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Atty. Dkt.: BHD-4662-3302

Date: October 28, 2016

Attached for filing is the **UTILITY** patent application of:
First Named Inventor: SIMMELINK, Joseph A.
Entitled: COLORED SUTURE
including the attachments as noted below:

Application and Signed Documents
11 pages of Specification, Claims and Abstract (including 9 numbered claims)
sheets of Drawing(s) (Figures -)
☐ Declaration ☐ Combined Declaration and Assignment (submitted via EPAS) ☐ Verified Translation of Declaration
☐ Newly executed; ☐ A copy from a prior application (37 CFR 1.63(d))
☐ Assignment and Recordation Form Cover Sheet (paper filing) ☐ Assignment (submitted via EPAS)
☒ Power of Attorney ☒ 37 CFR 3.73(b) or 37 CFR 3.73(c) Statement ☐ General Power of Attorney Transmittal Letter
☒ Application Data Sheet
☐ English Translation

Priority Claim (Domestic and/or Foreign) (**must** be included in Application Data Sheet)
☐ Provisional/Nonprovisional Application(s) are identified in attached Application Data Sheet
☒ Continuation/Division/Continuation-In-Part parent application(s) are identified in attached Application Data Sheet
☐ PCT/foreign application(s) is/are identified in attached Application Data Sheet
☐ Incorporation by Reference statement is in the specification or Preliminary Amendment
☒ Copy the incorporation by reference from the specification or Preliminary Amendment and insert text here:

This application is a continuation of copending US Application Serial No. 12/599,869, filed January 14, 2010, (now U.S. Patent No. _____), which is the national phase application of international application PCT/EP2008/004135, filed May 23, 2008, which designated the US and claims priority to European Application No. 07010217.3, filed May 23, 2007, the entire contents of each of which are hereby incorporated by reference.

Certified Copy/Copies
☐ Certified copy(ies) of foreign application(s) attached
☐ Certified copy(ies) filed on in prior Application No. filed
☐ Interim copy(ies) of priority document(s) (effective March 16, 2013)
☐ Request to Retrieve Electronic Priority Application(s) (for a non-EPO priority doc that is of record in an EPO application or a non-JPO priority document that is of record in a JPO application)

Prior U.S. Application(s)
☐ Request under 37 CFR 1.48(a) to delete inventor(s) named in prior application
☐ Petition filed in prior application to extend its life to ensure co-pendency of parent application

Preliminary Amendment
☐ Preliminary Amendment (Please enter the attached Preliminary Amendment prior to calculation of claims fees.)

Information Disclosure Statement
☐ Information Disclosure Statement (IDS) and Form(s) PTO/SB/08
☐ Copies of newly cited publications, other than U.S. patents and U.S. patent application publications, are attached
☐ English language and/or "concise explanation" is/was provided for each foreign language document
☒ Form(s) PTO/SB/08 listing the references cited in the parent application(s) (for continuing cases)

Other Documents
☐ Non-Publication Request
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☐ Authorization to Permit Access to Search Results by the European Patent Office (EPO) (Form PTO/SB/69)
☐ Other (itemize each attachment):

Small Entity

☐ Applicant claims "small entity" status. ☐ "Small entity" statement(s) attached

Micro Entity

☐ Applicant claims "micro entity" status. ☐ Micro entity certification statement filed herewith.

