

## US2017202309 - Three-dimensional printing of a traced element

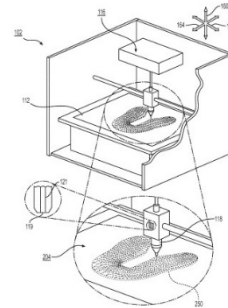
NIKE

Published 2017-07-20

A method of forming a traced element is disclosed.

The method may include printing layers of a traced element and incorporating a textile strand in overlapping polymer layers of the traced element. In some embodiments, the traced element may be formed on a base layer.

The traced element may be incorporated into an upper for an article of footwear.



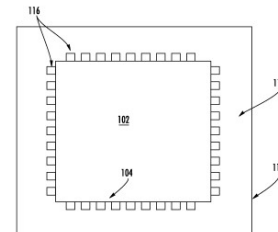
## EP3218169 - Method for counteracting stresses during 3d printing

3D SYSTEMS

Published 2017-09-20

Methods of 3D printing an object with reduced curl on at least one surface that contacts a print plate are described herein.

For example, in some embodiments, a method of 3D printing an object comprises depositing build material to form a first layer of a 3D printed object (102) and depositing build material in a predetermined pattern to form a first layer of a skirt (110) in contact with the 3D printed object.



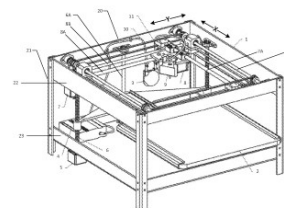
Depositing build material to form the first layer of the skirt comprises 3D printing a first layer of a sidewalk (112) that substantially surrounds at least a portion of a perimeter of the 3D printed object and 3D printing a first layer of a perforated interface (104) between the sidewalk and the perimeter of the skirt.

## EP3224052 - Printing device

RYONET

Published 2017-10-04

Systems and methods for garment decoration utilizing a printing apparatus having a print table configured to receive a print substrate, such as a fabric or transfer sheet, a print head to eject ink onto said print substrate, and a plurality of axes for multi-directional movement for two and three dimensional printing.



The printing apparatus further includes a curing unit for simultaneous printing and curing.

## US2017281367 - 3d-printed unibody mesh structures for breast prosthesis and methods of making same

### 3DB RESOURCES

Published 2017-10-05

A breast prosthesis device and method for making same are disclosed.

The prosthesis has an inner wall mesh having a first density.

The inner wall mesh is configured to align with a chest wall of the user.

The prosthesis has an outer wall mesh having a second density.

The outer wall mesh configured to have an ideal shape for the user.

The prosthesis may also have a band with a density greater or equal to the inner and outer wall meshes.

The prosthesis has a central portion disposed in between the inner and outer wall meshes.

The prosthesis can be generated using 3D scans of the user manipulated such that the resulting structure mimics human tissue.



## EP3229631 - Portable manufacturing system for articles of footwear

### NIKE

Published 2017-10-18

A portable manufacturing system (100) includes an additive manufacturing device (212) and a braiding device (222).

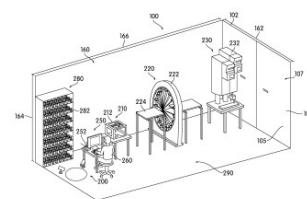
The system also includes systems for capturing customized foot information from a foot.

The additive manufacturing device can be used to form a footwear last having a geometry corresponding to the customized foot information.

The footwear last can be placed through the braiding device to form a braided component for an article of footwear.

A welding device (232) can be used to attach overlay components to the braided component.

Sole components may be separately formed and attached to the braided component.



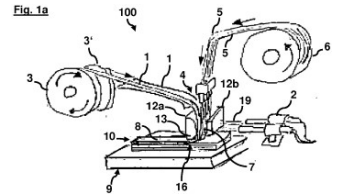
## EP3219474 - Method and device for 3d-printing a fiber reinforced composite component by tape-laying

*AIRBUS OPERATIONS*

Published 2017-09-20

A 3D-printing or tape laying method for manufacturing a fiber reinforced composite component (10).

The method comprises supplying a spread tow tape (1) containing a plurality of reinforcing fibers (2) from a tape supply (3) to a merging station (4), supplying a plurality of matrix material filaments (5) from a multi-filament supply (6) to the merging station (4), pressing together the plurality of matrix material filaments (5) with the spread tow tape (1) at the merging station (4), heating the spread tow tape (1) together with the plurality of matrix material filaments (5) at the merging station (4) to a melting temperature (T) of the matrix material filaments (5) to form an impregnated fiber ply (7), and depositing the impregnated fiber ply (7) in composite layers (8) onto a print bed (9) to form the fiber reinforced composite component (10).



