AGRICULTURAL NUTRIENT DELIVERY SYSTEM

PATENTABILITY CASE STUDY

WISSEN RESEARCH
EMPOWERING INNOVATION

INTRODUCTION

The present invention relates to an Agricultural Nutrient Delivery System comprising a storage tank in communication with an irrigation system. The invention addresses an irrigation system containing microbial organisms, carbon, a bio stimulant, sugar, nitrogen-fixing microbes, and phosphate-fixing microbes.

Further, the agricultural nutrient delivery system includes a storage tank, an automated water pump, a recirculation pump, and a light aeration pump.

Our objective was to identify prior art references that either directly disclosed these features or suggested them through a combination of references, thereby assessing whether the invention is new and not obvious.

Connect On :

PHASE-1

The search begins, but no output

Initial searches using keywords like “Agricultural Nutrient Delivery System”, “irrigation system”, “microorganisms”, and “storage tank” yielded limited results. Most patents focus on nutrient storage tanks but do not describe the irrigation system properly. However, the search hinted at potential prior art in US patents and non-patent literature that could be combined to challenge novelty.

CHALLENGES

- Among the various references in the prior art, such as USXXXXX31B2, which discusses a high-concentration complex microbial culture device, there is no disclosure regarding the light aeration pump and irrigation system containing carbon, a bio stimulant, and sugar.
- Similarly, in USXXXXX122A, while irrigation system is described, there is no clear disclosure regarding nitrogen-fixing microbes, phosphate-fixing microbes, a storage tank, an automated water pump, a recirculation pump, and a light aeration pump.

PHASE-2

The Turning Point-Leads, Logics, Classes

In order to improve our search results after our initial search, we decided to brainstorm with our team regarding our reasoning and ideology so we could get better results. We refined the search with the following steps:

- **IPC/CPC Code Integration:** Prioritized codes like Y02P60/00 (Technologies relating to agriculture, livestock or agroalimentary industries), A01G-025/02 (Watering arrangements located above the soil which make use of perforated pipe-lines or pipe-lines with dispensing fittings, e.g. for drip irrigation), C12P1/04 (Preparation of compounds or compositions, not provided for in groups C12P3/00 - C12P39/00, by using microorganisms or enzymes by using bacteria), A01K63/042 (Introducing gases into the water, e.g. aerators, air pumps), and Y02A40/00 (Adaptation technologies in agriculture, forestry, livestock or agroalimentary production) to target technical specifics.

- **Combining Keywords and Classes:** Used terms like “nutrient supply,” “tanks,” “carbon,” “sugar,” and “biostimulants” alongside classification codes like A01K63/042 (Introducing gases into the water, e.g. aerators, air pumps), Y02P60/00 (Technologies relating to agriculture, livestock or agroalimentary industries), A01G-025/02 (Watering arrangements located above the soil which make use of perforated pipe-lines or pipe-lines with dispensing fittings, e.g. for drip irrigation), and C12P1/04 (Preparation of compounds or compositions, not provided for in groups C12P3/00 - C12P39/00, by using microorganisms or enzymes by using bacteria).

- **Global Prior Art:** Included patents and applications from Japan, South Korea, and China to uncover region-specific innovations.

Connect On :

- **Assignee Analysis:** Focused on patents filed by leading manufacturing companies (e.g., BASF, SINOPEC, Hohai University, Locus Ip Co Llc, and Mehrman Edward L) to identify advanced agricultural nutrient delivery system technologies.

- **Inventor Analysis:** Investigated prolific inventors in the domain of nutrient medium for plants. Traced their patent portfolios and publications to uncover overlooked references, including prototypes or experimental designs.

- **Combination Analysis:** Evaluated how disparate prior art references could collectively disclose the storage tank, delivery system, and irrigation system.

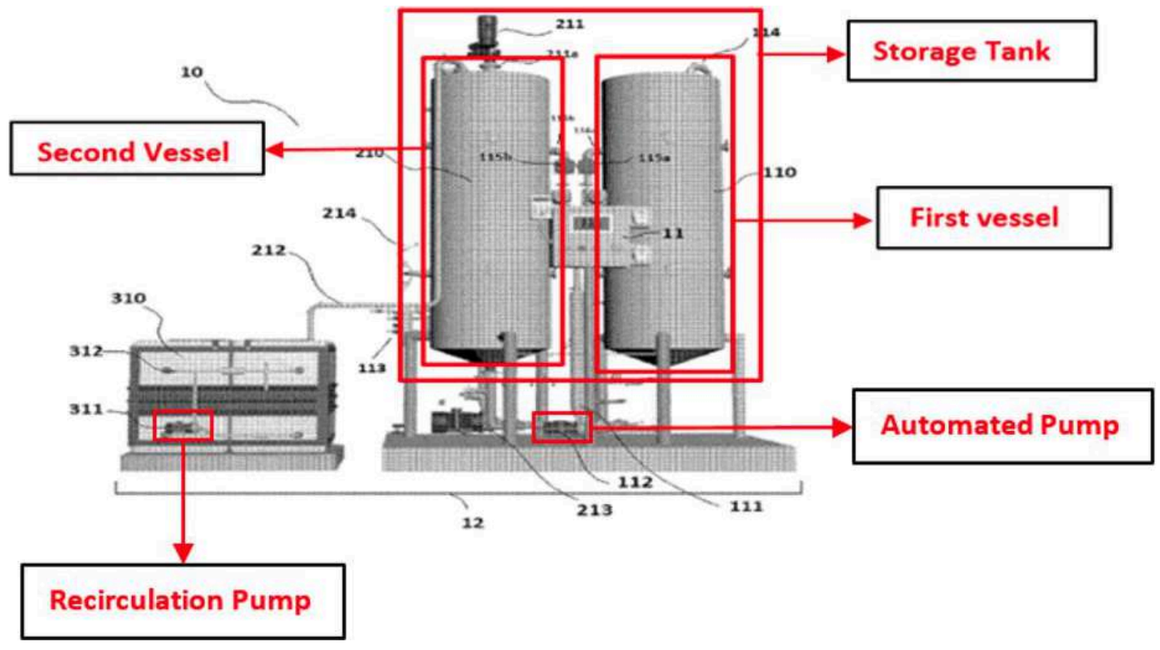
PHASE-3

The Results

The refined search uncovered critical prior art that, when combined, disclosed all features of the invention.

PRIOR ART 1

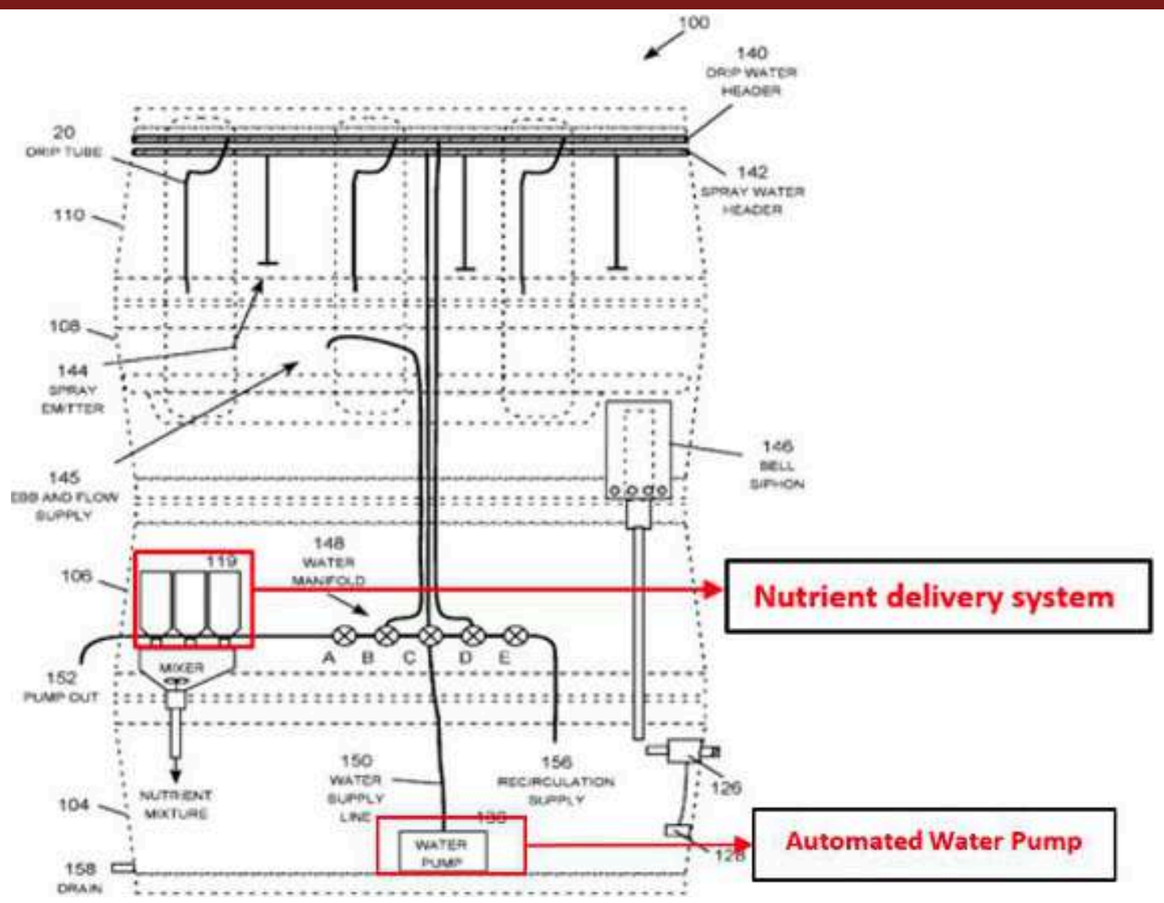
The first promisingresult was a patent from Locus Ip Co Llc., USXXXXXX4126. It describes a system or method for cultivating microorganisms and producing microbial metabolites. The system comprises three separate but connected vessels. The first vessel serves as a feed tank for storing liquid nutrient medium. The nutrient medium comprises carbon, nitrogen, proteins, vitamins, minerals, carbon, sucrose, and carriers upon which microbes can attach and form biofilms. The second vessel serves as a submerged fermentation reactor for microorganisms. The microorganisms used are Azotobacter, Bacillus (nitrogen fixing microbes), Aspergillus, Pseudomonas (phosphate fixing microbes), etc. The third vessel serves as a collection container into which foam containing microbial growth by-products is transferred from the second vessel. Further, the first vessel is connected to the second vessel by a controlled pump, and the third vessel comprises a recirculation system comprising a pump. Also, the second vessel comprises an aeration system that provides filtered air to the culture. However, the explicit information about the aerator, specifically a light aeration aerator is not disclosed.



PRIOR ART 2

We found another relevant patent from Mehrman Edward L, USXXXXXX5368, which discussed about a hydroponic plant growing system that comprises a nutrient delivery system, an automated water pump for recirculating the nutrient solution, and an aerator. The nutrient solution container holds nutrient solutions and other additives, such as sugar. The aerator is present in the pump tank and adds oxygen to the water.

Connect On :



PRIOR ART 3

In the realm of non-patent literature, we came across a product titled “Lighting for aerator”. This document explores the concept of an aerator with LED lighting used in a water system (AQUAMERIK manufacturer and distributor for aquaculture & environment equipment), which makes it obvious to a person skilled in the art to use a light aerator in a nutrient delivery system.

OUTCOME AND IMPACT

- **Novelty:** The research successfully identified key features and technologies involved in the agricultural nutrient delivery system. References themselves and the combination of references demonstrated that the Agricultural Nutrient Delivery System comprising a storage tank in communication with an irrigation system is not novel and obvious to a person skilled in the art.
- **Inventor Credibility:** The inventor’s prior work established that an Agricultural Nutrient Delivery System comprising a storage tank in communication with an irrigation system containing microbial organisms, carbon, a bio stimulant, sugar, nitrogen-fixing microbes, and phosphate-fixing microbes was an obvious extension of existing solutions, weakening the invention’s “non-obviousness” argument.

CONCLUSION

We compiled a report where the features were mapped with the most relevant prior art, and comments were provided to support the mapping where necessary. A search summary, based on the analysis of the invention, is provided at the top of the search report. In the appendix section of the report, important keywords, IPC/CPC classes, & search strategies were included.

TIPS

- A thorough understanding of the invention's unique aspects is necessary.
- Proper documentation and organization of findings are essential for a comprehensive patentability search.
- Exploration of methodologies is crucial to overcome challenges encountered during the search process.