Fee Calculation

Utility Basic Filing Fee					$280.00 (1011)/$140.00 (2011)/$70.00 (3011) $70.00 (4011)	$	280.00
Utility Search Fee					$600.00 (1111)/$300.00 (2111)/$150.00 (3111)	$	600.00
Utility Examination Fee					$720.00 (1311)/$360.00 (2311)/$180.00 (3311)	$	720.00
Utility Application Size Fee ($400.00 (1081)/$200.00 (2081)/$100.00 (3081))for each additional 50 pages that exceeds 100 pages):							
Paper filing: Total pages:	-100 = 0	=	0	$0.00 (1081)	/$0.00 (2081)/$0.00 (3081)	$	
Surcharge for Paper Filing					$400.00 (1090)/$200.00 (2090)/$200.00 (3090) (1090)/$0.00 (2090)/$0.00 (3090)	$	
E-filing:				$0.00(1081)	/$0.00 (2081)/$0.00 (3081)	$	
Total pages:	*.75 = 0–100 = 0/50	=	0				
Total effective claims	9 - 20 (at least 20) =	0	x $80.00	= $0.00 (1202)/$0.00 (2202)/$0.00 (3202)		$	
Independent claims	1 - 3 (at least 3) =	0	x$420.00	= $0.00 (1201)/$0.00 (2201)/$0.00 (3201)		$	
If any proper multiple dependent claims now added for first time, add $780.00 (1203)/$390.00 (2203)/$195.00 (3203) (ignore improper)						$	
Assignment Recording Fee				$40.00 (8021) /**$0 if filed electronically**		$	
Prepayment of Surcharge for Late Declaration				$140.00 (1051)/$70.00 (2051)/$35.00 (3051)		$	140.00
English translation of specification and claims				$140.00 (1053)/$70.00 (2053)/$35.00 (3053)		$	
					TOTAL FEE	**$**	**1,740.00**

☒ CREDIT CARD OR DEPOSIT ACCOUNT PAYMENT (CREDIT CARD FORM ATTACHED IF PAPER FILING).

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COLORED SUTURE

This application is a continuation of copending US Application Serial No. 12/599,869, filed January 14, 2010 (now U.S. Patent No. _____), which is the national phase application of international application PCT/EP2008/004135, filed May 23, 2008, which designated the US and claims priority to European Application No. 07010217.3, filed May 23, 2007, the entire contents of each of which are hereby incorporated by reference.

The invention relates to a colored suture. The coloring of sutures is for example used to make the suture better contrast with the blood or tissue in the operating area. In complicated surgical operations, for example in arthroscopic surgery, when different suture ends are used in a small area, sutures of different color are used to assist surgeons in differing between the suture ends. It is also possible for this reason to combine filaments of different colors in a suture in a certain pattern, to aid surgeons in identifying the travel direction of the suture during surgery, particularly during arthroscopic operations.

Next to coloring is also suture strength an important consideration in selecting filaments for producing a suture. Very strong filaments, at present available for the production of sutures, are filaments of ultra-high molecular weight polyethylene (UHMwPE), produced according to the gel spinning process.

A problem of such filaments is that they are difficult to color. Due to the a-polar character of the UHMwPE a colorant like a dye or a colored coating material adheres poorly to the surface of the filament. If adhesion is insufficient the filaments may loose part or all of the colorant because of the handling during production of the sutures, or may loose part of the colorant in place in the human or animal body, which is undesired because of negative effects on the health. Attempts have been made to enhance the adhesion of colorants to the filaments by giving the filaments a pre-treatment, for example a plasma treatment. Such pre-treatments in general however have an adverse effect on the mechanical properties of the filaments, like for instance the tensile strength and often don't improve adhesion enough to make the filaments suitable to be used in sutures.

In another attempt filaments of UHMwPE were dyed using super critical carbon dioxide as a solvent for the dye, as disclosed in EP-A-0 873 445. In this case the dye penetrated in the body of the filament, so that adhesion problems did no longer play a role. However such a dye shows a tendency to leach out, which is unfavorable for application of the filaments in sutures. Also in US-5,613,987 it was proposed to use a dye to color the UHMwPE filaments. Here the same problems occur.

Polyolefinic filaments, of which polypropylene filaments are the best example, are often colored by the incorporation of a pigment in the polymer composition of the filaments during extrusion of the filaments. In Prog. Polym. Sci. 27 (2002) 853-913 the process for pigmentation of polypropylene filaments is described.

