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AUTOMATIC MISTING SYSTEM

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Abstract - The maximum crucial characteristic of the mist cooling device is that it's miles an open device and does now no longer require closed doorways and windows. The device is geared toward offering includes an open-air misting device. This device is appropriate for open airs in contrast to the conventionally used structures which can be green most effective in closed spaces. The Open-air cooling device has evaporative cooling as its simple principle. It includes simple additives like a tank to maintain the water, Nozzles which spray very excellent droplets into the air, etc. When water is sprayed into the air it's miles carried via way of means of air and receives evaporated because of warmness. This ends in a drop with inside the air temperature that's same to the latent warmness of evaporation of water and additionally will increase the humidity of air. The temperature sensor performs a crucial function because it lets in the device to paintings as according to the readings of the sensor, it senses the room/area temperature, ideally via way of means of sensors if the region is just too large, then offers the temperature cost to the device, if it's miles under 30 tiers This is designed to be too reachable to apply and set up. Also, it's miles a onetime installment so no want to fear approximately converting system or shopping for any new product.

***Key Words*: Mist, Cooling, Spray, Temperature, Humidity**

1. Introduction

In big factories and industries, in which the temperature and humidity is extraordinarily high, using A.C. could be very difficult. Also, at a few locations in which there may be big accumulating or characteristic in which too many humans are found in a unmarried room, it creates pretty a suffocating scenario for humans and worse for sufferers struggling via illnesses like asthma, pneumonia etc. Now a day, cooling gadgets generate emission that's dangerous for ozone layer and the atmosphere. Products are an excessive amount of highly-priced and now no longer each civilian can find the money for such products.

1.1 Aim

The product- Automatic Misting System, attempts to attain as many local/center elegance humans as possible. The purpose is to provide a product that's surroundings friendly, misplaced cost, clean to apply and set up and has to offer least upkeep possible. Also, the product is designed to paintings even remotely so any consumer can function the device being at unique locations. It is mainly designed for regions which covers big area and which sustains big quantity of manpower. At such spaces, air conditioners fail, so misting device is an excessive amount of possible and viable at such regions. The unique characteristic of temperature sensing of the region in which it's miles hooked up lets in to store the power while the misting isn't wanted and works accordingly.

1.2 Objective

Our Automatic Misting device now no longer most effective offers a less expensive answer however is likewise adaptable for huge/open regions. This a Automatic Misting System exams the temperature and works accordingly, putting the OFF barrier at 30 degree Celsius.

1.3 Working Principle

This Automatic Misting System now no longer most effective offers the cooling phenomenon however additionally exams the temperature of the room continuously, that is because, while the general temperature of the room/corridor decreases with the aid of using 30 degrees Celsius, the device will robotically forestall working, however as quickly because the temperature rises above 30, it once more begins off evolved working. It occupies much less space, an excessive amount of on hand to apply and carry. Much price possible than the alternative air conditioners

2. Product Detail

We have made a Misting device that's absolutely automatic the usage of Plastic pipe, Diaphragm pump, Compression fitting, Misting nodes, Arduino mega, NodeMCU, Dht11, Relay, Arduino ide, Fusion 360 etc. The Misting Nozzles are absolutely designed on software program platform. Basically, we use a water tank from in which the water is furnished to the diaphragm pump at inlet stress of 30 and outlet stress of 60 psi. When this water is going into the pipes, with the assist of stress and misting nozzles, the water receives transformed into mist form. The controlling of this device is absolutely automatic with the aid of using the usage of firebase IOT primarily based totally software program in which the information from Arduino is despatched to this on line platform and the usage of Wi-Fi, the device may be controlled. So, we will flip ON and OFF the device with the aid of using

being everywhere else too. Also, it's miles designed in Arduino that units the turning ON restrict to be above 30 degrees Celsius, as while the temperature of the room or location is much less than 30 degrees, the device receives became off robotically. And while the temperature rises above 30 degrees, it turns ON robotically. This saves the electricity fed on and the water too. The device makes a minimal distinction of approximately 4-eight degrees of temperature of an open location. That's why, that is plenty beneficial in open regions like industries and factories etc.

