



GT Ref: 8824

Press Felt With Variable Stiffness for Improved Dewatering

Category: Industrial Manufacturing Technology

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Summary

This invention introduces a permeable layer of high-stiffness material, such as a steel mesh or metal wires, within or atop the press fabric (felt) used in papermaking to enhance dewatering during the pressing phase. By creating an incompressible region for water transport and disrupting the formation of water channels, this technology aims to minimize rewet, drastically reducing the moisture content of the paper web post-pressing.

Development Stage

Prototype Complete

Problem Statement & Solution

In the papermaking industry, rewetting, or the reabsorption of water from the press fabric after the pressing stage, is a persistent problem. This issue forces the industry to rely heavily on thermal drying, a process that consumes a vast amount of energy, which results in substantial operational costs. Existing methods of papermaking struggle to prevent rewetting, contributing to higher energy expenses and operational inefficiencies, with potential savings in the range of millions annually if the problem is addressed. Moreover, the significant energy consumption has a considerable environmental impact, particularly in mills that depend on fossil fuels for energy.

Researchers at the Georgia Institute of Technology have developed an innovative dewatering technique that significantly mitigates these issues. By creating an incompressible region for water transport, this invention significantly reduces rewet and moisture content in the paper web post-pressing, thus minimizing the need for extensive thermal drying and achieving substantial energy and cost savings.

Advantages

- Significantly enhances water removal through mechanical pressing.
- Reduces the need for energy-intensive thermal drying, saving energy and costs.
- Decreases after press moisture ratio by over 50%, compared to conventional technologies.
- First-of-its-kind incorporation of high-stiffness layers into or on top of the felt.

Commercial Applications

- Energy-efficient dewatering solutions for the paper manufacturing industry.
- Improvement of press felt designs with advanced de-wetting capabilities.



- Energy and cost-saving solutions for paper mills worldwide, with potential savings over \$1 billion in energy costs.

Lead Inventor: Sumner Dudick

Intellectual Property Status: US Patent Filed- [WO2023070098A1](#)

Scientific Publication(s): Scientific Publication(s): Dudick, S., et al. (2022): Solving Rewet to Produce Drier Web. [Georgia Tech, Renewable Bioproducts Institute, RBI Decarbonization Workshop.](#)