The pigments are in a first step uniformly dispersed in a so-called carrier polymer to obtain a concentrated pre-mixture. In order to obtain a sufficient dispersion of the pigment the wetting of the pigment particles must be enhanced by the use of a low viscous carrier polymer and dispersants. A low viscous carrier polymer has a negative influence on mechanical properties of the UHMwPE filaments. Furthermore such filaments have a very low diameter compared to the diameter of polypropylene filaments, so that un-dispersed or re-agglomerated clumps of pigment particles will have a detrimental effect on the tensile strength of the filaments. Therefore it is disadvised in US 5,613,987 to use pigments in UHMwPE filaments. Also the use of dispersants in filaments that are used in sutures is disadvantages, because such filaments must be biocompatible and dispersants have a negative effect on that.

One solution proposed to overcome the problems of the coloring of filaments of UHMwPE is to combine the filaments in a suture with filaments of a different polymer, preferably nylon, as disclosed in US-7,029,490. Such sutures however have a complicated structure and the nylon filaments only contribute to the strength of the suture at a lower level compared to the filaments of UHMwPE.

Object of the invention is to provide a colored suture, which suture does not show the problems described above.

Surprisingly such a suture is obtained if the suture contains a multi-filament yarn that is obtained by a process comprising the steps of:

a) Providing a mixture containing UHMwPE , a spinning solvent and a pigment
b) Spinning a multi-filament yarn from the mixture by the gel spinning process.

The preparation of filaments of ultra high molecular weight polyethylene (UHMWPE) filaments, prepared by a gel spinning process, is for example described in EP 0205960 A, EP 0213208 A1, US 4413110, GB 2042414 A, EP 0200547 B1, EP 0472114 B1, WO 01/73173 A1, and Advanced Fiber Spinning Technology, Ed. T. Nakajima, Woodhead Publ. Ltd (1994), ISBN 1-855-73182-7, and references cited therein. Gel spinning is understood to include at least the steps of spinning filaments from a solution of ultra-high molecular weight polyethylene in a spin solvent; cooling the filament obtained to form a gel filament; removing at least partly the spin solvent from the gel filament; and drawing the filament in at least one drawing step before, during or after removing spin solvent. Suitable spin solvents include for example paraffin's, mineral oil, kerosene or decalin. Spin solvent can be removed by evaporation, by extraction, or by a combination of evaporation and extraction routes. Such filaments are commercially available as Spectra® or Dyneema® grades.

Good results are obtained if the UHMWPE has an intrinsic viscosity (IV, as determined according to method PTC-179 (Hercules Inc. Rev. Apr. 29, 1982) at 135°C in decalin, with dissolution time of 16 hours, with anti-oxidant DBPC in an amount of 2 g/l solution, and the viscosity at different concentrations extrapolated to zero concentration) of above 5 dl/g. Particularly suitable is UHMWPE with IV of between about 8 and 40 dl/g, more preferably between 10 and 30, even more preferably between 12 and 28, most preferably between 15 and 25 dl/g. These ranges represent an optimum in polymer processability and filament properties. Intrinsic viscosity is a measure for molar mass (also called molecular weight) that can more easily be determined than actual molar mass parameters like M_n and M_w. There are several empirical relations between IV and M_w, but such relation is highly dependent on molar mass distribution. Based on the equation $M_w = 5.37 \times 10^4 [IV]^{1.37}$ (see EP 0504954 A1) an IV of 8 dl/g would be equivalent to Mw of about 930 kg/mol.

Preferably, the UHMWPE is a linear polyethylene with less than one branch per 100 carbon atoms, and preferably less than one side chain per 300 carbon atoms, a branch usually containing at least 10 carbon atoms. The linear polyethylene may further contain up to 5 mol% of one or more comonomers, such as alkenes like propylene, butene, pentene, 4-methylpentene or octene.

