

PATENT APPLICATION

Title of the Invention:

Automatic Rain Detector and Cloth Collecting Working Model

Applicant(s):

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Field of the Invention:

This invention belongs to the field of automation and smart home technologies. More specifically, it relates to an automatic rain detection system combined with a mechanical cloth collecting unit. The invention aims to safeguard clothes that are dried outdoors from getting wet due to sudden, unpredicted rainfall. The system is intended to be a reliable, intelligent solution that requires minimal human effort and can be installed in residential and institutional buildings.

Background of the Invention:

Clothes drying outdoors is a common practice, especially in households without electric dryers or with a preference for natural sunlight. However, unpredictable weather conditions often lead to sudden rainfalls, especially during monsoon seasons. This results in inconvenience, extra laundry work, and even fabric damage.

In most cases, the user must constantly monitor weather changes to ensure clothes are safe. This manual process is time-consuming and impractical in today's fast-paced lifestyle. While some semi-automatic cloth hangers exist, they often do not respond to environmental changes like rain.

Thus, the need arises for an automated mechanism that not only detects rain but also responds instantly by collecting or retracting the clothes into a covered or enclosed area, ensuring that they remain dry and undamaged.

Summary of the Invention:

This invention offers a fully automatic rain detection and cloth collecting system that operates without user intervention. It consists of a rain sensor, microcontroller, electric motor, mechanical track or pulley system, and a protective frame. The clothes are suspended on a movable rod or rail, which can be pulled back into a roofed or enclosed area upon rain detection.

The system functions in the following way:

1. The rain sensor detects the presence of rain droplets.
2. This sensor sends an electronic signal to the microcontroller.
3. The microcontroller processes the signal and activates a DC motor or stepper motor.
4. The motor drives a pulley or rail-based system that pulls the cloth hanger rod inside the covered zone.
5. When the rain stops, the system can reset or alert the user to move clothes back outside.

Brief Description of the Drawings:

Figures to be attached separately – suggested diagrams include:

1. Block diagram of the system.
2. Wiring schematic including rain sensor, Arduino, motor driver.
3. Mechanical layout of the rail/pulley mechanism.
4. Side view of the clothes movement from open to shelter position.

Detailed Description of the Invention:

1. Rain Sensor: Uses water conductivity or infrared technology to detect moisture or raindrops. When water is present, the resistance changes, triggering a signal.
2. Microcontroller (e.g., Arduino Uno or 8051): Acts as the central control unit. It reads data from the rain sensor and decides when to activate or deactivate the motor. The logic is programmed using embedded C or Arduino IDE.
3. Motor Mechanism: A DC motor or servo motor is connected to a pulley or track. The motor is powered by a 12V source and uses motor driver ICs like L298N. The motor rotates in a specific direction to pull the hanger inside.
4. Rail/Pulley System: A lightweight aluminum or plastic rail allows the cloth rod to move smoothly. Nylon ropes or belts can be used to assist the movement in pulley-type designs.
5. Shelter Frame: Made from waterproof materials like polycarbonate or coated metal. This area is where the clothes are pulled during rain.
6. Power Supply: Runs on a standard DC adapter or battery. Optionally, solar panels can be added to improve sustainability.

Optional Features:

- Mobile app alert via Wi-Fi or Bluetooth module.
- LCD screen for system status.
- Manual override button for user control.

Advantages of the Invention:

- Automatic and hands-free operation.
- Responds instantly to rainfall and avoids damage to clothes.
- Reduces the need for checking the weather frequently.

- Can be operated on renewable energy sources.
- Can be installed in homes, schools, hostels, and apartment buildings.
- Customizable for different spaces.
- Built with weather-resistant materials.

Claims:

1. An automated system for detecting rainfall and retracting clothes drying rods into a covered area.
2. The system includes a rain sensor, programmable microcontroller, electric motor, and track/pulley mechanism.
3. The system operates automatically upon rain detection without manual input.
4. A reset or notification feature is provided after rainfall ends.
5. The system is compatible with solar power or battery-based operation for eco-friendly performance.

Abstract:

This patent describes an innovative, automatic system designed to protect outdoor-dried clothes from sudden rain. The invention features a rain detection module connected to a smart microcontroller that controls a motorized mechanism. This mechanism swiftly moves the drying rod or hanger into a covered space, preventing the clothes from getting wet. The invention is practical, efficient, and ideal for homes, hostels, and apartments where manual collection of clothes is often difficult. It enhances convenience while promoting sustainable technology in day-to-day living.

Diagram:

The following figure illustrates the system design of the Automatic Rain Detector and Cloth Collecting Model:

