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FULLY MECHANIZED RICE AND WHEAT PRODUCTION WITH A FOCUS ON LOSS REDUCTION

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PART.08

Intelligent Equipment for Rice Production

GPS-based Automatic Navigation System for Rice Transplanters

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- **Technology Employed**
  - **Satellite positioning** and **inertial navigation** for **real-time path correction**.
- **Function**
  - Allows the **rice transplanter** to travel in **straight lines** or along **planned curved paths** with an **accuracy margin of just a few centimeters**.
- **Application effects**
  - Ensures more **uniform transplanting**.
  - Boosts **operational efficiency**.
  - Reduces **manual intervention**.
- **Suitable for:** Large-scale, standardized rice fields.
- **Benefits:** Saves both time and labor.

Auto-Navigation Rice Transplanters

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Core Technology

- **Precision Control:** Maintains straight-line driving and row alignment accuracy within ±2.5 cm.

Advantages

- **Precision Operation:** Significantly improves operational precision, meeting standardized planting needs.
- **Labor Reduction:** Reduces the frequency of manual corrections.
- **Benefit Assurance:** Enhances efficiency and quality of rice seedling transplantation.

Intelligent Unmanned Rice Transplanters

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Technical Integration

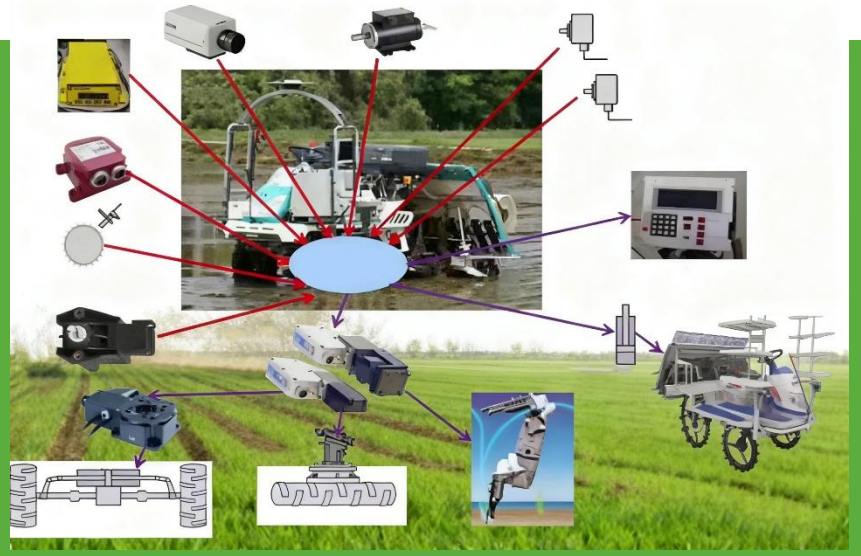
- GPS automatic navigation.
- Machine vision recognition.
- Path Planning technologies.

Operational Features

- Automatically plan routes, precisely locate seedlings, and control row spacing without any human operation throughout the process.

Advantages & Impact

- Plant seedlings quickly and neatly.
- Higher efficiency.
- Better uniformity.
- Advance rice production toward intelligent, large-scale practices.



Unmanned Rice Transplanting Technology

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Technical Components

- Integrates satellite navigation (GPS/RTK), environmental sensing, and intelligent control technologies.

Operational Capabilities

- **Flexible Routing:** Operates along pre-planned or dynamically adjusted paths.
- **Remote Control:** Supports remote monitoring and parameter adjustments.

Advantages & Adaptability

- **Precision & Efficiency:** Ensures fast and accurate transplanting with consistent row and plant spacing.
- **Strong Adaptability:** Adapts well to complex field conditions, enhancing the intelligence and efficiency of rice planting.

Intelligent Monitoring System for Rice-Wheat Combine Harvesters

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Technical Approach

- Uses sensors and algorithms.

Accurate Detection Metrics

- Impurity rate: 1.11%.
- Grain breakage rate: 0.14%.
- Grain loss rate: 0.1%.

Vs. Manual Testing

- **Manual testing results:** 1.46% impurity, 0.10% breakage, 0.34% loss.
- **Improved Detection accuracy** by 0.35%, 0.04%, and 0.24% respectively.

Overall Benefits

- Enhanced detection accuracy.
- Improved operational efficiency.
- Reduced post-harvest losses.

Adaptive Threshing Control System for Rice-Wheat Harvesters

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System Composition

- **Core Component:** Embedded main control unit.
- **Data Source:** Collect real-time data from the CAN bus on operational performance and parameters.

Working Principle

- Combines with intelligent algorithms.
- Optimizes the drum speed and concave clearance control in real time.
- Adjusts dynamically threshing intensity.

Benefits

- Improves harvesting efficiency.
- Reduces the grain breakage rate and impurity rate.
- Achieves precise and intelligent management of the threshing process.

Smart Equipment Integration Via Beidou Satellite System

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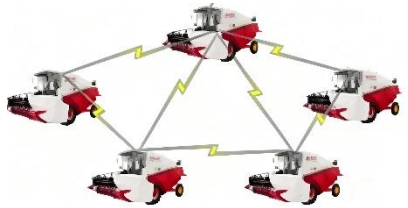
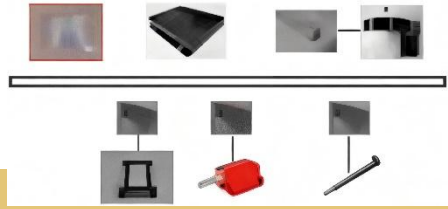
System integration

- Enables collaborative operations and intelligent scheduling of agricultural machinery.





Key Technologies Empowerment

- **Fleet operations**: Master-slave combine harvester fleets communicate through internal and external networks.
- **Navigation and Control**: Using precise positioning, path planning, and obstacle detection for autonomous navigation and tracking control.
- **Function Integration**: Pose recognition, grain tank monitoring, and real-time data acquisition.

Application Value

- Supports prescription-based farming.
- Supports production monitoring.
- Builds a highly efficient and intelligent combine harvester fleet operation system.