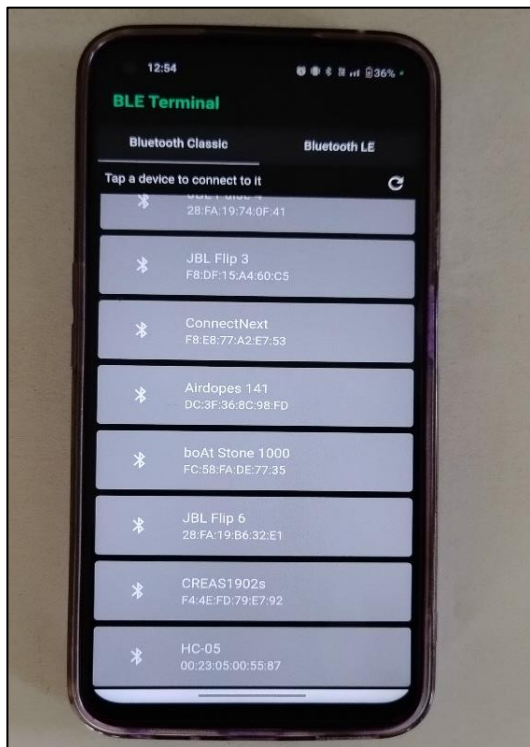
Direct Water Supply to the Mist Former –Connected a small water tank to the mist former.

evaporate, effectively cooling the air. The humidifier assists in a comfortable interior atmosphere, a vital aspect of HVAC (Heating, Ventilation, and Air Conditioning) systems.

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REFERENCES

[1] Anitha, N., et al. (2023). Air Quality Monitoring System. In Intelligent Computing and Control for Engineering and Business Systems (ICCEBS). 14 December 2023.

[2] Tanis, C., & Karakaya, K. (2021). Investigating the impacts of air quality and weather indicators on the spread of SARS-CoV-2 in Istanbul, Turkey. Thermal Science. National Library of Serbia

[3] Liu, Y., Kwan, M.-P., & Kan, Z. (2023, January 13). Inconsistent Association between Perceived Air Quality and Self-Reported Respiratory Symptoms: A Pilot Study and Implications for Environmental Health Studies. International Journal of Environmental Research and Public Health. MDPI AG.

[4] Liu, Z., Wang, G., Zhao, L. and Yang, G. (2021). Multi-points indoor air quality monitoring based on internet of things. IEEE access, 9, 70479-70492.

[5] Tanyer AM, Tavukcuoglu A, Bekboliev M. Assessing the airtightness performance of container houses in relation to its effect on energy efficiency. Build Environ. 2018; 134: 59-73.