



METHOD AND APPARATUS FOR SCANNING AND ESTIMATING MOISTURE IN SOIL

IITM Technology Available for Licensing

Problem Statement

- Current systems lack adequate sensor deployment in soil, leading to inaccuracies in estimating soil moisture and subsequent irrigation scheduling.
- **Balancing the number of sensors needed for accuracy with the associated costs presents a challenge**, especially regarding sensor safety and maintenance expenses.
- Existing methods requiring sensors to directly contact the soil hinder deployment and maintenance, impacting day-to-day farming activities.
- Furthermore, **utilizing satellites and UAVs for soil moisture estimation is costly** and limited by the number of connections needed for irrigation control, as well as infrequent measurements, affecting precision in irrigation timing and location.

Intellectual Property

- IITM IDF Ref. 1371
- **IN 367385 - Patent Granted**
- **PCT/IN2017/050061**

Technology Category/ Market

Category - Precision Agriculture

Applications - Precision Irrigation Management

Industry - Smart Farming and IoT Solutions Providers

Market - Global soil monitoring market is estimated to be USD 551 million in 2022 and projected to reach USD 1,088 million by 2027, at a CAGR of 14.6%.

TRL (Technology Readiness Level)

TRL - 3, Proof of concept stage.

Technology

The present invention relates to estimating soil moisture and more particularly to an apparatus and a method for scanning and estimating moisture in soil.

1

- **The apparatus introduces a unique design featuring a reflector system to filter out irrelevant signals, ensuring accurate moisture estimation in soil without direct contact, enhancing efficiency and reducing processing time.**

2

- **It enables remote observation and control through wireless networking, facilitating cloud computing for efficient irrigation scheduling and scalability, thereby improving agricultural yield while minimizing manual intervention.**

3

- **The apparatus includes a water flow controller with various valves for precise water supply management based on real-time weather data, optimizing irrigation schedules and conserving water resources, thus addressing sustainability concerns in agriculture.**

Research Lab

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Key Features / Value Proposition

- **Innovative Moisture Estimation:**

Cutting-edge technology enables accurate soil moisture estimation without physical contact, enhancing agricultural productivity.

- **Remote Monitoring and Control:**

Wireless connectivity allows real-time observation and management of irrigation systems, optimizing water usage and minimizing manual labor.

- **Cost-Efficient Solution:**

Reduced processing time and improved efficiency translate to lower operational costs, offering a compelling value proposition for farmers.

- **Scalable Irrigation Management:**

Cloud-based computing enables scalable irrigation scheduling, catering to varying farm sizes and crop types.

- **Sustainable Water Management:**

Precise water flow control and automated irrigation scheduling help conserve water resources and promote sustainable farming practices.

- **Enhanced Crop Yield:**

By providing timely and accurate moisture data, the solution facilitates optimal irrigation, leading to higher crop yields and increased profitability for farmers.

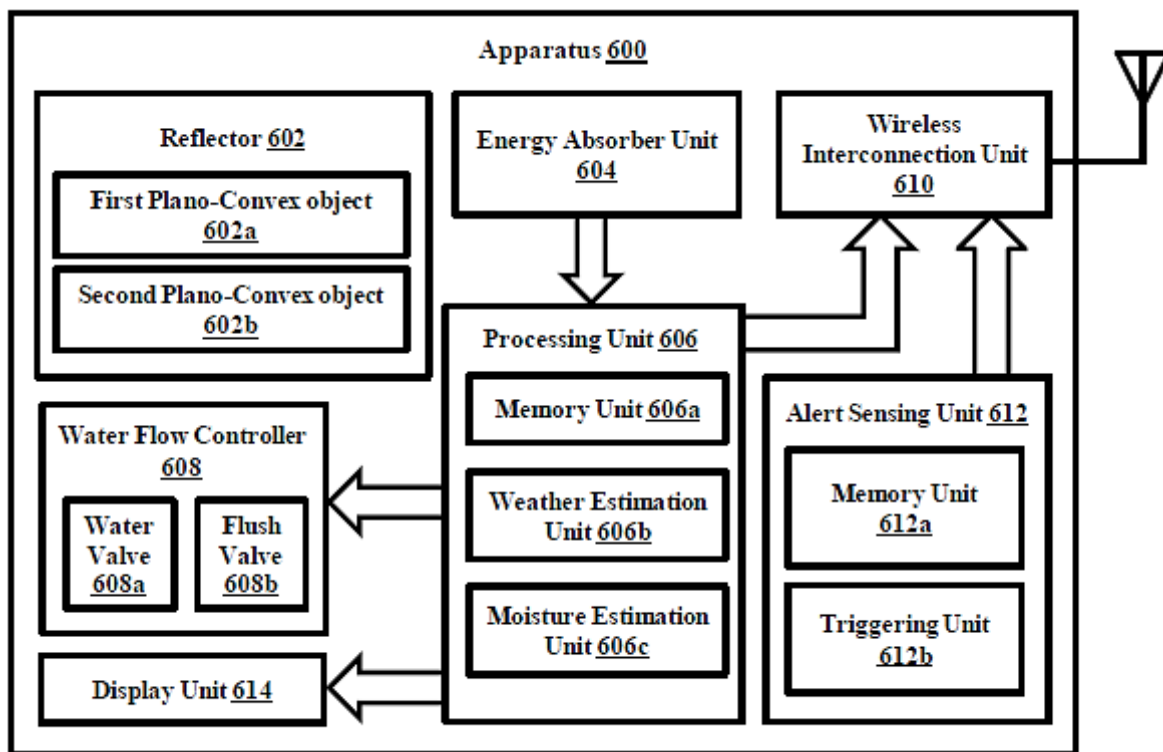


Fig.1. illustrates various units of the proposed apparatus for performing different functionalities.

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