

Patent alert December 2024

Hemp: from harvesting to applications in textiles and plastics industries

This month's selection in brief

2024 witnessed a continuing trend toward the search for alternative bio-based raw materials and biomass valorization in the textiles and plastics industries. Among these materials, industrial hemp is particularly regaining interest for use in textile products. This month's selection highlights a few innovations from the harvesting of hemp to fibers recovery and processing into woven and nonwoven fabrics. In addition to its fibers, hemp contains oils which find applications within the plastics industry.

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Hemp picking machine for picking hemp

Patent number: WO2023187767

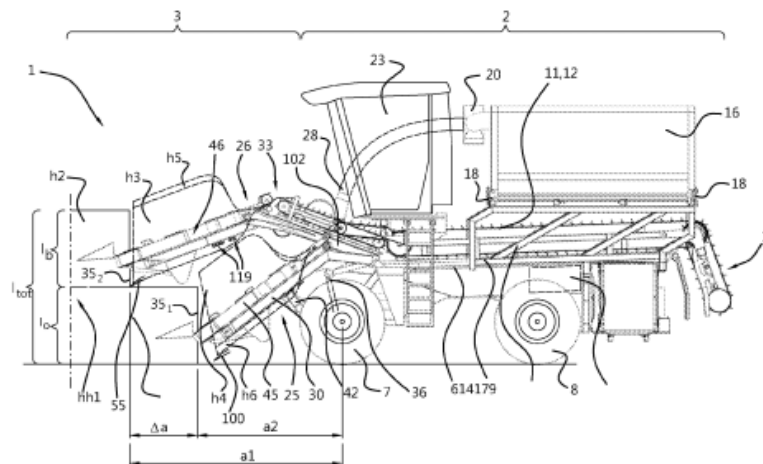
Publication date: 2023-10-05

Applicant(s): HYLER BV, <https://www.hylar.be/en/>

Inventor(s): BAERT NIELS

Summary

Described is a hemp machine (1) for processing hemp. The hemp machine comprises a self-propelling vehicle comprising a vehicle chassis (6) and a hemp picking unit (3) mounted on the vehicle chassis for the purpose of picking the fibre plants. The hemp picking unit (3) comprises a first picking element (25) embodied to pick the lower part of the fibre plants, and a second picking element (26) embodied to pick the upper part of the fibre plants. The second picking element has a cutting unit (55) for cutting the fibre plants at a position between the upper and lower part of the fibre plants.



