

# Innovations in Fibres, Textiles, Apparel and Machinery

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## Abstracts

Innovations allow companies to differentiate their products and become more competitive. Recent developments in fibres and yarns include a novel biodegradable linear polylactic acid fibre from Toray which offers excellent textile performance. Textronics has produced an ingenious composite fibre which overcomes the difficulty in providing electrical functionality on fibres that have a curved surface.

In fabrics, a water-repellent swimwear material which “never gets wet” has been developed by coating polyester with a plastron layer of silicone nanofilaments. MMI-IPCO’s unitary thermal fabrics provide variable insulation over different areas of the body, and contain phase change or biomimetic materials.

Cass and Crew have developed a seamless upper-body garment which enhances a woman’s upper body shape but avoids bulges, while Karen E Jones has invented a garment which lifts and shapes the lower body. The company myShape has patented a system which enables the fit of a garment to be tailored remotely to suit an individual customer, Frank D Bryant has a hood which rotates with the wearer’s head, and Nike has patented a method for concealing unsightly drawstrings.

Kimberly-Clark has addressed the problem of inadequate dye exhaustion when applying direct dyes to cellulose fibres by using a polyvinylamine together with an anionic polymer to provide a chemical bridge between the dye and the fibre. The technique also improves the fibre’s wet strength. A sophisticated printing technique has been developed by Anthony M Vassell to enable multiple images to be printed on the back or front of garments worn by sports supporters. Kris T Ziakas has devised an off-beat method for distressing garments using gunfire.

Other textile treatments include an acrylic from Nano-Tex which renders synthetic fibres hydrophilic, giving much greater comfort during wear. A number of treatments for

carpets and medical wear have been developed, including one from Milliken which reduces odours and a novel fluorochemical dirt-repellent additive from 3M. Milliken has also used fluorochemicals in a new stain-release technique.

Tubular Textile Machinery has a mechanised cost-saving concept for controlling the quantity of chemicals used in textile treatments. Trutzschler has invented a device for quantifying debris particles during fibre manufacture, and Ardmel Automation has an ultrasonic or laser seaming apparatus for joining fabric panels in waterproof garments without using sewing thread. A Taiwanese device helps in removing coloured fibre debris from circular knitting machines when yarn colours are changed.

## Contents

### SUMMARY

#### DEVELOPMENTS IN FIBRES AND YARNS

Toray has developed a polylactic acid resin for use in producing biodegradable fibres

Toray's development

Essential features of the Toray development

Minimising the amount of tin present

Minimising the amount of monomer present

Relative viscosity between 2.7 and 3.9

Properties of yarns produced

Manufacturing process

Textronics has developed energy active composite yarns incorporating planar filaments

Existing types of electrically conductive textiles

The Textronics development

Formation of the functional filament

#### DEVELOPMENTS IN FABRICS

A water-repellent clothing fabric which "never gets wet" has been developed using nanotechnology

MMI-IPCO has developed single layer thermal fabrics for garments and upholstery which vary the degree of insulation over different areas of the body

MMI-IPCO's development

#### DEVELOPMENTS IN APPAREL

A seamless upper body support garment which eliminates back lines and bulges has been developed

A new body-shaping garment lifts and supports the buttocks and is compatible with today's form-fitting fashions

A new head covering for hooded jackets offers unobstructed vision

Nike has designed a device for hiding a drawstring in clothing myShape has patented a system for specifying garment dimensions and matching the fit of garments to individual customers

#### DEVELOPMENTS IN DYEING AND COLORATION

Kimberly-Clark has developed a new method for improving the dyeing of cellulose materials

The chemistry

Apparel carrying multiple images has been developed for sports team supporters

## **DEVELOPMENTS IN TEXTILE TREATMENTS AND FINISHES**

Hydrophilic finish for fibrous substrates from Nano-Tex

Milliken has developed an improved approach to the treatment of carpet odours

3M has developed a dirt repellent treatment for use on carpets and medical nonwovens which are made from melt spun fibres

Milliken has patented a textile finish for improving liquid repellency and stain release

The treatment

Quantities

Application

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Tubular textile machinery has patented a new method for controlling chemical treatments used in fabric processing

The current situation

The development

## **DEVELOPMENTS IN APPAREL FINISHING**

Gunfire is used in a new method for distressing a garment

The development

## **DEVELOPMENTS IN TEXTILE AND APPAREL MACHINERY**

System for detecting undesirable particles in textile fibre during production

Apparatus using ultrasonic or laser seaming for joining fabric components without the use of thread

Drawbacks of existing ultrasonic technologies

Pai Lung has developed a device for removing yarn debris from circular knitting machines during colour changes

The problem

The solution

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