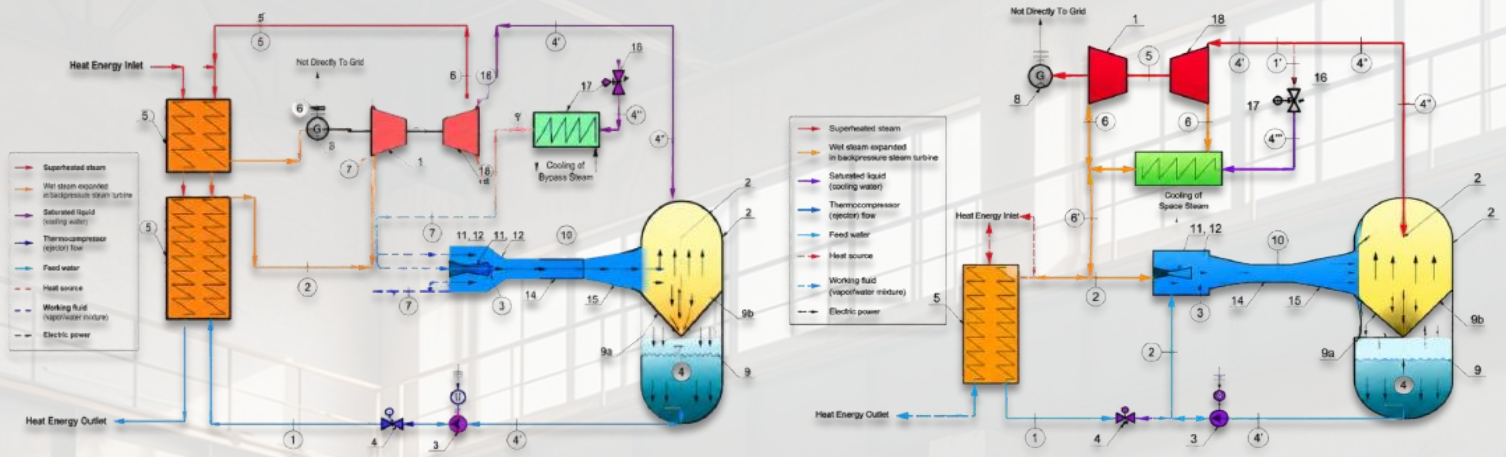


MODIFIED RANKINE CYCLE WITHOUT HEAT REJECTION, DRIVEN BY A WET-VAPOR-REGION THERMOCOMPRESSOR



PATENT DETAILS

Product Name: Modified Rankine Cycle Without Heat Rejection Driven by a Wet-Vapor Region Thermocompressor

Patent Application Number & Filing Date: Application No. 18/364,739 | Filed: August 3, 2023

Patent Number & Grant Date: US 12,404,784 B2 | Granted: September 2, 2025

Patent Status: Granted Patent

Patent Type: Utility Patent

Industry / Technology Sector: Power Generation | Thermal Engineering | Steam Turbine Systems | Waste Heat Recovery | Renewable Energy | Nuclear Energy

Jurisdiction(s): United States

1. INVENTION INTRODUCTION

This invention presents a modified Rankine cycle designed to reduce or eliminate conventional heat rejection by incorporating a wet-vapor region thermocompressor. The system separates saturated water and steam, allowing continuous recirculation of the working fluid while generating useful power. It is applicable to thermal power generation, industrial waste heat recovery, renewable energy systems, and nuclear power applications where improved utilization of thermal energy is desired.

Key Problems & Core Solution

2. KEY PROBLEMS ADDRESSED

Heat loss through conventional condenser systems.

Lower overall utilization of available thermal energy.

Large cooling system and infrastructure requirements.

Limited efficiency of traditional Rankine cycle configurations.

Underutilization of industrial and renewable heat sources.

Challenges in improving thermal cycle performance.