<https://www.hylar.be/en/machine/hylar-sativa-fl20/>



Method for wet processing of hemp fibers

Patent number: US11739454

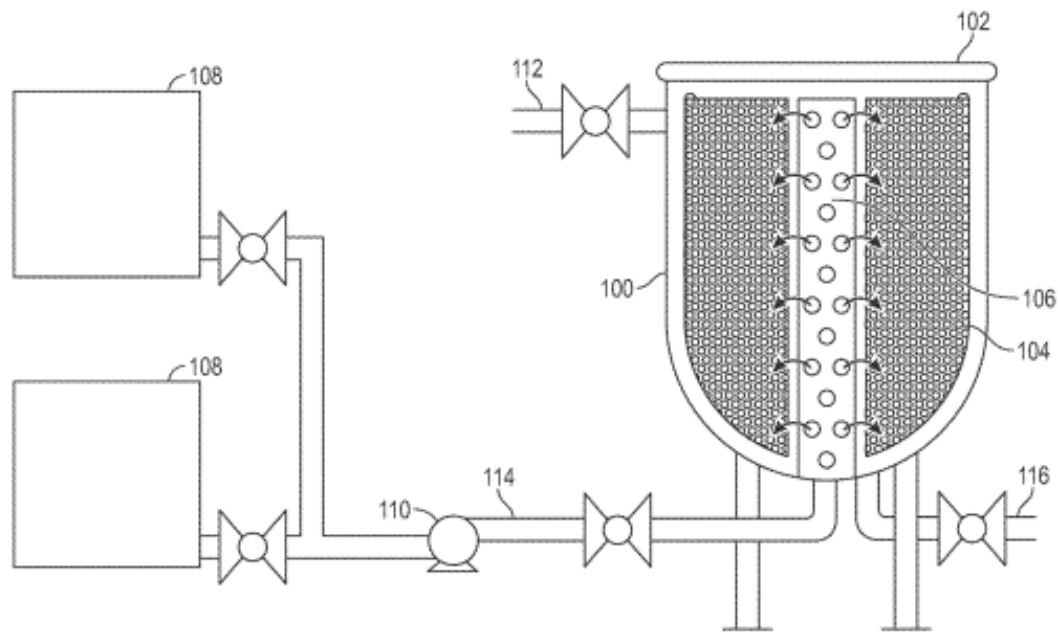
Publication date: 2023-08-29

Applicant(s): BASTCORE INC, <https://bastcore.com/>

Inventor(s): MILLER III ROBERT A

Summary

A method for wet processing of hemp fibers for commercial use is provided. The method includes steps of loading raw hemp fibers with water into a vessel and heating the contents of the vessel. The method also includes the addition of a sequence of certain chemical compounds, which include a scouring agent, a wetting agent, a caustic compound, an acidic compound, a lubricant, and a softening agent. The water may be heated to boiling during the process to aid in opening up the fibers during processing. Peroxide is not utilized in the process. The process produces commercially viable quantities of hemp fibers that are soft, clean, and easily spinnable while maintaining fiber burst strength.



Hemp-based char or oils and polymers formed as fibers or films having enhanced properties

Patent number: EP3959261

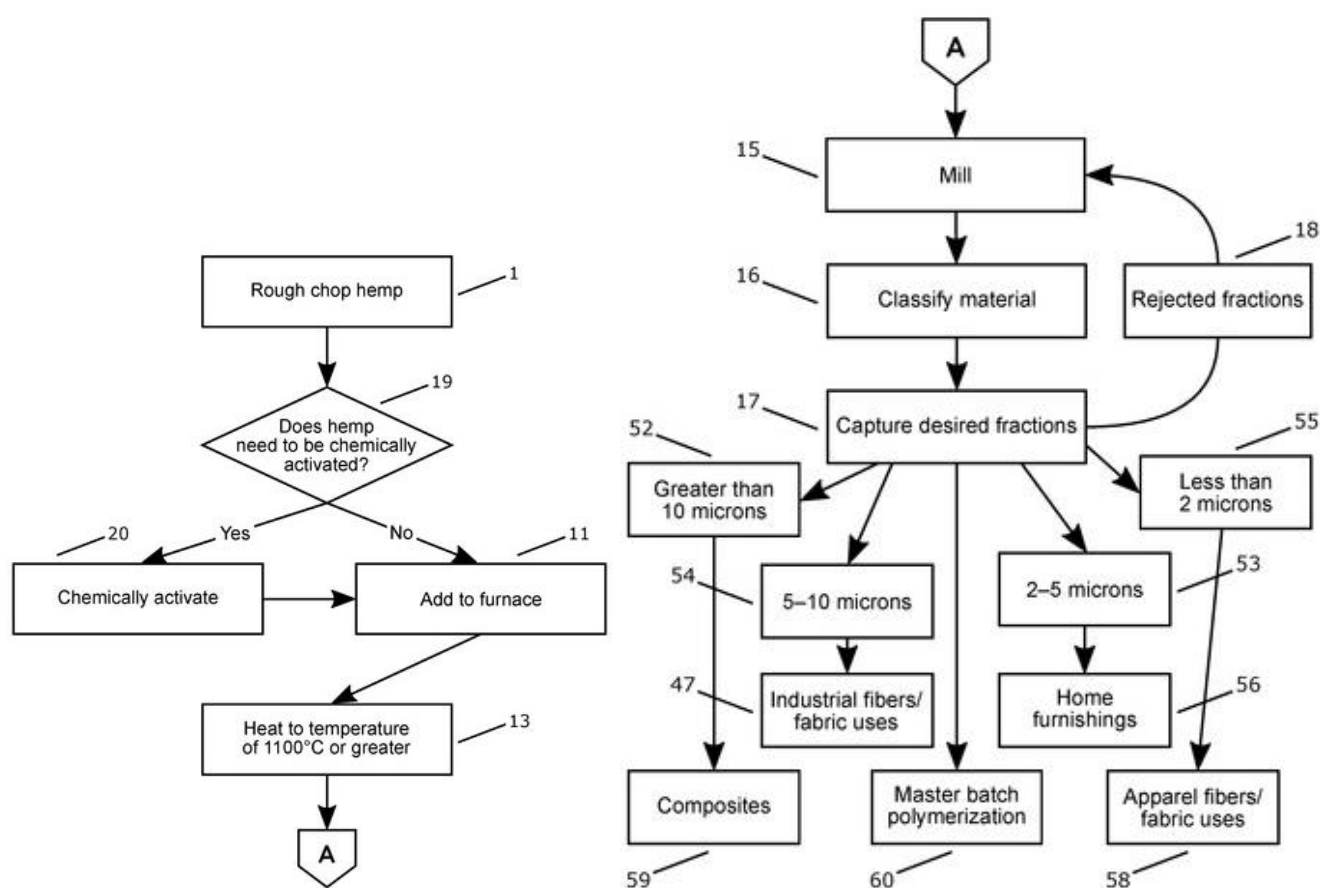
Publication date: 2022-03-02

Applicant(s): Thomas Jefferson University; Ecofibre USA Inc, <https://ecofibre.com/companies/ecofibre-advanced-technologies/>

Inventor(s): SUNDERLAND MARK; BRUNER JEFFREY WILLIAM; WILLIAMS LEE BENJAMIN

Summary

A process of forming a fiber comprised of a plurality of bio-char particles, comprising: combining a portion of a polymer with a hemp derivative, said hemp derivative selected form a hemp carbon made by pyrolyzing a quantity of hemp stalk at between 1100-1500°C to create a char; adding the char to a milling vessel and milling the char for a period of between 1 to 16 hours, and a full spectrum hemp extract, or combinations thereof, wherein the polymer and hemp derivative are extruded to form a fiber.



Melt extrusion of hemp-based thermoplastics

Patent number: US11802207

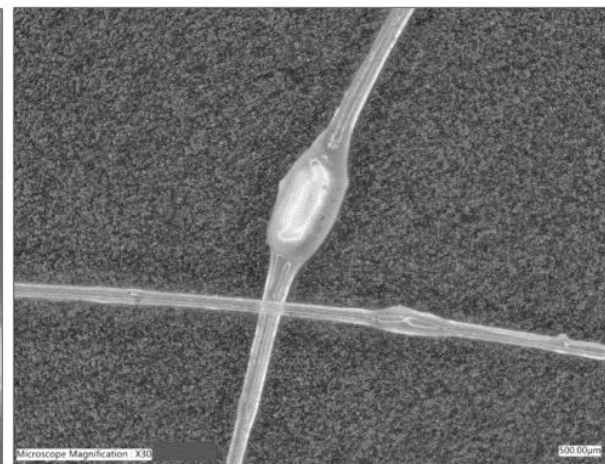
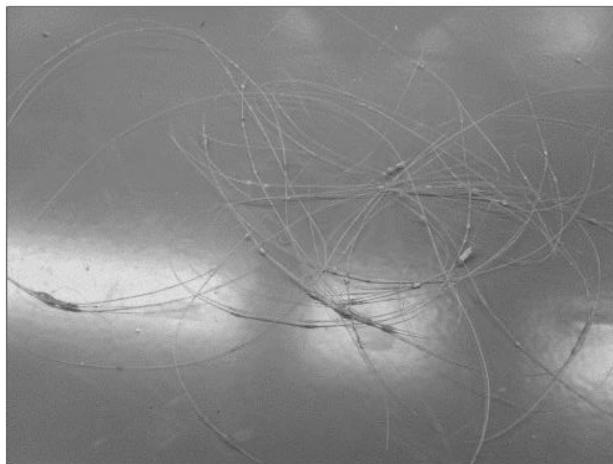
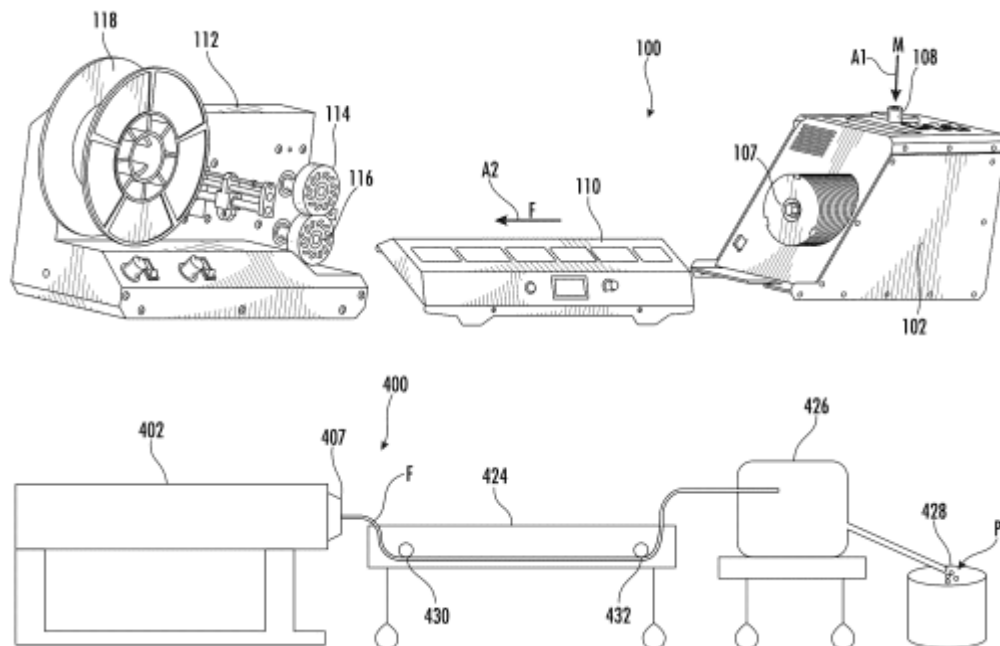
Publication date: 2023-10-31

Applicant(s): North Carolina State University

Inventor(s): FORD ERICKA N; BISWAS MANIK CHANDRA

Summary

Methods of preparing a lignocellulosic biomass-based thermoplastic composition are described. In some embodiments, the method comprises: (a) preparing a mixture of solids comprising lignocellulosic biomass, a meltable solvent and a polyester; and (b) melt-compounding said mixture of solids; thereby preparing a lignocellulosic biomass-based thermoplastic composition. Fibers produced by the methods are also described, as are yarns and fabrics comprising the fibers.



Method for manufacturing a biosourced hemp fiber packaging device

Patent number: FR3136188

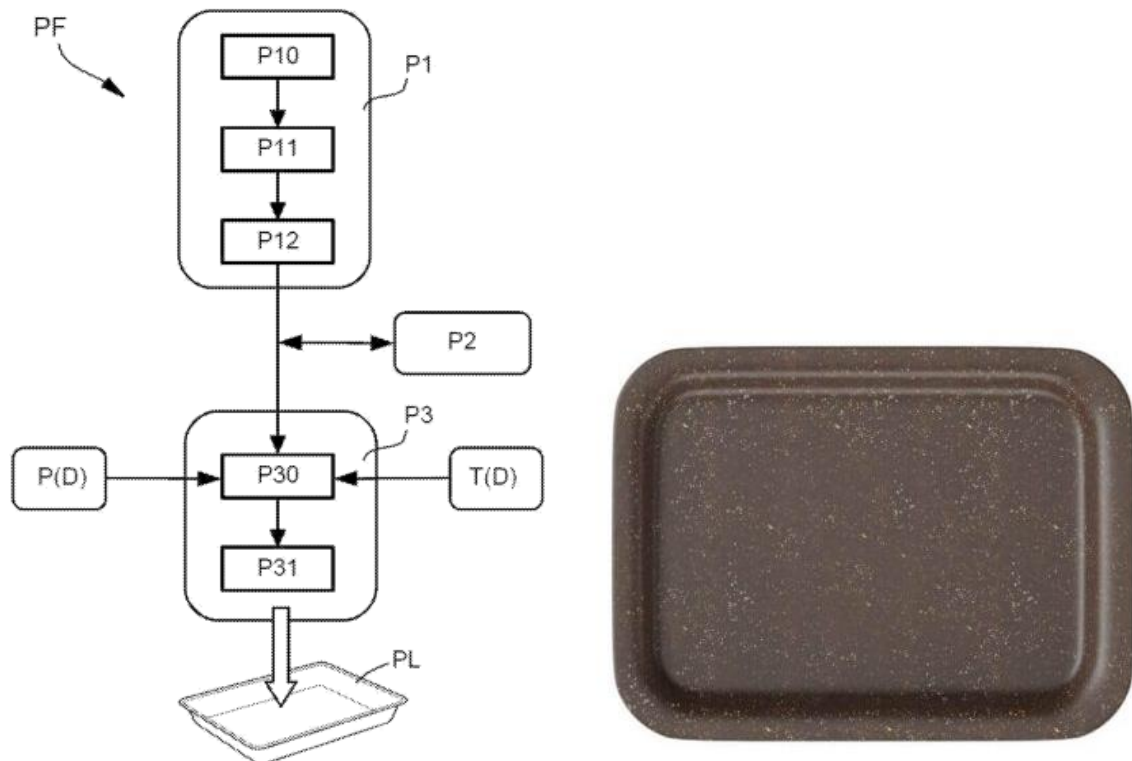
Publication date: 2023-12-08

Applicant(s): HEMPAK, <https://hempak.com/>

Inventor(s): LAUDET GERARD; BARBIER FRANCK

Summary

The process comprises a first phase (P1) of the preparation of a fibrous suspension from raw hemp fibers and a second phase (P3) of the manufacture by thermo-pressing, injection molding or extrusion of the packaging device (PL) from the suspension, the first phase comprising the steps of: a) cleaning treatment and separation of the raw fibers and reduction of the lignin; b) treatment of the fibers obtained in step a) with a advancing stack so as to shorten them to a length of between 0.5 and 1 mm; c) preparation of the suspension in the non-shearing propeller disintegrator by mixing a predetermined quantity of additives with a predetermined quantity of pulled fibers obtained in step b) with a predetermined quantity of water, the additives comprising alkyl ketene dimers (AKD) and vegetable wax; and d) drying and drying the suspension until a predetermined moisture content is obtained. Fig.1.



<https://hempak.com/product/biodegradable-hemp-rolling-tray/>

Method for the production of a semifinished product of hemp and of a product made through said semifinished product and related systems

