

## **US20170044294 - Bio-based superabsorbents prepared via the macromonomer approach**

WASHINGTON STATE UNIVERSITY

Published 2017-02-16

A novel bio-based superabsorbent polymer material based on a proteinaceous natural polymer is introduced herein. There is further disclosed a method for the manufacture of such a bio-based crosslinked superabsorbent polymer material. The method includes, but not limited to, introducing polymerizable unsaturated groups onto the natural polymer or its derivative so as to yield a macromonomer. The macromonomer can be formed by covalently binding unsaturated carbon-carbon double bonds to a proteinaceous substrate through a reaction of a selected chemical compound and the amino group on the proteinaceous substrate. The macromonomer is then copolymerized with unsaturated co-monomer(s) to form a crosslinked superabsorbent material.

## **US2017029549 - Bio-based polymer nanoparticle and composite materials derived therefrom**

ECOSYNTHETIX

Published 2017-02-02

Methods of producing a latex, and the resulting latexes, are described herein. Bio-based colloidal particles are used in a free radical polymerization process. The particles may provide one or more of a seed particle, stabilizing agent, Pickering emulsifier, surfactant or co-monomer. Optionally, the particles (or biopolymer molecules such as starch in the particles) are functionalized, for example to provide double bonds or free radicals, prior to or while conducting a free radical polymerization reaction including the particles and a second compound which is a monomer. In another option, the particles are used in the presence of a functionalizing agent (capable for example of providing double bonds or free radicals on a biopolymer) in a free radical polymerization reaction. Optionally, the resulting latex may include particles of a mixed morphology including a bio-based phase. Methods of functionalizing bio-based particles and, in some cases, resultant particles (intermediate reaction products) are also described.

## EP2975083 - Method for the stabilisation of biobased plastic based on polyester resin

RHEIN CHEMIE RHEINAU

Published 2017-01-25

The object of the invention is a method for stabilizing polyester-resin-based bioplastics by means of specific carbodiimides.

## US2017002136 - Polymer compositions produced from biobased ethanol

NOVOMER

Published 2017-01-05

The present invention provides terephthalic acid in which two of the aromatic ring carbons are derived from ethanol. The present invention also provides PET, PTT, and PBT polymer compositions, and plastic molding compositions and manufactured goods thereof, wherein each repeat unit in a polymer composition can comprise four ethanol-derived carbon atoms.

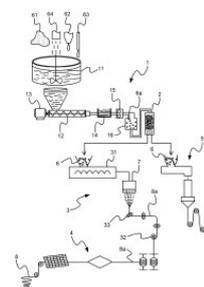
## US2016369434 - Apparatus of fabricating environmentally friendly water-repellent colored fabrics

AUSPRING

Published 2016-12-22

An apparatus is provided to make fabrics.

The fabrics are environmentally friendly, water-repellent and colored. A pigment, a C4 fluorine-containing compound, a dispersant and a related polymer substrate carrier are bond to obtain water-repellent colored masterbatches. The C4 fluorine-containing compound is environmentally friendly while being free of perfluorooctanoic acid (PFOA) and perfluorooctane sulphonate (PFOS). The masterbatches are spun into yarns for making a fabric with the pigment and the C4 fluorine-containing compound uniformly mixed. Thus, the present invention significantly reduces waste water pollution from dyeing and processing without generating environmentally harmful PFOA and PFOS.



## US9512249 - Bio-based block polymers derived from lignin and fatty acids

UNIVERSITY OF DELAWARE

Published 2016-12-06

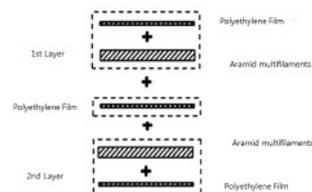
The present invention pertains to bio-based block polymers synthesized from functionalized lignin-based molecules (A-monomer) and functionalized fatty acids or fatty alcohols (B-monomer) derived from plant or animal oils, waxes or fats. The block polymers can be synthesized via numerous polymerization techniques, such as reversible addition-fragmentation chain transfer (RAFT). Most importantly, this class of bio-based block polymers shows promise as providing sustainable yet scalable and tunable thermoplastic elastomers and pressure-sensitive adhesives, among other applications.

## EP3086077 - Bulletproof vest using unidirectional aramid sheet and polyethylene film and method for manufacturing same

HYOSUNG

Published 2016-10-26

The present invention relates to a ballistic cloth using a unidirectional aramid sheet and a polyethylene film and a method for manufacturing the same and, more particularly, is characterized in that aramid multifilament layers, which have monofilaments stacked and arranged in one direction, are arranged perpendicularly, a polyethylene film, which plays both the role of a binder and the role of protecting the sheet surface, is arranged between the aramid multifilament layers to manufacture a ply, and the ply is inserted into a mold and undergoes a pressing process and a cooling process, thereby manufacturing a ballistic cloth. A ballistic cloth manufactured by the method according to the present invention is advantageous in that use of a polyethylene film having a low softening point between unidirectional aramid sheets improves adhesiveness between the sheets and also improves the slip factor when the same ply is stacked, thereby exhibiting excellent ballistics performance. In addition, since the binder is solely made of a film, odor-free, environment-friendly manufacturing processes can be employed, no freezing is needed during storage; improved flexibility of the sheet facilitates delivery and distribution of impacts of bullets when the ballistic cloth is worn, thereby improving the ballistics performance and making the ballistic cloth further lightweight; and the polyethylene film, which is the protective layer of the unidirectional aramid sheets, has an adhesive strength of at least 2kgf, thereby improving the ballistics performance.

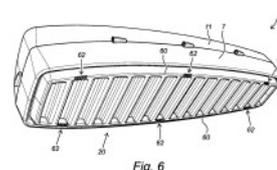


## WO2016114654 - Injection-molded box, preferably suitable as a coffin, method for injection-molding such a box

ONORA

Published 2016-07-21

Injection-molded box, preferably suitable as a coffin, comprising a bottom wall and upright walls connected to the latter, which is made from a plastic which comprises a bio-based plastic as its main component, wherein the bio-based plastic comprises polylactic acid, and wherein the bottom wall is provided with a reinforcing structure, characterized in that the design of the reinforcing structure is such that adjacent walls within the reinforcing structure satisfies a modified release angle of at least 3 degrees, preferably at least 6 degrees, and most preferably at least 10 degrees.



## US9441084 - One-pot, high-performance recycling method for polymer waste achieved through renewable polymer synthesis

POLY6 TECHNOLOGIES

Published 2016-09-13

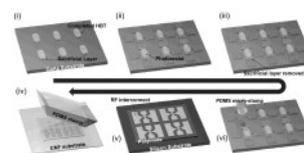
Compositions and processes for development of sustainable materials based upon a method of thermoplastic polymer recycling with a solvent that is also a monomer for renewable polymer synthesis. By combining petroleum-derived polymers with bio-based monomer feedstocks, biphasic, blended polymer products are produced and are shown to exhibit facile tunability of physical and material properties. This one-pot, solvent-based recycling approach yields neat recycled products without the use of solvent evaporation or solute precipitation, and the functional utility of the resulting polymer blends greatly exceeds that of either homopolymer alone.

US9437628 - Biodegradable microwave electronic devices

WISCONSIN ALUMNI RESEARCH FOUNDATION

Published 2016-09-06

Substantially biodegradable microwave integrated circuits and method for making the microwave integrated circuits are provided. The integrated circuits, which have applications in high performance flexible microwave and digital electronics, utilize biobased, biodegradable cellulose nanofibril films as a substrate and comprise only very small amounts of potentially toxic inorganic materials.



## EP3060590 - Curable fluorocopolymer formed from tetrafluoropropene

HONEYWELL

Published 2016-08-31

The present invention is directed to partially fluorinated copolymers and the production thereof. More specifically, the copolymers, which are preferably produced by a solution polymerization process, preferably have at least three units, the first unit selected from 2,3,3,3-tetrafluoropropene and 1,3,3,3-tetrafluoropropene, the second unit having a polymerized monomer selected from the vinyl esters and vinyl ethers, and the third unit having a polymerized monomer derived from a hydroxyl group-containing vinyl ether. The resulting copolymer is environmentally friendly, has favorable molecular weight characteristics, and may be shipped economically in high concentration.

## EP3053964 - Soft glycol-modified polyethylene terephthalate (petg) resin composition and extruded article comprising the same

YOUNGIL

Published 2016-08-10

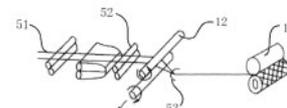
The present invention relates to a soft glycol-modified polyethylene terephthalate (PETG) resin composition and an extrusion molded article comprising the same, and more particularly, to a soft PETG resin composition, which comprises a PETG resin, a vegetable oil for reducing the hardness of the PETG resin, a TPEE (thermoplastic polyester elastomer) resin and MBS (methyl methacrylate butadiene styrene) resin for improving the physical properties of the PETG resin, and a processing aid for improving the physical properties and processability of the PETG resin, and which can be formed into an environmentally friendly film or sheet, and to an extruded article comprising the soft PETG resin composition. In a preferred embodiment, the soft glycol-modified polyethylene terephthalate (PETG) resin composition comprises 100 parts by weight of a PETG resin, 25-60 parts by weight of a vegetable oil, and 25-120 parts by weight of a thermoplastic polyester elastomer (TPEE) resin