In a preferred embodiment, the UHMWPE contains a small amount of relatively small groups as side chains, preferably a C1-C4 alkyl group. It is found that a filament from UHMWPE with a certain amount of such groups show reduced creep behaviour. Too large a side chain, or too high an amount of side chains, however, negatively affects the processing and especially the drawing behaviour of the filaments. For this reason, the UHMWPE preferably contains methyl or ethyl side chains, more preferably methyl side chains. The UHMWPE therefore contains preferably at least 0.2, more preferably at least, still more preferably at least 0.3, still more preferably at least 0.4, most preferably at least 0.5 methyl or ethyl side chains. The amount of side chains is preferably at most 20, more preferably at most 10 per 1000 carbon atoms.

The UHMwPE can be a single polymer grade, but also a mixture of two or more different grades, e.g. differing in IV or molar mass distribution, and/or number of side chains. Preferably the polymeric part of the filaments is a single grade UHMwPE.

The number of filaments in the multi-filament yarn may be between 10 and 1000. Preferably the number of filaments in the multi-filament yarn is more than 20, more preferably more than 30.

The mixture containing the UHMwPE, the spinning solvent and the pigment may be provided at different stages in the gel spinning process. It is for example possible to produce in a first step a dry mixture of UHMwPE powder and the pigment, to produce in a second step a slurry of that mixture in a spinning solvent, to dissolve the UHMwPE in the spinning solvent in a third step to obtain a slurry of the pigment in a solution of UHMwPE in the spinning solvent and to spin the multi-filament yarn from that solution. It is also possible to produce a solution of UHMwPE in the spinning solvent first and to add the pigment to that solution.

The UHMwPE filaments preferably contain less than 800 ppm of residual amounts of spin solvent, more preferably less than 500, even more preferably less than 250, most preferably less than 100 ppm, such as less than 80 ppm, or less than 60 ppm. Filaments and suture with low residual amount of spin solvent is highly advantageous in being more suitable for implantation.

Suitable pigments include organic and inorganic pigments. Examples of organic pigments include azo-pigments and phtalo-pigments. Good results are obtained with C.I. Vat brown I and C.I. Solvent Yellow 18. Examples of inorganic pigments include pigments containing titanium dioxide, iron oxides and chromium oxides. Good results are obtained with aluminium-chromium-cobalt oxide, since a suture with good mechanical properties and a low degree of leaching out is obtained.

The amount of pigment used may be between 0.1 – 7 wt.% of the final filament, as used for the production of the suture. Preferably the final filament contains at least 0.3 wt.%, more preferably at least 0.5 wt.% even more preferably at least 0.7 wt.% of pigment. Preferably the final filament contains at most 5.0 wt.%, more preferably at most 3 wt.% of pigment, even more preferably at least 2.5 wt.%, most preferably at most 2 wt.%. This is in view of obtaining a bright colour and good mechanical properties.

The UHMwPE filaments in the suture according to the invention consist preferably of UHMwPE, the pigment and less than 1000 ppm of further constituents, preferably less than 500 ppm of further constituents, more preferably less than 200 ppm of further constituents, most preferably less than 100 ppm of further constituents, such as less than 80 ppm, or less than 60 ppm.

A suitable size for the suture according to the invention may be in the full USP range for sutures (e.g. 12-0 to 10). A USP value of 10 corresponds with a maximum diameter of 1.3 mm. In one preferred embodiment the suture member has a titer of between 25 and 500 dtex. In that case the suture is very suitable for cardiovascular operations. In another preferred embodiment the suture has a titer of

between 500 and 3000 dtex. In that case the suture is very suitable for use in orthopaedic applications. In yet another preferred embodiment the suture has a titer of between 3000 and 9000 dtex. In that case the suture is very suitable to be used in heavy orthopaedic applications.

The suture may in addition to the ultra high molecular polyolefin filaments comprise further components, for example compounds that provide some functional effect, like anti-microbial or anti-inflammatory action, or that further improve knotting performance. The amount of such other components is generally limited to at most 20 mass% (relative to total cable mass), preferably at most 10, more preferably at most 5 mass%.

