ExEEd- PROTOTYPE DESIGN

Title of Idea:Auto Exhaust E-Fan

Problem Definition

- A lot of inconvenience like heavy sound is experienced when exhaust fan is working continuously in hotels,houses etc.

- The continuous operation of Exhaust fan can cause a lot of wear and tear to fan while running, and people might get disturbance since the fan produces huge gigantic sound.

- This is a very prevalent issue and has a huge impact on both the customers(in the form of sound) in cafeteria and management(in the form of sound and electricity bill) too.

Aim & Objective

- To design a Auto exhaust E-Fan by monitoring with Arduino.

- To alleviate the inconveniences experienced due to the continuous running of exhaust fans.

- To implement an electronic fan with temperature sensing and speed control.

- To integrate electronic components like Arduino Board, temperature sensor, fan, transistor ,capacitor etc which makes the whole insfrastructure.

Proposed System

- **E-Fan,which is created to overcome the major drawbacks of all traditional exhaust fans present in hotels,cafeteria etc.**
- **It may be similar to the exhaust fan which are in use at present.**
- **But then it also differs in many ways.The main difference when compared to traditional exhaust fan is the automation which enables the fan to rotate automatically whenever the temperature increases greater than room temperature.**
- **The operation of this Auto Exhaust E-Fan is so simple as it has automation feature which enables it to work according to temperature.**

Traditional System

- The traditional exhaust fan when we see ,a lot of inconvenience like heavy sound is experienced when exhaust fan is working continuously in hotels,houses etc.
- The continuous operation of Exhaust fan can cause a lot of wear and tear to fan while running, and people might get disturbance since the fan produces huge gigantic sound
- This is a very prevalent issue and has a huge impact on both the customers(in the form of sound) in cafeteria and management(in the form of sound and electricity bill) too.

Implemented Features

- The most unique features of this implementation would be the ability to reduce both noise and electricity consumption as the fan turns on automatically when the temperature in the room tends to raise.

- The acceptance of the Arduino board would spare total functioning of prototype.

- This prototype helps to save electricity bill very efficiently and thereby reduces noise.

Basic components

1)Arduino board:The board has regular innovation and a bug fix in the design of the board to make the board suitable for copying the code from computer to it.

2) LM35 Temperature Sensor:The LM35 is one kind of commonly used temperature sensor that can be used to measure temperature (in °C).

3) 12V DC Fan:This 12v DC Fan is used to check when the fan is functioning according to the temperature.

4) 16x2 LCD Display:This LCD display is used to display temperature in (in °C) and percentage of speed of fan.

5) Potentiometer 10K: It is used to change the electrical parameters of a system, a single turn Potentiometer with a rotating knob.

6) Transistor 2N2222: It is used for general purpose low-power amplifying or switching applications,also used for low to medium current, low power, medium voltage, and can operate at moderately high speeds.

7) Resistor 1K:It is used to control the fan speed .

8) Diode 1N4007: It is used to convert AC voltage to DC voltage with other filter capacitor.

9) Capacitor 10uF:The capacitor which has a long life, low leakage current used for wide operating range.