A 3D-printer (100) or tape-laying machine implementing such a method.

## US2017238659 - Method of manufacturing spray-on footwear

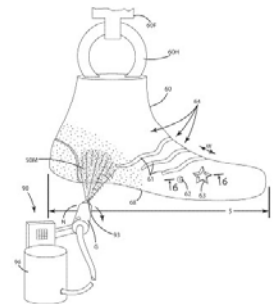
*WOLVERINE OUTDOORS*

Published 2017-08-24

A method is provided for making footwear utilizing a spray-on material.

The method can include spraying a spray-on fabric onto surfaces of a three dimensional last.

The last can be produced using additive manufacturing techniques, such as 3D printing, based on data corresponding to dimensions and contours of a consumer's foot, and/or preselected aesthetic footwear designs.



The spray-on fabric is sprayed onto the surfaces of the last and allowed to cure to form a flexible, non-woven fabric upper.

The upper can be removed from the last and turned inside out.

With the upper turned inside out, a sole can be joined to the fabric upper to form the footwear.

## WO2017079445 - Stretchable electroluminescent devices and methods of making and using same

CORNELL UNIVERSITY

Published 2017-05-11

A light emitting capacitor can include a first and second electrode, an electroluminescent layer, and at least one elastomeric layer.

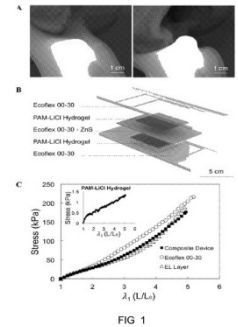
The electroluminescent layer, which can include an elastomeric material doped with semiconducting nanoparticles, can be disposed between the first and second electrodes.

The elastomeric layer can encapsulate the first electrode, second electrode, and electroluminescent layer.

The first and second electrodes can be hydrogel or conductive electrodes.

The light emitting capacitor can provide dynamic coloration or sensory feedback.

The light emitting capacitor can be used in, for example, robotics, wearables (displays, sensors, textiles), and fashion.



## US2017124747 - Synthetically fabricated and custom fitted dressware

KNOWLTON EDWARD (Inventor)

Published 2017-05-04

Embodiments are configured for capturing digital data representing skin of a subject.

An avatar representing the skin is generated from the digital data.

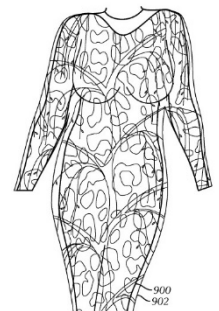
An enhanced avatar is generated by digitally revising a contour of the skin of the body.

A digital garment configured to enhance contours of the skin of the body is rendered from the enhanced avatar.

The digital garment comprises material having numerous zones, and each zone is configured with material comprising a contouring force and/or a pigment pattern corresponding to a region of the skin corresponding to the zone.

A corrective garment is generated from the digital garment, and the corrective garment is configured for wear to cover one or more regions of the skin of the body.

The corrective garment is configured to aesthetically enhance the body.



## US2017050384 - Printed scaffold structure for hybrid composites

FLY DAVID E (Inventor)

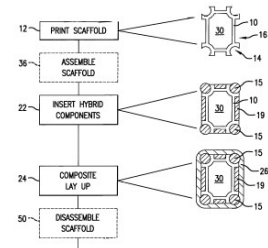
Published 2017-02-23

The present invention provides a 3-D printed scaffold tailored to a particular hybrid composite material to receive the reinforcement components and support them during application of a secondary composite material.

The printed scaffold may provide for retention features that locate and hold the reinforcement components in a variety of different configurations and may incorporate a microstructure having vacuum diffusion properties to assist in composite material lay-up.

The invention contemplates either that the scaffold may be sacrificial (retained in hybrid composite) or constructed to permit disassembly and reuse.

The 3D printed scaffold may also provide shapes or profile surfaces serving as layup forms that give shape to the woven fiber mat during assembly.

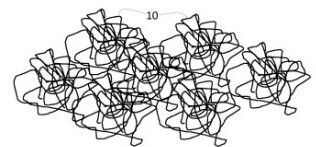


## US2016369125 - Thermoset composite having thermoplastic characteristics

UT BATTELLE

Published 2016-12-22

A composite composition includes a thermoset resin and about 3 wt. % to about 35 wt. % of at least one material selected from the group consisting of cellulose nanofibrils (CNF), micro-sized cellulose fibers (MFC), and cellulose nanocrystals (CNC) dispersed therein as measured with respect to the overall weight of the composite composition.



