FORM 2

THE PATENTS ACT, 1970

(39 of 1970)

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The Patent Rules, 2003

COMPLETE SPECIFICATION

(See sections 10 & rule 13)

1. TITLE OF THE INVENTION

TEMPERTAURE CONTROLLED FAN SYSTEM

2. APPLICANT (S)

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3. PREAMBLE TO THE DESCRIPTION

COMPLETE SPECIFICATION

The following specification particularly describes the invention and the manner in which it is to be performed.

TECHNICAL FIELD

[0001] The present disclosure relates generally to the field of control of cooling fans and more specifically relates to a temperature controlled fan system that controls speed of the fan based on temperature variations of the surrounding.

BACKGROUND

[0002] Background description includes information that may be useful in understanding the present disclosure. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed disclosure, or that any publication specifically or implicitly referenced is prior art.

[0003] Indoor temperature regulation has long been a vital aspect of ensuring comfort and energy efficiency in residential and commercial spaces. Traditional thermostats and climate control systems have served as the foundation for maintaining desired temperatures by controlling heating, ventilation, and air conditioning (HVAC) systems. These systems, however, often operate on predefined temperature setpoints and lack the fine granularity needed for optimizing fan speed based on real-time temperature fluctuations. This limitation can lead to less precise temperature control and potential energy inefficiencies.

[0004] The advent of smart thermostats marked a significant step forward in temperature regulation technology. These devices leverage connectivity and data analysis, allowing users to program and control them remotely through mobile apps. Some smart thermostats even adapt to user preferences and occupancy patterns, enhancing user comfort and energy savings. However, their primary focus remains on HVAC systems, and they might not offer comprehensive control over individual fan speeds, which can be crucial for precise temperature regulation.

[0005] As the Internet of Things (IoT) gained prominence, climate control systems saw a new wave of innovation. IoT-based systems integrate various sensors, including temperature sensors, humidity sensors, and occupancy detectors, to optimize comfort and energy efficiency. While these systems offer advanced automation and intelligence, individual fan speed control is not always a central feature. Moreover, achieving the right balance between user comfort and energy

conservation can be complex, leading to challenges in energy efficiency.

[0006] Existing climate control systems often rely on predefined setpoints, limiting their responsiveness to rapid temperature changes or localized temperature variations. Moreover, some solutions require manual user intervention for adjustments or scheduling, which can be inconvenient and limit user engagement. Additionally, the implementation of complex climate control solutions, especially IoT-based systems with multiple sensors and connectivity infrastructure, can entail high initial costs.

[0007] There is, therefore, a need to overcome the above drawback, limitations, and shortcomings associated with the existing techniques, and provide a solution for effectively controlling speed of the fan based on temperature variations of the surrounding.

OBJECTS OF THE PRESENT DISCLOSURE

[0008] Some of the objects of the present disclosure, which at least one embodiment herein satisfies are as listed herein below.

[0009] An object of the present disclosure is to provide a temperature controlled fan system to efficiently regulate room temperature by dynamically adjusting the speed of a cooling fan based on real-time room temperature data.

[0010] An object of the present disclosure is to provide a temperature controlled fan system that ensures reliable and accurate transmission of room temperature data for precise control of the cooling fan's speed.

[0011] An object of the present disclosure is to provide a temperature controlled fan system with a cold threshold protection feature to automatically deactivate the cooling fan when the room temperature falls below a predefined threshold, preventing overcooling and ensuring user comfort.

[0012] An object of the present disclosure is to provide a temperature controlled fan system that adjusts the speed of the cooling fan in direct proportion to changes in the sensed room temperature, ensuring rapid and accurate response to temperature fluctuations.

SUMMARY

[0013] Various aspects of present disclosure relate to the field of control of cooling fans and more specifically relates to a temperature controlled fan system that controls speed of the fan based on temperature variations of the surrounding.

[0014] According to an aspect of the present disclosure a temperature controlled fan system is disclosed that includes a cooling fan, a temperature sensor, a switch and a processor. The cooling fan may be configured to be controlled for temperature regulation, the temperature sensor may be configured to sense a set of room temperature data for an area and the switch may be configured to regulate the electrical current flowing through the cooling fan. The processor may be configured to receive the set of room temperature data from the temperature sensor through a wired communication protocol, process the received set of temperature data to calculate an optimal speed of the cooling fan and alter the voltage supplied to the cooling fan through the switch to adjust the speed of the cooling fan for regulating temperature.

[0015] In an aspect, the system may include a display for displaying real-time room temperature data and the current speed of the cooling fan.