The suture according to the invention comprises preferably at least 50 mass% of the ultra high molecular weight polyolefin filaments. The ultra high molecular weight polyolefin filaments contribute most to the strength properties of the member. Furthermore the filaments enhance the sliding properties of the suture through tissue. Therefore more preferably the suture comprises at least 60 mass% of the ultra high molecular weight polyolefin filaments, more preferably at least 70, 80 or at least 90 mass%. The suture may further comprise other fibres, e.g. other biocompatible materials like polymers, to provide some other additional properties to the suture, including improved knot slip behaviour or visual contrast. Such other fibres may be present in the form of one or more strands in the suture. However, preferably each strand has the same composition, so that each strand comprises the same amount of the polyolefin filaments and of the other filaments. This ensures that the suture has a homogeneous structure.

Suitable examples of other fibrous materials include filaments or staple fibres made from non-absorbable polymers like other polyolefin's, fluoro-polymers, or semi-aromatic polyesters like polyethylene terephthalate, absorbable polymers like aliphatic polyesters based on e.g. lactides.

Most preferably the suture consists of the polyolefin filaments.

The invention also relates to the use of the suture according to the invention in surgical method.

The invention is further explained in the examples, without being limited to the examples.

Methods

Intrinsic viscosity.

The Intrinsic Viscosity (IV) is determined according to method PTC-179 (Hercules Inc. Rev. Apr. 29, 1982) at 135°C in decalin, the dissolution time being 16 hours, with DBPC as anti-oxidant in an amount of 2 g/l solution, by extrapolating the viscosity as measured at different concentrations to zero concentration;

Tensile properties.

Tensile properties: tenacity, tensile modulus (or modulus) and elongation at break (or eab) are defined and determined on multifilament yarns with a procedure in accordance with ASTM D885M, using a nominal gauge length of the fibre of 500 mm, a crosshead speed of 50%/min and Instron 2714 clamps, of type Fibre Grip D5618C. On the basis of the measured stress-strain curve the modulus is determined as the gradient between 0.3 and 1% strain. For calculation of the modulus and strength, the tensile forces measured are divided by the titre, as determined by weighing 10 metres of fibre; values in GPa are calculated assuming a density of 0.97 g/cm^3;

Leaching tests

According to the requirements of ISO 10993-12:2002(E) an extraction was performed with samples of multi-filament yarn in both polar (distilled water) and non-polar (cottonseed oil) solvents. The extraction conditions were 37 °C for 24 and 72 hours.

After dilution with acetonitrile, the different phases were analyzed on the presence of pigment using Liquid Chromatography-Mass Spectrometry (LC-MS) and Gas Chromatography-Mass Spectrometry (GC-MS). In case no leaching I was observed means that leaching was lower than 10 ppb.

Cytotoxicity.

Cytotoxicity tests were performed according to ISO 10993-5, 1999: Biological Evaluation of Medical Devices – Part 5: Tests for in vitro cytotoxicity. The biological reactivity of a mammalian monolayer, L929 mouse fibroblast cell culture, in response to the test item extracts (samples containing up to 2.0 wt.% pigment) was determined. Extracts were prepared at 37°C (± 1) for 24 hours in a humidified atmosphere containing 5±1% CO_2. Positive (natural rubber) and negative (silicone) control articles were prepared to verify the proper functioning of the test system. The

maintenance medium of the cell cultures was replaced by the extracts of the tests item or control article in triplicate and the cultures incubated for 48 hours, at 37℃ (± 1). Biological reactivity was rated on the following scale:

- grade 0 (no reactivity)
- grade 1 (slight reactivity)
- grade 2 (mild reactivity)
- grade 3 (moderate reactivity)
- grade 4 (severe reactivity)

Examples 1 – 4.