Patent number: EP4414491

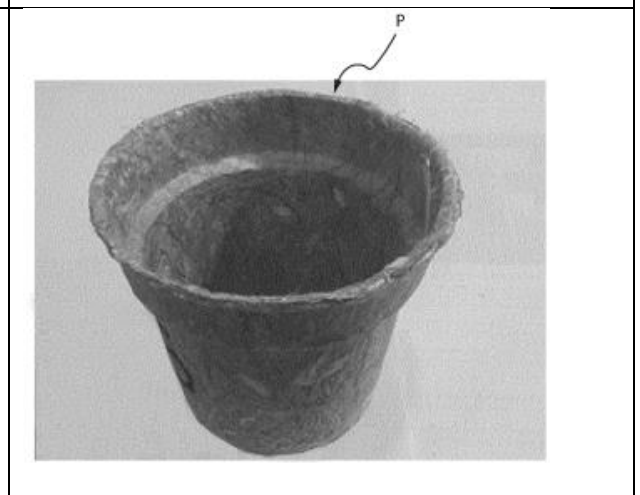
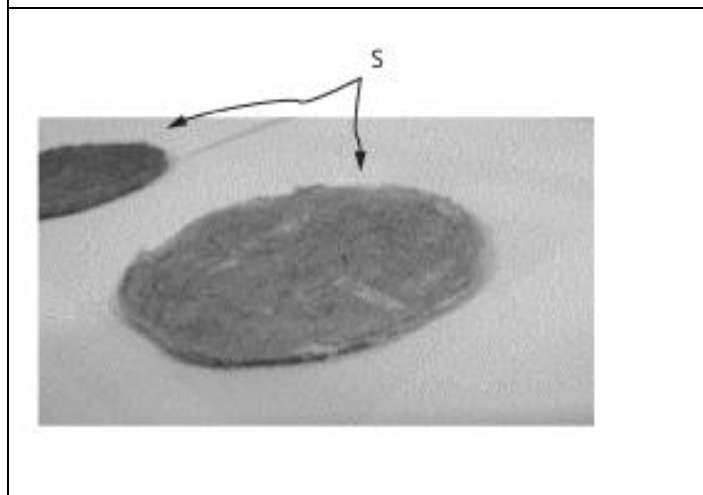
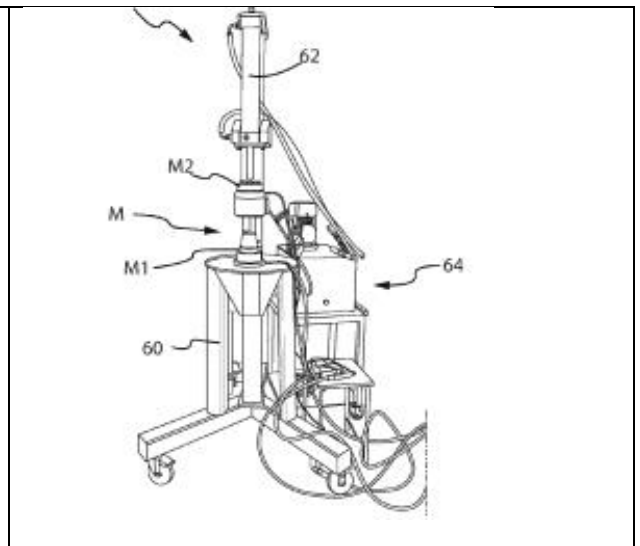
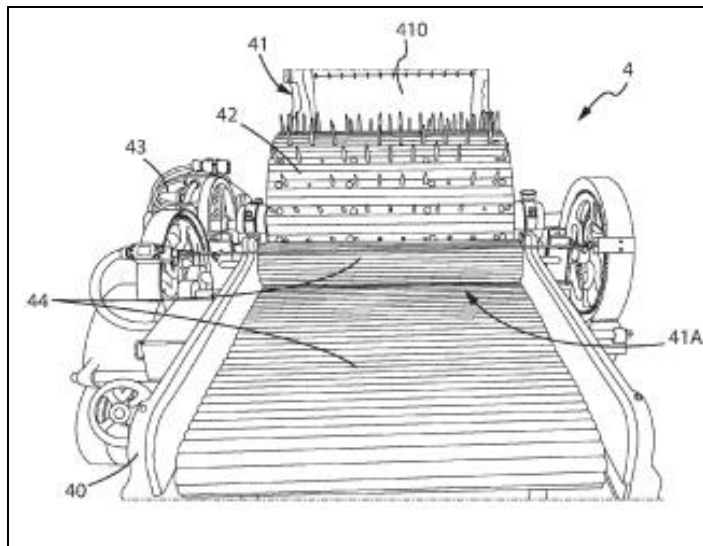
Publication date: 2024-08-14

Applicant(s): TETI GIAMPAOLO

Inventor(s): TETI GIAMPAOLO

Summary

Method for the production of a semi-finished product (S) starting from hemp plants comprising fibre and hemp shives. Said method comprising the following successive steps:- creating a shapeless vegetable mass comprising fibre and hemp shives starting from hemp plant biomass;- executing a first selection phase on said shapeless vegetable mass, thereby obtaining a first product having a lower hemp shives percentage than said shapeless vegetable mass;- creating a nonwoven mat or felt having a known or desired thickness starting from at least said first product;- distributing at least one glueing agent in said mat or felt, thereby obtaining a basic product;- applying heat and pressure to said basic product, thereby obtaining said semi-finished product (S).