[0016] In an aspect, the processor may be further configured to utilize a predefined algorithm to calculate the optimal speed of the cooling fan based on the received set of room temperature data.

[0017] In an aspect, the processor may be further configured to automatically turn off the cooling fan when the room temperature falls below a predefined cold threshold.

[0018] Various objects, features, aspects, and advantages of the inventive subject matter will become more apparent from the following detailed description of preferred embodiments, along with the accompanying drawing figures in which like numerals represent like components.

BRIEF DESCRIPTION OF DRAWINGS

[0019] The accompanying drawings are included to provide a further understanding of the present disclosure, and are incorporated in, and constitute a

part of this specification. The drawings illustrate exemplary embodiments of the present disclosure, and together with the description, serve to explain the principles of the present disclosure.

[0020] In the figures, similar components, and/or features may have the same reference label. Further, various components of the same type may be distinguished by following the reference label with a second label that distinguishes among the similar components. If only the first reference label is used in the specification, the description is applicable to any one of the similar components having the same first reference label irrespective of the second reference label.

[0021] FIG. 1 illustrates an exemplary block diagram of the proposed temperature controlled fan system, in accordance with an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0022] The following is a detailed description of embodiments of the disclosure depicted in the accompanying drawings. The embodiments are in such detail as to clearly communicate the disclosure. However, the amount of detail offered is not intended to limit the anticipated variations of embodiments. On the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit, and scope of the present disclosure as defined by the appended claims.

[0023] In the following description, numerous specific details are set forth in order to provide a thorough understanding of embodiments of the present invention. It will be apparent to one skilled in the art that embodiments of the present invention may be practiced without some of these specific details. Embodiments of this disclosure relates generally to the field of control of cooling fans and more specifically relates to a temperature controlled fan system that controls speed of the fan based on temperature variations of the surrounding.

[0024] If the specification states a component or feature “may”, “can”, “could”, or “might” be included or have a characteristic, that particular component or feature is not required to be included or have the characteristic.

[0025] As used in the description herein and throughout the claims that follow, the meaning of “a,” “an,” and “the” includes plural reference unless the context clearly dictates otherwise. Also, as used in the description herein, the meaning of “in” includes “in” and “on” unless the context clearly dictates otherwise.

[0026] According to an embodiment of the present disclosure a temperature controlled fan system is disclosed that includes a cooling fan, a temperature sensor, a switch and a processor. The cooling fan may be configured to be controlled for temperature regulation, the temperature sensor may be configured to sense a set of room temperature data for an area and the switch may be configured to regulate the electrical current flowing through the cooling fan. The processor may be configured to receive the set of room temperature data from the temperature sensor through a wired communication protocol, process the received set of temperature data to calculate an optimal speed of the cooling fan and alter the voltage supplied to the cooling fan through the switch to adjust the speed of the cooling fan for regulating temperature.

[0027] In an embodiment, the system may include a display for displaying real-time room temperature data and the current speed of the cooling fan.

[0028] In an embodiment, the processor may be further configured to utilize a predefined algorithm to calculate the optimal speed of the cooling fan based on the received set of room temperature data.

[0029] In an embodiment, the processor may be further configured to automatically turn off the cooling fan when the room temperature falls below a predefined cold threshold.

[0030] FIG. 1 illustrates an exemplary block diagram of the proposed temperature controlled fan system, in accordance with an embodiment of the present disclosure.

[0031] Referring to FIG. 1, a temperature controlled fan system 100 (hereinafter referred as system 100). The system 100 may include a cooling fan 102 configured to be controlled for temperature regulation, a temperature sensor 104 configured to sense a set of room temperature data for an area and a switch 106

configured to regulate the electrical current flowing through the cooling fan 102. The system 100 may include receive the set of room temperature data from the temperature sensor 104 through a wired communication protocol 110, process the received set of temperature data to calculate an optimal speed of the cooling fan 102 and alter the voltage supplied to the cooling fan 102 through the switch 106 to adjust the speed of the cooling fan 102 for regulating temperature.

[0032] In an exemplary embodiment, a temperature sensor 104 may be a thermocouple, thermistors, that can include, but is not limited, to any or a combination of the one or more temperature sensors known in the art.

[0033] In an embodiment, the processor 108 may utilize a predefined algorithm to calculate the optimal speed of the cooling fan 102 based on the received set of room temperature data.

[0034] In an embodiment, the processor 102 may be further configured to automatically turn off the cooling fan 102 when the room temperature falls below a predefined cold threshold.