Slurries containing decalin, 6 mass % of powder of UHMwPE having an IV of 14 and 0.5, 1, 1.5 respectively 2 wt. % of aluminum-chromium-cobalt oxide pigment (of the cations is 32.5 % Co, 32% Al and 35.5 Cr) were prepared in a mixer.

The slurries were fed to a twin screw extruder having a diameter of 25 mm, being equipped with a gear-pump at a temperature setting of 180°C. In the extruder the UHMwPE was dissolved in the decalin and the so obtained mixture of the UHMwPE dissolved in the decalin and the pigment was extruded through a spin plate having 24 spin holes into a nitrogen atmosphere with a rate of 1.0 g/min per hole. The so obtained solution filaments were cooled in a water bath kept at about 35°C and with a water flow rate of about 5 cm/s perpendicular to the filaments entering the bath, and taken-up at such rate that a draw ratio of 15 was applied to the as-spun filaments in the air-gap of 15 mm. The filaments subsequently entered an oven at 130°C. The filaments were further stretched, during which process the decalin evaporated from the filaments. After the stretching process the filaments were kept taut in an oxygen free environment for 24 hours at 100 ℃.

Mechanical properties, leaching out and cytotoxicity were determined on the so obtained multi-filament yarns.

The mechanical properties are reported in table 1. Favourable mechanical properties were obtained.

No compounds related to pigment, or other unknown compounds, where found. The pigment < 10 µg/kg (< 10 ppb).

From these results it can be concluded that the bio-availability of pigment due to leaching from sutures according to the invention containing the multi-filament yarn is negligible.

All the extracts of the colored samples when submitted to the cytotoxicity test exhibited no reactivity (grade 0) by the cell cultures. Severe reactivity

(grade 4) was observed for the positive control article. The negative control article showed no signs of reactivity (grade 0). Therefore it can be concluded that sutures according to the invention containing the multi-filament yarn are non-cytotoxic.

The yarns furthermore show a homogeneous and bright colour.

Comparative test A.

Multi-filament yarn was produced according to examples 1-4, however no pigment was used.

The multi-filament yarn was dyed with D&C blue No 6 (delivered by Sigma Aldrich of the USA) by placing the multi-filament yarn for 7 hours at 120°C in a solution of the dye in super-critical carbon dioxide.

The resulting yarns presented a non-homogeneous color distribution pattern.

Mechanical properties and leaching out were determined.

Mechanical properties are reported in table 1. A serious decline in mechanical properties was observed (tenacity decreased about 40%).

Considerable leaching out took place in coconut oil as was already clear from the disappearing color of the multi-filament yarn.

From these results it is clear that sutures containing the multi-filament yarn according to comparative test A are not suitable for use in surgery.

Comparative test B.

Multi-filament yarn was produced according to examples 1-4, however no pigment was used.

The multi-filament yarn was dip-coated with a polyurethane coating containing an azo-dye (Sudan Red D, delivered by Sigma Aldrich).

Test data of the multi-filament yarn were measured and reported in table I. It is clear that considerable leaching out took place and that the cyto-toxicity of the filaments is insufficient. Therefore sutures containing the multi-filament yarn according to comparative test B are not suitable for use in surgery.

Table. 1.

Example/ Xomp. exp.	Tenacity [cN/dTex]	Modulus [cN/dTex]	Eab [%]	leaching [-]	cytotox. [-]	colouring [-]
I	37	1439	2.8	No	0	homogeneous
II	37	1377	2.9	No	0	Homogeneous
III	40	1501	3.0	No	0	Homogeneous
IV	37	1414	2.9	No	0	Homogeneous
A	21	-	-	Yes	-	Inhomogeneous
B	37	1381	2.8	Yes	-	Inhomogeneous