Double-sided constant temperature fabric and preparation method therefor

Patent number: EP4215657

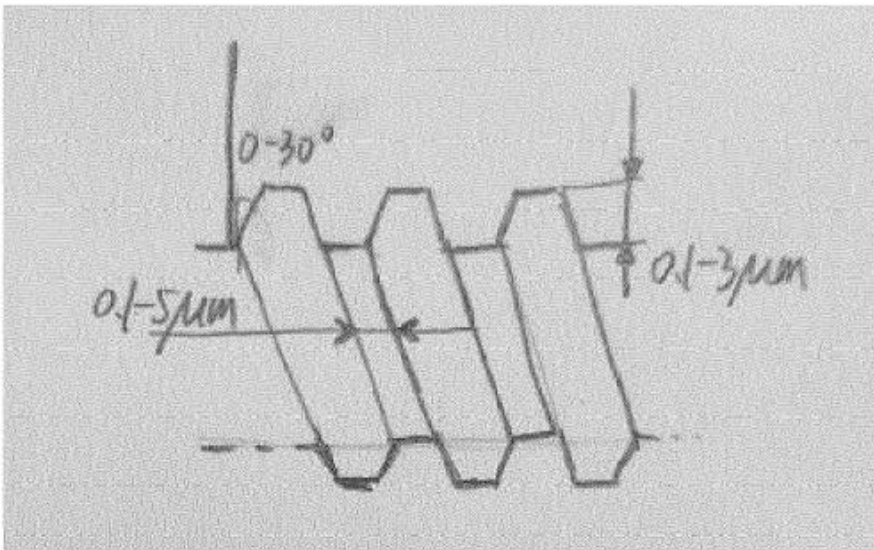
Publication date: 2023-07-26

Applicant(s): YANG YAN

Inventor(s): YANG YAN; YANG TAO

Summary

The present application provides a double sided thermostatic fabric and preparation method thereof, including: preparing a fiber with reflective and thermal insulation function (i.e. a second fiber), and using laser etching fiber surface to make threaded fiber, so that it has excellent light reflection and heat reflection properties, the fiber with reflective and thermal insulation function being an outer layer of the fabric; preparing a modified hemp fiber with excellent unidirectional moisture conductivity and thermal conductivity, the modified hemp fiber being an inner layer of the fabric; the inner layer of fabric is combined with the outer layer of the fabric to form a double sided fabric. The present application modifies the surface structure of the fiber and modifies the fiber, so that the prepared fabric can achieve temperature reduction through radiation heat dissipation and unidirectional moisture conduction in hot weather, and achieve thermal insulation through thermal reflection in cold weather, which can be applied to the manufacturing of clothing for human body temperature control, and has the advantages of large-scale batch preparation, low cost and high production efficiency.



	Initial temperature (°C)	15 min temperature (°C)	30 min temperature (°C)
Example	50.0	41.5	34.6
Comparative example 1	50.0	36.4	29.2
Comparative example 2	50.0	38.5	31.0
Comparative example 3	50.0	37.0	30.5
Comparative example 4	50.0	40.8	34.0
Comparative example 5	50.0	39.3	33.7

Nanocomposite hemp

Patent number: US10494501

Publication date: 2019-12-03

Applicant(s): Thomas Jefferson University

Inventor(s): KANDER RONALD

Summary

A composite material comprising a polymer and a carbonized hemp filler, wherein the carbonized hemp filler is produced by carbonizing hemp at a temperature of at least 1100 C to produce a char; and milling the char to produce a particle size, wherein the filler comprises 95% of particles of less than 10 microns in size; and wherein the hemp filler comprises between 1 and 50% of the total mass of the composite.