## EP3040457 - Production process of environment-friendly denim fabric and production line thereof

TAT FUNG TEXTILE

Published 2016-07-06

The present invention provides a production process characterized in that a false twisting process is added between a spinning process and a winding process so that yarn slivers undergo excessive pre-torsion in an



axial direction and twists which are same in quantity but different in twisting direction are generated on the yarn slivers. Absorption of glucose-containing sulfur dyestuff is performed in a dyeing process. An ammonia removal process is performed in a high-temperature and high-pressure tank so that residual ammonia in a fabric is evaporated. The evaporated ammonia is collected and then fed back to a mercerizing process for continuous use. The present invention also provides a production line including a spinning unit having a false twisting device, a dyeing unit configured to realize the dyeing process, and a liquid ammonia finishing unit consisting of a fabric mercerizing device, an ammonia removal device, an ammonia recycling device and a controller.

### **DE102014223470 - Flexible, thermally stable and bio-based film based on polylactic acid transparent, a formulation for the production of the film and its use**

TESA

Published 2016-05-19

The invention relates to a bio-based film comprising a composition based on poly(lactic acid), said composition containing the following components: (a) at least one bio-based co-polymer based on at least one lactic acid derivative; (b) at least one plasticizer comprising at least one compound which contains at least one ester group, excluding dimeric and polymeric esters of lactic acid; (c) at least one nucleation agent; and (d) optional additives.

### **EP3019558 - Bio-based polymer blends and methods of making fibers**

INTERFACE

Published 2016-05-18

Polymer blends include bio-based polymers or copolymers with post-consumer and/or post-industrial polymers or copolymers and a compatibilizer. Fibers may be prepared from the polymer blends. In addition, a life cycle analysis of the polymer blends may be superior in at least four of seven categories of the life cycle analysis relative to virgin polyamide 6.6.

Methods of making the fibers from polymer blends are also described.

The polymer blends are particularly useful in flooring applications, such as carpeting.

## **US9328192 - Bio-based monomers and polymers**

BEZWADA BIOMEDICAL

Published 2016-05-03

Described are novel ricinoleic acid/12-hydroxy stearic acid-based diisocyanates, which are useful as monomers to form polymers, which have applications inter alia as medical devices.

## **US2016075901 - Environmentally friendly rubber composition**

WCCO BELTING

Published 2016-03-17

Belting for use in a conveyor. The belting includes a fabric base and an environmentally friendly rubber composition. The environmentally friendly rubber composition is applied to at least one surface of the fabric base. The environmentally friendly rubber composition includes a rubber component, a filler, a processing oil and a vulcanizing agent. The filler is provided at a concentration of between about 50 and 150 percent by weight of the rubber component. The processing oil is substantially devoid of aromatic oil. The processing oil is provided at a concentration of between about 20 and 60 percent by weight of the rubber component. The vulcanizing agent is provided at a concentration of between about 1 and 10 percent by weight of the rubber component.

## **EP2990450 - Antifouling paint composition, copolymer for antifouling paint composition and method for manufacturing same, and painted object having on surface antifouling paint film formed using said composition**

NITTO KASEI

Published 2016-03-02

The purpose of the present invention is to provide a copolymer allowing for an antifouling coating composition used for the formation of an environment-friendly antifouling coating film.

The antifouling coating composition gives the coating film increased water resistance and can maintain the stable dissolution property and antifouling performance of the coating film without causing coating film defects such as a crack during long-term seawater treatment.

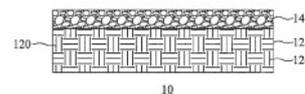
An aspect of the present invention provides a copolymer for an antifouling coating composition, including a copolymer (A) having, on a side chain, a group represented by chemical formula (1) and having, on terminal, at least one of a group represented by chemical formula (2) and a group represented by chemical formula (3).