The cellulose nanofibrils and/or nanocrystals have an average diameter of about 5 nm to about 500 nm and an average aspect ratio in the range of about 5:1 to about 500:1.

The cellulose micro-sized fibers have an average diameter of about 5  $\mu\text{m}$  to about 100  $\mu\text{m}$  and an average aspect ratio in the range of about 5:1 to about 250:1.

## EP3253819 - Antimicrobial material comprising synergistic combinations of metal oxides

ARGAMAN TECHNOLOGIES

Published 2017-12-13

The present invention relates to materials having antimicrobial properties, said materials comprising a polymer having incorporated therein a synergistic combination of at least two metal oxide powders, comprising a mixed oxidation state oxide of a first metal and a single oxidation state oxide of a second metal, the powders being incorporated substantially uniformly within said polymer, wherein the powders have substantially different specific gravities and substantially similar bulk densities and wherein the ions of the metal powders are in ionic contact upon exposure of said material to moisture.

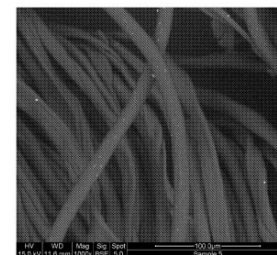


Figure 1A

There are further provided methods for the preparation of said materials and uses thereof, including in combating or inhibiting the activity of microbes or microorganisms.

## US2017015822 - Nanocellulose-polystyrene composites

API INTELLECTUAL PROPERTY HOLDINGS

Published 2017-01-19

A new polystyrene-nanocellulose composite material is disclosed.

The composite may contain about 0.01 wt % to about 10 wt %, such as about 0.1 wt % to about 2 wt % of nanocellulose.

In some embodiments, the nanocellulose is lignin-coated nanocellulose, such as lignin-coated nanocellulose is obtained from an AVAP® biomass-fractionation process.

The nanocellulose may include cellulose nanocrystals and/or cellulose nanofibrils.

The polymer composite may be in the form of a polymer melt, or a finished polymer material.

The composite is characterized by IZOD impact resistance that is at least 50% (such as 75% or more) higher compared to the polystyrene alone.

## WO2017134424 - A composition

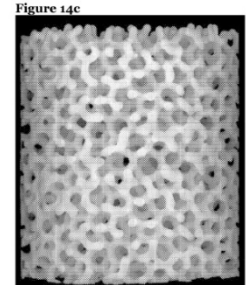
UNIVERSITY OF SURREY

Published 2017-08-10

The invention provides a composition comprising a three-dimensional amorphous trivalent network which reduces the number of modes within a particular frequency range ( $\omega c \pm \Delta\omega$ ).

The invention also extends to use of the composition as a structural colouration material and a paint, dye or fabric comprising the structural colouration material.

Additionally, the invention extends to use of the composition as an optical filter or as a supporting matrix configured to define at least one optical component, such as a frequency filter, light-guiding structure for a telecommunications application, an optical computer chip, an optical micro-circuit or a laser comprising the supporting matrix.



## EP3068252 - Article with coloring layer and control surface layer

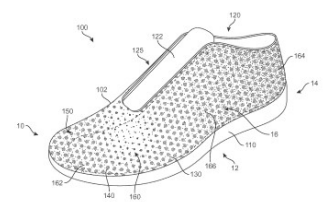
NIKE

Published 2016-09-21

An article, such as an article of footwear or an article of apparel, includes an upper having a gradient-like coloring pattern.

The article further includes protruding elements configured in a pattern that corresponds to the coloring pattern.

The article may have a layered structure including a base layer, a coloring ink layer and a layer of protruding elements.



## EP3261826 - Composite product and method

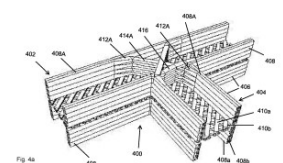
PRINTED STRUCTURES

Published 2018-01-03

A fibre reinforced composite product can be made by first forming a scaffold structure (400) with a set of tubes (408) running within the product interior, using a digital printing process.

Using a carrier fluid, the tube lumens are invested with fibres and then matrix material.

The carrier fluid may enter through the end of a tube connecting with an input manifold (920) and exit the tube radially via a capillary (904, 908) which runs alongside the tube.



## US9817440 - Garments having stretchable and conductive ink

L I F

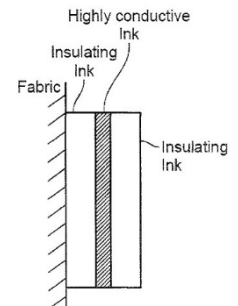
Published 2017-11-14

Methods of forming garments having one or more stretchable conductive ink patterns.