[0035] In an embodiment, the processor 108 may be configured to adjust the speed of the cooling fan 102 in proportion to changes in the sensed room temperature.

[0036] In an embodiment, the processor 102 includes suitable logic, circuitry, and/or interfaces that are operable to execute one or more instructions to perform pre-determined operations. The processor 102 may be implemented using one or more processor technologies known in the art. Examples of the processor 102 include but are not limited to, a microcontroller, microprocessor, integrated microcircuit, integration chip, or any other processor.

[0037] In an embodiment, the system may include a display 112 for displaying real-time room temperature data and the current speed of the cooling fan 102.

[0038] In an embodiment, the display 112 may provide one or more users 114 with real-time feedback about the operation of the system 100.

[0039] The display 112 may include one or more computing devices. The computing devices may be smartphone, tablet computer, personal digital assistant,

laptop, portable media device, or the like. Moreover, the computing devices 110 may include any web client or application that facilitates communication and interaction. The computing device 110 may also provide a communication pathway for one or more components of the system 100.

[0040] In an embodiment, the one or more users 114 may interact with the system 100 to monitor and adjust speed of cooling fan 102 and temperature settings.

[0041] In an embodiment, the switch 106 may be a MOSFET configured to vary the voltage supplied to the cooling fan 102 in order to adjust the speed of the cooling fan 102.

Exemplary Scenario

[0042] In an exemplary embodiment, the MOSFET may be a IRF540N MOSFET.

[0043] In an exemplary embodiment, the temperature sensor may be DS18B20 Temperature Sensor.

[0044] Example 1 - Room Heating: Room temperature is 20°C, the algorithm may determine that the fan speed should be set at a low speed to maintain comfort and the processor (microcontroller unit) adjusts the MOSFET to provide low voltage to the fan, keeping it running at a low speed.

[0045] Example 2 - Room Cooling: Room temperature is 28°C, the algorithm calculates that the fan speed needs to increase for efficient cooling and the processor (microcontroller unit) increases the voltage supplied through the MOSFET, causing the fan to run at a higher speed.

[0046] Example 3 - Cold Threshold Protection: Room temperature drops to 10°C, the system's cold threshold is set at 15°C, the processor (microcontroller unit) detects that the temperature is below the threshold and the MOSFET is turned off, completely stopping the fan to prevent overcooling.

[0047] Above embodiments disclose a temperature controlled fan system that controls speed of the fan based on temperature variations of the surrounding. The system may include a cooling fan, a temperature sensor, a switch and a processor. The cooling fan may be configured to be controlled for temperature regulation, the temperature sensor may sense a set of room temperature data for an

area and the switch may regulate the electrical current flowing through the cooling fan. The processor may receive the set of room temperature data from the temperature sensor through a wired communication protocol, process the received set of temperature data to calculate an optimal speed of the cooling fan and alter the voltage supplied to the cooling fan through the switch to adjust the speed of the cooling fan for regulating temperature.

[0048] Moreover, in interpreting the specification, all terms should be interpreted in the broadest possible manner consistent with the context. In particular, the terms “comprises” and “comprising” should be interpreted as referring to elements, components, or steps in a non-exclusive manner, indicating that the referenced elements, components, or steps may be present, or utilized, or combined with other elements, components, or steps that are not expressly referenced. Where the specification claims refer to at least one of something selected from the group consisting of A, B, C….and N, the text should be interpreted as requiring only one element from the group, not A plus N, or B plus N, etc.

[0049] While the foregoing describes various embodiments of the invention, other and further embodiments of the invention may be devised without departing from the basic scope thereof. The scope of the invention is determined by the claims that follow. The invention is not limited to the described embodiments, versions or examples, which are comprised to enable a person having ordinary skill in the art to make and use the invention when combined with information and knowledge available to those having ordinary skill in the art.

ADVANATGES OF THE INVENTION

[0050] The present disclosure provides a temperature controlled fan system that dynamically adjusts the fan speed based on real-time temperature measurements to achieve efficient temperature regulation and user comfort.

[0051] The present disclosure provides a temperature controlled fan system that automatically switches off the fan when the temperature drops below a predefined cold threshold to prevent excessive cooling.

[0052] The present disclosure provides a temperature controlled fan system with a visual feedback interface for users to monitor real-time temperature and fan speed information.

[0053] The present disclosure provides a temperature controlled fan system with seamless automation of the fan speed control process without requiring manual intervention from users.

[0054] The present disclosure provides a temperature controlled fan system with a switch vary the voltage supplied to the fan, thereby adjusting the fan's rotational speed.