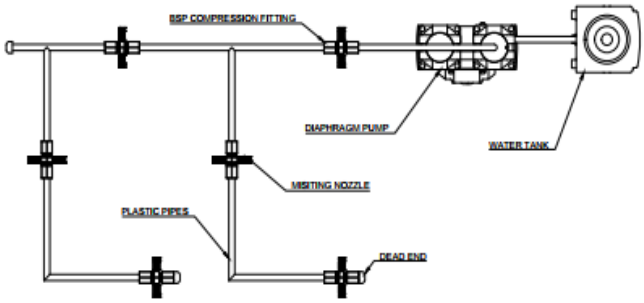

Figure 1 Design of Pipes and Nozzles

3. COMPONENTS

1. Plastic pipe

Plastic pipe is lightweight, flexible, durable, and versatile. Products are made from plastics and composite substances and are utilized in most of the identical programs as conventional steel and ceramic piping. Plastic pipe gives considerable financial savings in phrases of each weight and installation, however. Plastic piping is available in stable wall and corrugated configurations, and is to be had in a lot of not unusual.

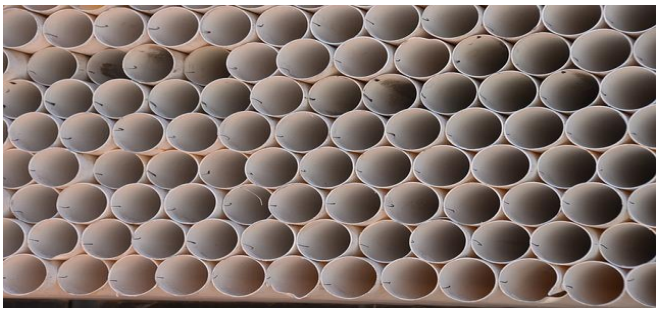

Figure 2 PVC Pipe

2. Diaphragm Pump:

A diaphragm pump (additionally referred to as a Membrane pump) is a fine displacement pump that makes use of a aggregate of the reciprocating movement of a rubber, thermoplastic or Teflon diaphragm and appropriate valves on both aspect of the diaphragm (take a look at valve, butterfly valves, flap valves, or every other shape of shut-off valves)

Figure 3 Compression Fitting

3. Compression fitting:

Compression fittings are utilized in plumbing and electric conduit structures to enroll in tubes or thin-walled pipes together. In times wherein pipes fabricated from multiple substances are to be joined (maximum usually PVC and copper), the fittings may be fabricated from one or extra like minded substances suitable for the connection.

4. Misting Nodes:

There are primary kinds of misting nozzles, impingement nozzles and impeller nozzles. Impingement nozzles permit water to go out the nozzle in a immediately circulation thru a completely small orifice (usually .008″ or approximately 200μ or microns) and without delay collide with a stable pin which correctly atomizes the water into tiny droplets, typically among 1μ and 15μ. Impingement nozzles have a tendency to be very pricey; it's miles tough to preserve the location of the stable pin and consequently tough to preserve their performance; and they're usually utilized in area of expertise applications. Impeller nozzles are the maximum not unusual place misting nozzle and that they had been used with inside the mist and fog enterprise for over 50 years. They are an awful lot much less pricey than impingement nozzles and they're greater reliable. The disadvantage of this mist nozzle layout is that it can't continually produce as exceptional a droplet as an impingement nozzle. For the widespread majority of applications, this isn't always an problem that's the number one purpose why impeller nozzles are so broadly used. A properly designed and machined impeller fashion nozzle will offer droplets starting from some microns as much as approximately 50μ with the bulk of the droplets being large than 10μ.