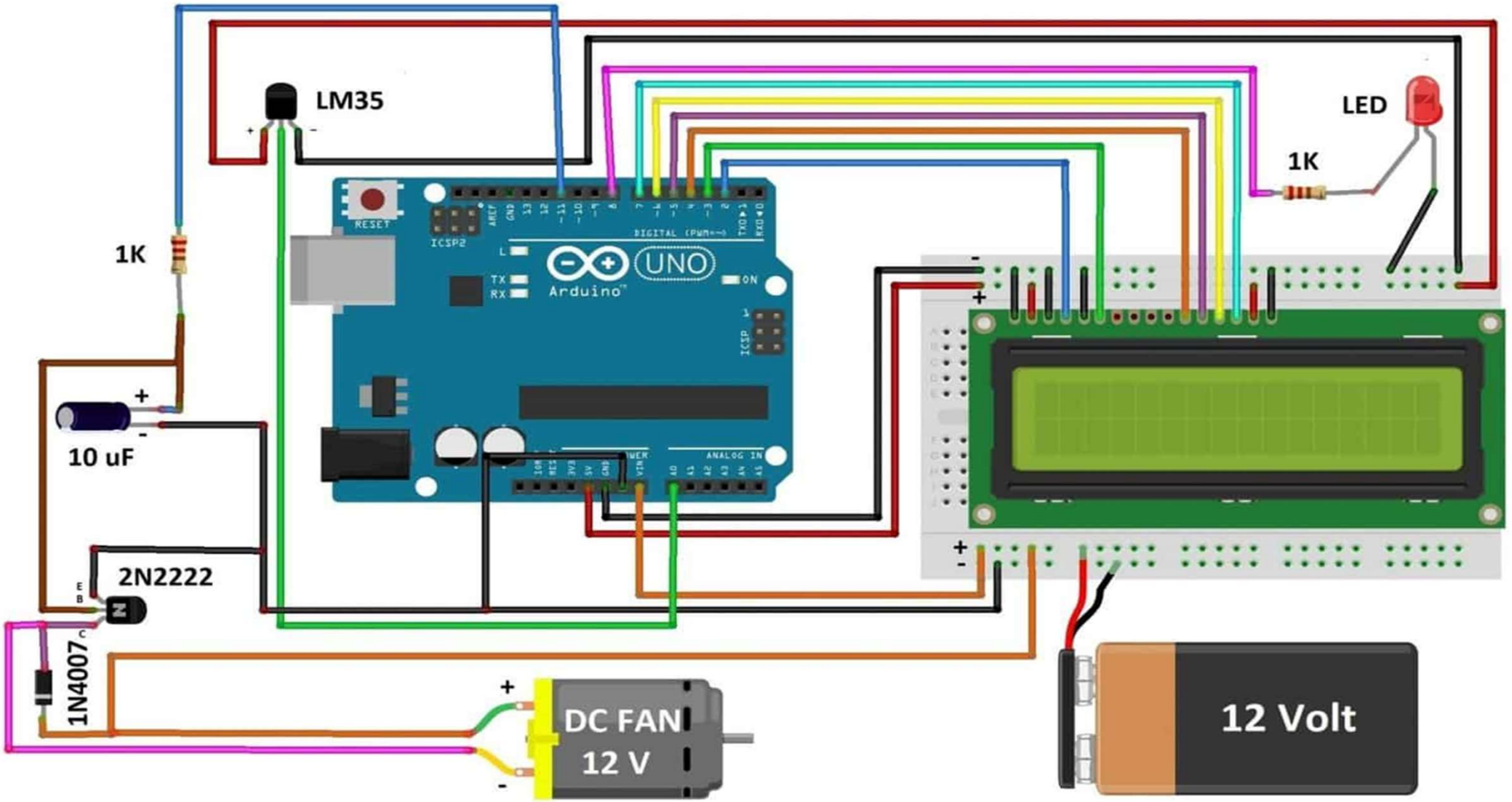
10) LED 5mm:It is used in this circuit for indicator for current flow.

12) 12V Power Supply/Adapter: It is used to switch the power supply for the functioning of circuit made.

13) Connecting/jumper Wires:It is used connect the modules like Arduino,LCD display,breadboard etc.

14) Breadboard/Plug block:It is used for building required circuit.

Circuit diagram



Background of Idea (Potential Markets)

- The potential market for the idea would be India consumer Electronics Market.

- This idea can be adapted by many developing countries to solve similar issues faced by rotating machineries.

Technical Feasibility

- **The system will be built using the following components:**

1)Arduino for the whole functioning of the electronic circuit.

2)Temperature sensor for sensing the temperature.

3)Transistor for the power amplification of whole circuit.

4)Potentiometer for changing electrical parameters of the system

Software and Hardware requirements

SOFTWARE REQUIREMENTS

- ✓ **Arduino IDE(software) for copying the program from system to Arduino board.**

RECOMMENDED OS:

1)Windows 11 or higher

Business Model canvas

How E-fan works?

Key activities:

1)Automation and temperature sensing.

2)Seasonal promotion and advertising.

Key partners:

1)Active users

2)Influencers

Key resources:

1)Easy to use

2)Large no of users.

Customer segments:

1)People in hotels,cafeteria who wants to minimize electricity bill and sound can use

2)People who are fond of automated electronic fans.

Channels:

1)Advertisements

2)Online stores

Customer relationship:

1)Advertising

2)Feedback collection

Revenue streams:

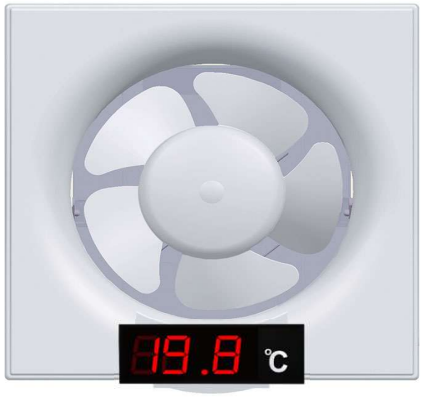
1)Commision

2)Advertising

3)Affiliate income

Design & Drawings of Prototype (Rough Sketches)

a)Traditional exhaust fan



b)Proposed auto exhaust e-fan

BUDGET EVALUATION

1)Arduino Board-RS 800

2)Breadboard-RS 120

3)9v Battery-RS 25

4)Transistor(2N2222)-RS 15

5)Resistor(1K)-RS 15

6)Connecting wires-RS 60

7)DC Fan(12V)-RS 160

8)Potentiometer(10K)-RS 400

9)Arduino cable-RS 110

9)LCD Display-RS 250

10)Temp sensor-RS 80

SUB TOTAL:RS 2,040

Conclusion

- Severe inconveniences regarding noise and excess of electricity consumption experienced by thousands of hotels,customers in each state everyday.

- A majority of this can be alleviated by implementing automated Electronic fan using Arduino.

- This solution can bring about change and rid of hassle each day.


Thank you