TECH SCAN

TEXTILE RECYCLING

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WHERE MIND MEETS MARKET

In a world increasingly attuned to environmental responsibility, recycling textiles is an essential approach in the pursuit of sustainable practices. Textile recycling is an important aspect of the industry's adoption of a new era, as it acknowledges the dire need for eco-conscious practices.

Textile recycling advancements are region-specific; this process encompasses a diverse range of techniques, from mechanical and chemical recycling to innovative biofabrication and advanced sorting technologies. By diverting textile waste from landfills and incinerators, recycling not only conserves valuable resources but also reduces pollution and greenhouse gas emissions associated with its production and disposal. Utilizing the concepts of sustainability and innovation, textile recycling aims to reduce the textile industry's environmental impact while promoting social responsibility and economic development.

As we dive into the landscape of textile recycling, it becomes evident that this revolutionary strategy is not merely about discarding old textiles but rather about developing a future in which the textile sector prospers on ideas of sustainability, innovation, and a circular economy.

INNOVATION TIMELINE

1813

"Shoddy" Process for Recycling Wool Rags into New Yarn

1840

Cotton Rag Waste recycled in Paper Mills

1915-1918

World War I Boosts Textile Recycling Efforts

1930

Mechanical Fiber Separation Technologies developed for Sorting Textiles

1960-1970

Rising Environmental Awareness Sparks Boosts Textile Recycling interest

1970

Chemical Recycling Methods for Polyester and Nylon Pioneered

1980-1990

Advance Sorting and Processing Technologies

1990-2000

Adoption of Extended Producer Responsibility Policies

2010

Emphasis on Closed-Loop Recycling

2017

Enzymatic Recycling Technologies for Cellulosic Fabrics

2019

Digital Sorting and AI-driven Technologies

2022

Bio-fabrication and Upcycling of Textile

2023

Development of Near-infrared Spectroscopy Sorting and Enzymatic Recycling

PATENTABLE COMPONENTS

There are several elements in Textile Recycling that could potentially qualify for patent protection. Frequently, the following domains are examined for patentability:

TEXTILE RECYCLING APPARATUS

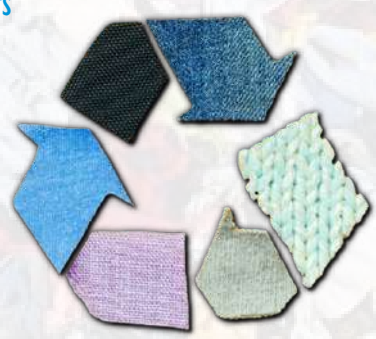
- Bio-based sensors for fabric mixtures
- Procedure of Recycling Textile

CHEMICAL RECYCLING METHODS

- Chemical Recycling Techniques
- Solvents
- Feedstock Engineering
- Processes: Hydrolysis, Alcoholysis, and Aminolysis

ENZYMATIC RECYCLING TECHNOLOGIES

- Cellulosic Fabric Recycling
- Enzymatic Depolymerization Reactors
- Degradable Textile Recycling Device



MECHANICAL SEPARATION TECHNIQUES

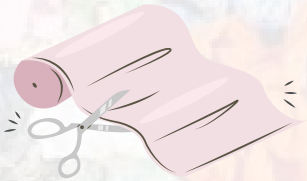
- Multi-stage Shredding and Sifting System
- Magnetic Separation Systems
- Hydrocyclones for Fiber Separation
- Sensors and Detectors Integration

HYBRID RECYCLING SYSTEMS

- Combination of Mechanical, Chemical, and Biological Approaches

SEPARATION AND SORTING TECHNOLOGIES

- Textile Sorting System
- Automatic Sorting Method
- Bio-based Solutions
- Robotic Sorting Systems
- Novel Methods Using Ai
- Triboelectric Effect



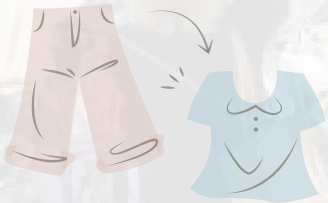
ADVANCED UPCYCLING AND MATERIAL RECOVERY

- 3D Printing Technology
- Nano-coated Surfaces for Upcycling
- Bio-Based Composite Fabrication
- Modular Fiber Regeneration Units

ENERGY-EFFICIENT TECHNOLOGIES

- Low-emission Recycling
- Use of Renewable Energy
- Energy-Efficient Heating and Cooling Systems