[0055] The present disclosure provides a temperature controlled fan system with a predefined algorithm to determine the appropriate fan speed based on temperature data.

We Claim:

1. A temperature controlled fan system (100), said system (100) comprising:

a cooling fan (102) configured to be controlled for temperature regulation;

a temperature sensor (104) configured to sense a set of room temperature data for an area;

a switch (106) configured to regulate the electrical current flowing through the cooling fan (102);

a processor (108) to execute a set of instructions, wherein said set of instructions comprising:

receive the set of room temperature data from the temperature sensor (104) through a wired communication protocol (110);

process the received set of temperature data to calculate an optimal speed of the cooling fan (102); and

alter the voltage supplied to the cooling fan (102) through the switch (106) to adjust the speed of the cooling fan (102) for regulating temperature.

2. The system (100) as claimed in claim 1, wherein the system (100) further comprises a display (112) for displaying real-time room temperature data and the current speed of the cooling fan (102).

3. The system (100) as claimed in claim 1, wherein the processor (108) utilizes a predefined algorithm to calculate the optimal speed of the cooling fan (102) based on the received set of room temperature data.

4. The system (100) as claimed in claim 1, wherein the processor (108) is further configured to automatically turn off the cooling fan (102) when the room temperature falls below a predefined cold threshold.

5. The system (100) as claimed in claim 1, wherein the switch (106) is a MOSFET configured to vary the voltage supplied to the cooling fan (102) in order to adjust the speed of the cooling fan (102).

6. The system (100) as claimed in claim 1, wherein the display (112) provides one or more users (114) with real-time feedback about the operation of the system (100).

7. The system (100) as claimed in claim 1, wherein the processor (108) is configured to adjust the speed of the cooling fan (102) in proportion to changes in the sensed room temperature.

8. The system (100) as claimed in claim 1, wherein the one or more users (114) can interact with the display (112) to monitor and adjust speed of cooling fan (102) and temperature settings.

For Panipat Institute of Engineering and Technology

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Dated: 21st September, 2023

ABSTRACT

TEMPERTAURE CONTROLLED FAN SYSTEM

A temperature controlled fan system is disclosed. The system comprises a cooling fan (102) controlled for temperature regulation, a temperature sensor (104) to sense a set of room temperature data for an area, a switch (106) to regulate the electrical current flowing through the cooling fan (102) and a processor (108) to receive the set of room temperature data from the temperature sensor (104) through a wired communication protocol (110), process the received set of temperature data to calculate an optimal speed of the cooling fan (102) and alter the voltage supplied to the cooling fan (102) through the switch (106) to adjust the speed of the cooling fan (102) for regulating temperature.

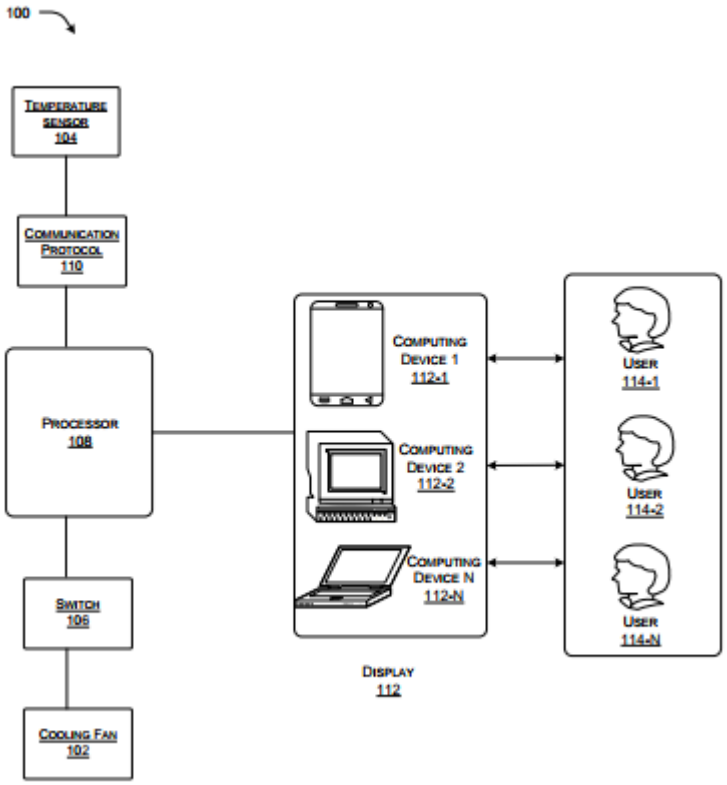

FIG. 1