3. CORE SOLUTION / HOW THE INVENTION WORKS

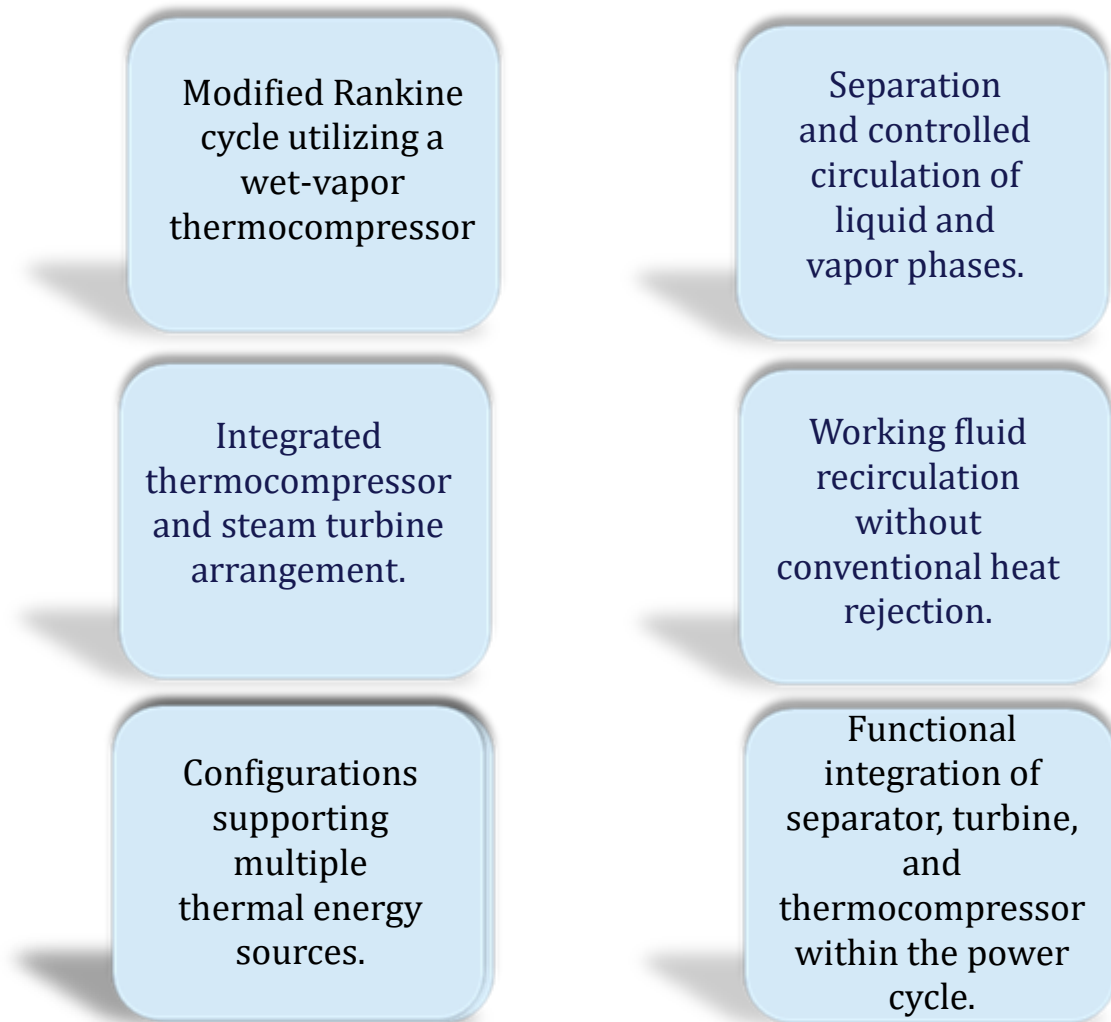
The invention replaces the conventional heat rejection stage with a thermocompressor operating in the wet-vapor region. Saturated water and steam are separated and recirculated through a modified Rankine cycle, enabling continuous power generation while improving thermal energy utilization.

4. KEY UNIQUE FEATURES / DIFFERENTIATORS

- Modified Rankine cycle without conventional condenser heat rejection.
- Wet-vapor region thermocompressor integrated into the cycle.
- Separation of saturated water and saturated steam before recirculation.
- Compatible with multiple thermal energy sources.
- Suitable for combined-cycle and waste heat recovery systems.
- Multiple system configurations disclosed for different applications.
- Designed for integration into existing thermal power technologies.

Protected Features, Applications & Benefits

5. PROTECTED FEATURES (CLAIM-BASED SUMMARY)



6. PRODUCT MANUFACTURING & COMMERCIAL APPLICATIONS

- Advanced steam turbine power systems.
- Industrial waste heat recovery equipment.
- Combined-cycle power plants.
- Renewable thermal power generation systems.
- Nuclear steam cycle equipment.
- Industrial energy recovery installations.
- OEM integration with boilers, turbines, and heat exchangers.
- Suitable for Indian power equipment manufacturers and engineering SMEs.
- Scalable for utility-scale and industrial energy projects.

7. BENEFITS TO MANUFACTURERS / BUYERS / LICENSEES

- Opportunity to expand advanced energy technology portfolios.
- Potential integration into existing thermal power systems.
- Supports development of innovative energy-efficient products.
- Applicable across fossil fuel, renewable, waste heat, and nuclear sectors.
- Suitable for technology transfer and OEM collaborations.
- May strengthen competitive positioning in power generation markets.
- Flexible commercialization across multiple industrial applications.

Licensing / Acquisition Opportunity & Contact

8. LICENSING / ACQUISITION OPPORTUNITY

This patented technology may be commercialized through exclusive or non-exclusive licensing, technology transfer agreements, strategic manufacturing partnerships, OEM collaborations, or outright patent acquisition. The invention offers flexibility for companies seeking to expand advanced thermal power generation solutions, subject to technical evaluation and commercial negotiations. The information is not explicitly disclosed in the patent.

9. ABOUT PATENT MONETIZE

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