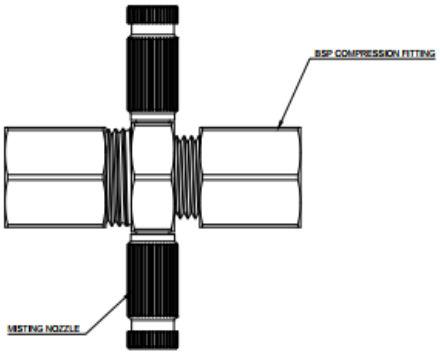

Figure 4 Misting Nodes

5. Arduino Mega:

The Arduino UNO is an open-supply microcontroller board primarily based totally at the Microchip ATmega328P microcontroller and advanced via way of means of Arduino.cc. The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE (Integrated Development Environment) through a kind B USB cable. It may be powered via way of means of a USB cable or via way of means of an outside 9-volt battery, aleven though it accepts voltages among 7 and 20 volts. It is likewise much like the Arduino Nano and Leonardo. The hardware reference layout is sent below a Creative Commons Attribution Share-Alike 2.five license and is to be had at the Arduino website. Layout and manufacturing documents for a few variations of the hardware also are to be had. "Uno" method one in Italian and became selected to mark the discharge of Arduino Software (IDE) 1.zero. The Uno board and model 1.zero of Arduino Software (IDE) had been the reference variations of Arduino, now advanced to more recent releases. The Uno board is the primary in a chain of USB Arduino forums, and the reference version for the Arduino platform. The ATmega328 at the Arduino Uno comes preprogrammed with a bootloader that permits importing new code to it with out using an outside hardware programmer It communicates the usage of the authentic STK500 protocol. The Uno additionally differs from all previous forums in that it does now no longer use the FTDI USB-to-serial motive force chip. Instead, it makes use of the Atmega16U2 (Atmega8U2 as much as model R2) programmed as a USB-to-serial converter.

6. NodeMCU

NodeMCU is an open supply IoT platform. It consists of firmware which runs at the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware that is primarily based totally at the ESP-12 module. The term "NodeMCU" through default refers back to the firmware as opposed to the improvement kits. The firmware makes use of the Lua scripting language. It is primarily based totally at the eLua project, and constructed at the Espressif Non-OS SDK for ESP8266. It makes use of many open-supply projects, inclusive of Lua-CJSON and SPIFFS.

7. DHT11

This DHT11 Temperature & Humidity Sensor functions a temperature & humidity sensor complicated with a calibrated virtual sign output. By the use of the one-of-a-kind virtual-sign-acquisition method and temperature & humidity sensing technology, it guarantees excessive reliability and extremely good long-time period stability. This sensor consists of a resistive-kind humidity size issue and an NTC temperature size issue, and connects to a excessive- overall performance 8-bit microcontroller, providing extremely good quality, rapid response, anti-interference cap potential and cost-effectiveness.

Figure 5 Temperature and Humidity Sensor

8. Relay

A relay is an electrically operated switch. Many relays use an electromagnet to routinely perform a switch, however different working ideas also are used, consisting of solid-country relays. Relays are used wherein it's far important to manipulate a circuit with the aid of using a separate low-energy sign, or wherein numerous circuits ought to be managed with the aid of using one sign. The first relays have been utilized in lengthy distance telegraph circuits as amplifiers: they repeated the sign coming in from one circuit and re-transmitted it on every other circuit. Relays have been used substantially in phone exchanges and early computer systems to carry out logical operations.

4. CONCLUSION

This Automatic Misting System not only provides the cooling phenomenon but also checks the temperature of the room continuously, this is because, when the overall temperature of the room/hall decreases by 30 degree Celsius, the system will automatically stop working, but as soon as the temperature rises above 30, it again starts working. It occupies less space, too much handy to use and carry. It is much cost feasible than the other air conditioners.

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BIOGRAPHIES

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