CLOSED-LOOP RECYCLING SYSTEMS

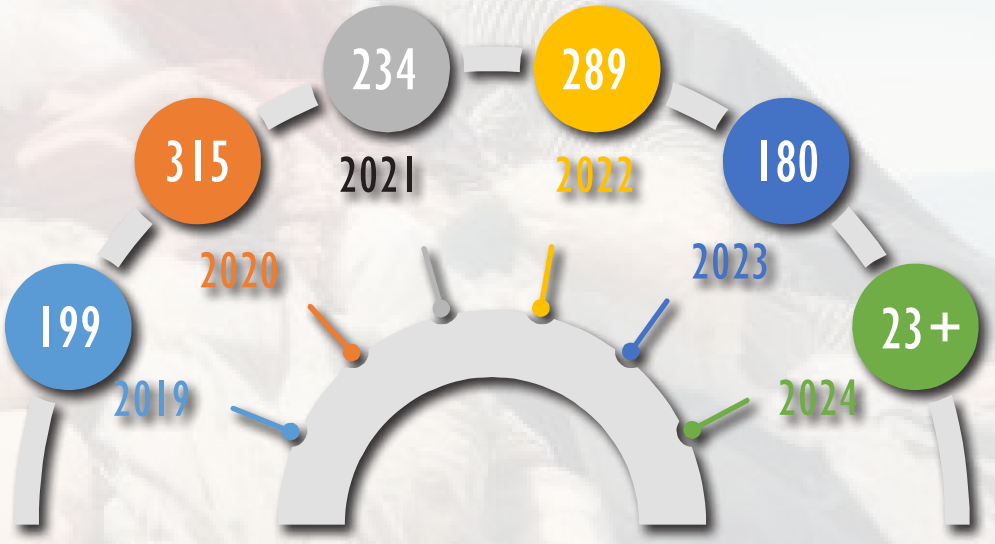


DATA-DRIVEN OPTIMIZATION AND AUTOMATION

- Real-time Process Monitoring System
- Digital Twin Technology
- Automated Maintenance and Cleaning Systems
- Blockchain Based Data Management