## US2016053434 - Composite filament textile and environment-friendly composite filament artificial leather manufactured using the same

SAN FANG CHEMICAL INDUSTRY

Published 2016-02-25

An environmental-friendly composite filament artificial leather includes a composite filament textile and an elastomer film. The composite filament textile is made of composite filament. The composite filament includes at least one core portion and a sheath portion. The at least one core portion is a polyester-type polymer, a polyamide polymer or a polypropylene polymer. The sheath portion sheathes the at least one core portion, and the sheath portion is a thermoplastic elastomer. The elastomer film is bonded with the composite filament textile. The elastomer film is made of one selected from the following materials: thermoplastic polyurethane (TPU), thermoplastic polyester elastomer (TPEE) and thermoplastic polyolefin (TPO). By this way, an environment-friendly artificial leather of lightweight, good abrasion, good touch feeling and well dimensional stability can be manufactured. Furthermore, the artificial leather can be manufactured without use of any solvent, so as to conform to the environment protection requirement.

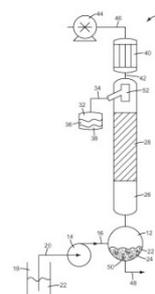


## EP2970093 - Method for preparing (meth)acrylates of biobased alcohols and polymers thereof

3M

Published 2016-01-20

Polymers, particularly those used in pressure-sensitive adhesives, are prepared from a mixture of structural isomers of a secondary alkyl (meth)acrylate monomer. The mixture is made by dehydrating a biobased C<sub>2</sub>-C<sub>22</sub> alcohol with a first acid catalyst using a continuous process to form a mixture of olefins, and reacting (meth)acrylic acid with at least some of the mixture of olefins in the presence of a second acid catalyst. The adhesives are characterized by exhibiting an overall balance of adhesive and cohesive characteristics, and containing biobased material.

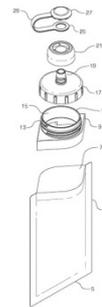


## US2015375901 - Reusable, eco-friendly container for storing and dispensing food and beverage

ORLICH KAREN J (Inventor)

Published 2015-12-31

The present invention provides a container for storing food and/or beverage, specifically designed for use with infants and young children to adults, constructed of a reusable, ecofriendly fabric and materials.



## WO2015183086 - Process for obtaining a labelled meat product

HET KAASMERK

Published 2015-12-03

The invention is directed to a process for obtaining a labelled meat product by applying a label comprising a bio-based polymer to the surface of a meat product using a bio-based adhesive comprising an enzyme and optionally a mediator. The bio-based adhesive may comprise thrombin or a source of thrombin as the enzyme and fibrinogen as the mediator.

## US2015259843 - Natural finish fabric

WELSPUN INDIA

Published 2015-09-17

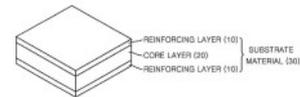
A method for producing environmentally friendly fabric and textile products without use of chemicals comprises a finishing process including the steps of: singeing, enzyme desizing; water washing, peaching, stentering, and sanforizing. The steps of the finishing process are purely physical and preferably uses only water, water vapor (steam), and enzymes, and not chemicals including chemical agents. As such, the finishing process is believed to be environmentally friendly.

## EP2881249 - Natural fiber polymer composite and eco-friendly lightweight base material for automotive interior

HANIL & HWA

Published 2015-06-10

The present invention relates to an eco-friendly lightweight substrate material for the automotive interior, characterized in that isocyanate or epoxy is added to enhance the function of a substrate material having a sandwich-type structure for the automotive interior including natural fiber that is vulnerable to high temperature and humidity conditions, preventing degradation of physical properties by water-impregnation into the natural fiber and thus enhancing the humidity-resistance and strength of a natural fiber reinforcing layer; and the substrate material is continuously prepared in a thermoplastic foam sheet core layer by thermal-laminating. The substrate material prepared according to the present invention is an eco-friendly material, also is capable of weight lightening by weight reduction, and is excellent in humidity-resistance and strength, thus providing for application to various industries such as train interior, aircraft interior, and architectural interior as well as automotive interior.



## EP2845931 - Environmentally friendly non-bleed polyester fabric and method of manufacturing the same

WINDS ENTERPRISES

Published 2015-03-11

A method of manufacturing a polyester fabric with inherent color, the method including: providing a polyester fiber with inherent color; spinning polyester yarn from the fiber with inherent color; knitting the colored polyester yarn into knitted fabric which can combine with other yarn according to a requirement; washing the colored polyester fabric and heat-setting the fabrics with add-on functional finish to the fabric. The providing of polyester fiber with inherent color may include: cleaning and drying polyester bottles; recycling polyester chips from clean bottles; mixing chips with pigment evenly and melting the chips with pigment; extruding the filament fiber with color; and drawing and cutting filament fiber into staple fiber. Further aspects of the present invention are directed to a colored polyester fabric and a method of manufacturing an article of clothing using a colored polyester fabric produced using the above-described method.