Described herein are method of making garments (including compression garments) having one or more highly stretchable conductive ink pattern formed of a composite of an insulative adhesive, a conductive ink, and an intermediate gradient zone between the adhesive and conductive ink.

The conductive ink typically includes between about 40-60% conductive particles, between about 30-50% binder; between about 3-7% solvent; and between about 3-7% thickener.

The stretchable conductive ink patterns may be stretched more than twice their length without breaking or rupturing.



## US9873803 - Dry ink for digital printing

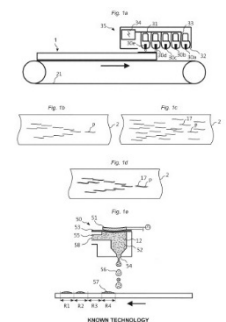
CERALOC INNOVATION

Published 2018-01-23

Pigment based particles in powder form intended to be used as colorants in a digital print formed by applying dry colorants on a surface, bonding a part of the colorants with a binder and removing the non-bonded colorants from the surface.

A panel with a surface including a digitally formed print of macro colorants including a particle body and color pigments attached to the surface of the particle body is also described.

The colorants are arranged in patterns with pigments on an upper and lower surface of the particle body.



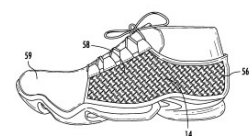
## EP2702884 - Articles of apparel including auxetic materials

UNDER ARMOUR

Published 2014-03-05

An article of apparel includes a base layer and an auxetic layer. The base layer includes a four way stretch material. The auxetic layer is coupled to the base layer and includes an auxetic structure defining a repeating pattern of voids.

In accordance with one exemplary embodiment of the disclosure, each void has a reentrant shape and is at least partially filled with a foam or a hot melt material.





## EP2855132 - Multicomponent optical device having a space

CRT TECHNOLOGY

Published 2015-04-08

The present disclosure relates generally to multicomponent optical devices having a space within the device.

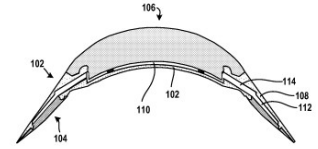
In various embodiments, an optical device comprises a first posterior component having an anterior surface, a posterior support component, and an anterior component having a posterior surface.

An optical device can also comprise an anterior skirt.

The first posterior component and the anterior skirt can comprise gas-permeable optical materials.

An optical device also comprises a primary space between the posterior surface and the anterior surface, with the primary space configured to permit diffusion of a gas from a perimeter of the primary space through the space and across the anterior surface of the first posterior component.

A method of forming a multicomponent optical device having a space is also provided.



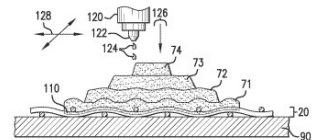
## EP2838708 - Direct printing to fabric

NIKE

Published 2015-02-25

Methods and systems are disclosed for three-dimensional printing directly onto an article of apparel.

Disclosed is a method and system for direct three-dimensional printing onto an article of apparel, including designing a three-dimensional pattern for printing onto the article, positioning at least a portion of the article on a tray in a three-dimensional printing system, the portion being positioned substantially flat on the tray, printing a three-dimensional material directly onto the article using the designed pattern, curing the printed material, and removing the article from the three-dimensional printing system.



## EP2977205 - Method of providing an article of apparel

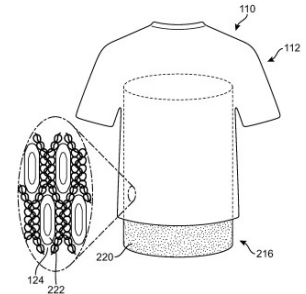
NIKE

Published 2016-01-27

A method of providing an article of apparel is provided.

The article of apparel can include a tubular knit textile having an internal side and an opposite external side configured to be exposed during use, a plurality of yarns in an arrangement of interlocked loops forming parallel rows and channels therebetween, and a printed ink design on its external side.

The printed ink design can be formed from ink applied to the parallel rows of loops and to the channels.



## EP3094197 - Body surfing suit

GADLER NICHOLAS

Published 2017-10-18

Apparatus and methods for body surfing which provide the body surfer a means to stabilize his ride and control his direction/position on a wave are described herein.

According to one aspect, a body surfing apparatus includes a body suit having a torso, arms, and legs; a plurality of fins located on the torso; a plurality of fins located on the arms; and one or more fins located laterally on the legs.

The fins are preferably attached to the body suit via an adhesive or mechanical means and the fins and suit may include a buoyant layer.

In one embodiment, the body surfing apparatus includes a body suit with multiple segmentations and/or fins with multiple sliced cuts.