PATENT STATISTICS

WORLDWIDE PATENT FILING TIME-LINE



TOP APPLICANTS

17
Anhui Tianzhu Textile Technology

15
Jiangsu Zhufu Technology

13
Hong Kong Research Institute Textiles & Apparel

11
Eastman Chemical

11
Lenzing

10
Donghua University

10
Hong Kong Research Institute of Textiles & Apparel

9
Carbios

9
China Textile Academy

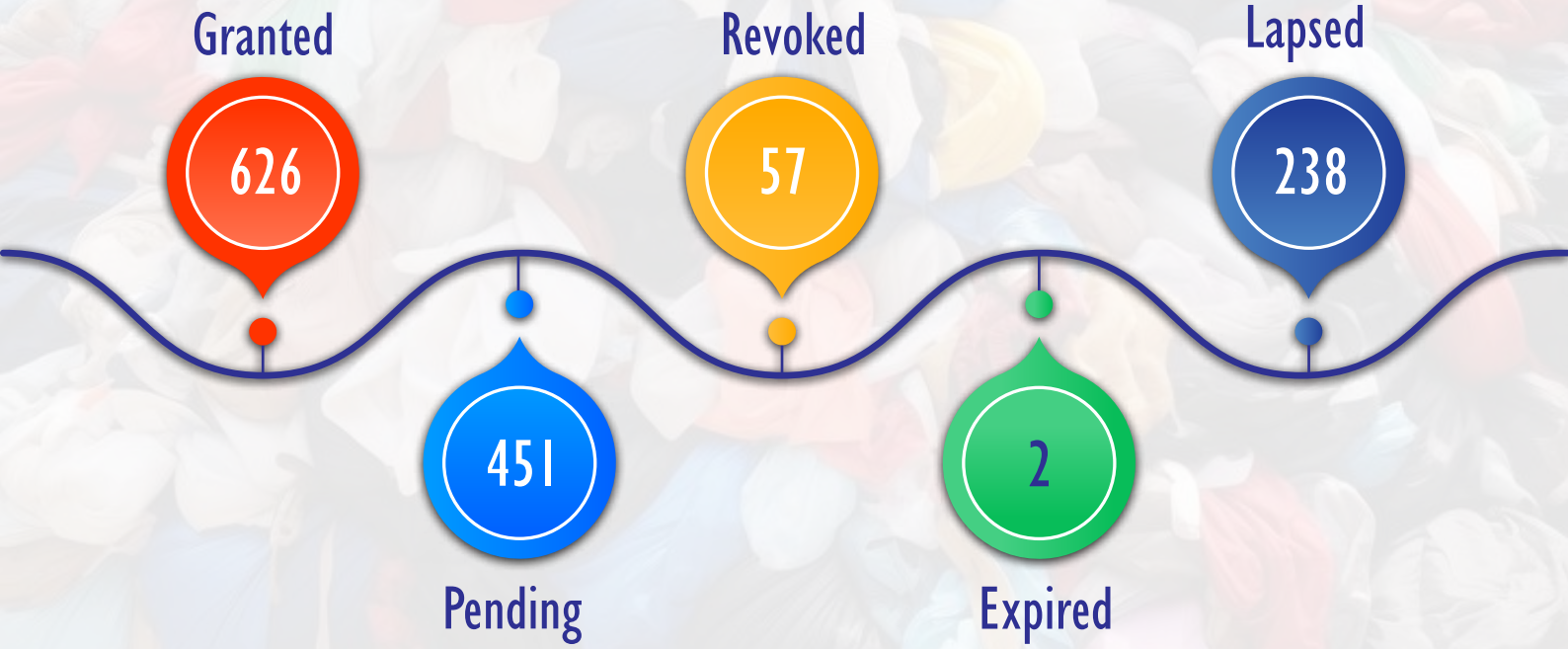
8
Fiberlean Technology

Database: Questel Orbit

Date Range: 01/01/2019 to 22/05/2024

PATENT LANDSCAPE

LEGAL STATUS



Database: Questel Orbit

Date Range: 01/01/2019 to 22/05/2024

NOTABLE INNOVATIONS

Patent Application	Priority Date	Title	Assignee
GB191504096	Mar 15, 1915	Improvements in the Manufacture of Fuel Briquettes	Univ National Dong Hwa
GB484609	Nov 16, 1936	Improvements in the Moistening Treatment of Wool, Shoddy and like Material containing Wool	Suzhou Weijie Textile Co Ltd
GB992518	Oct 13, 1961	Bleaching Cellulosic Textiles	Kipas Mensucat Isletmeleri Anonim Sirketi
US3943220	Sep 30, 1969	Method of producing fiber strand	Hybridworks Chemical Llc
CN107629245	Sep 8, 2017	Recycling Method of Waste and Old Cotton-Polyester Blended Fabric under Hydro-Thermal Condition	Asia Pacific Resources Int Holdings Ltd
US11939406	Mar 29, 2019	Polymers, Articles, and Chemicals Made from Densified Textile Derived Syngas	Apani Systems Inc
WO2022053414	Sep 9, 2020	Dissolvable Thread and Article Containing Same	Valmet Technologies Oy
EP4261342	Apr 15, 2022	Mycotextiles Including Activated Scaffolds and Nano-Particle Cross-Linkers and Methods of Making Them	Regenerated Textile Industries, LLC
CN115082741	Jul 21, 2022	Waste textile classification method based on image processing	Sharetex Ab
WO2024074974	Oct 4, 2022	Method for Recovering Fibres from Discarded Textile Items and Associated Plant	Eastman Chem Co

WHITE SPACES

Quantum-based Ultra-sensitive Sorting Sensors

Unique Molecular Signature for Fiber-level Sorting

Algae Biofabrication for Minimal Environmental Impact

ML for Textile Fiber Composition Detection

Incorporating Nanomaterials for Enhanced Efficiency

AI Predicting Textile Waste Generation

3D Printing with Textile Waste enabling Customization

Textile Nanocomposites for Enhanced Strength, and Self-healing Properties

Robotic Disassembly for Automated Garment Deconstruction

Blockchain Tagging System for Tracking Textile Origin, Composition, and Recycling History

Biodegradable Textile Fibers for Safe Decomposition

Use of Anaerobic Biodegradability Accelerator

Integration of Bioluminescent Elements into Recycled

Engineering Enzymes for Precise Fiber Degradation & Development of Textile-eating Microbes

Breathable, Waterproof Textile Membranes

If you would like to learn more about any of these areas or have specific questions, we're here to provide further information and insights. Our team is dedicated to driving progress and staying at the forefront of Textile Recycling.

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Where Mind Meets Market

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