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CLAIMS

1. A colored multi-filament yarn comprising filaments that have been obtained by gel spinning a mixture containing ultra-high molecular weight polyethylene (UHMwPE) having an intrinsic viscosity (IV) of between about 8 and 40 dl/g, a spin solvent and a pigment, and wherein the filaments consist of UHMwPE, between 0.1 and 7.0 wt.% of an inorganic chromium oxide-containing pigment, a residual amount of spin solvent of less than about 500 ppm, and less than 1000 ppm of further constituents.
2. The multi-filament yarn according to claim 1, wherein the amount of the inorganic pigment present in the filaments is between 0.3 and 5.0 wt. %.
3. The multi-filament yarn according to claim 1, wherein the amount of the inorganic pigment present in the filaments is lower than 2.0 wt. %.
4. The multi-filament yarn according to claim 1, wherein the inorganic pigment is aluminum-chromium-cobalt oxide.
5. The multi-filament yarn according to claim 1, wherein the residual amount of spin solvent is less than 250 ppm.
6. The multi-filament yarn according to claim 1, wherein the residual amount of spin solvent is less than 100 ppm.
7. The multi-filament yarn according to claim 1, wherein the residual amount of spin solvent is less than 60 ppm.
8. The multi-filament yarn according to claim 1, wherein the filaments contain less than 500 ppm of further constituents.
9. The multi-filament yarn according to claim 1, wherein the number of filaments is between 10 and 1000.

ABSTRACT

Suture containing filaments of ultra-high molecular weight polyethylene (UHMwPE), characterized in that the suture contains a multi-filament yarn that is obtained by a process comprising the steps of:

a) Providing a mixture containing UHMwPE , a spinning solvent and a pigment
b) Spinning a multi-filament yarn from the mixture by the gel spinning process.

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BHD-4662-3302
	Application Number	
Title of Invention	COLORED SUTURE	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

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All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BHD-4662-3302
	Application Number	
Title of Invention	COLORED SUTURE	

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	23117		
Email Address	PatentMail@nixonvan.com	Add Email	Remove Email

Application Information:

Title of the Invention	COLORED SUTURE		
Attorney Docket Number	BHD-4662-3302	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)		**Suggested Figure for Publication (if any)**	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	23117		

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BHD-4662-3302
	Application Number	
Title of Invention	COLORED SUTURE	

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	12599869	2010-01-14
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12599869	a 371 of international	PCT/EP2008/004135	2008-05-23

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
07010217.3	EP	2007-05-23	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BHD-4662-3302
	Application Number	
Title of Invention	COLORED SUTURE	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BHD-4662-3302
	Application Number	
Title of Invention	COLORED SUTURE	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	DSM IP ASSETS B.V.		
Mailing Address Information For Applicant:			
Address 1	Het Overloon 1		
Address 2			
City	Heerlen	**State/Province**	
Country	NL	Postal Code	6411 TE
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BHD-4662-3302
	Application Number	
Title of Invention	COLORED SUTURE	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Bryan H. Davidson/			Date (YYYY-MM-DD)	2016-10-28
First Name	Bryan	Last Name	Davidson	Registration Number	30251

Additional Signature may be generated within this form by selecting the Add button. Add

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	BHD-4662-3302
	Application Number	
Title of Invention	COLORED SUTURE	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

HONEYWELL Ex. 1002, Page 21 of 112
HONEYWELL INTERNATIONAL INC. v. DSM IP ASSETS B.V.
IPR2024-00493

PTO/AIA/83 (07-12)
Approved for use through 11/30/2014. OMB 0651-0035
U.S. Patent and Trademark Office; U.S DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

☒ Practitioners associated with Customer Number: 23117

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

☒ The address associated with Customer Number: 23117

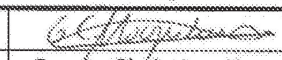
OR

☐	Firm or Individual Name			
	Address			
	City		State	Zip
	Country			
	Telephone		Email	

Assignee Name and Address: DSM IP ASSETS B.V.
Het Overloon 1
Heerlen, The Netherlands 6411 TE

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record
The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	08 December 2015
Name	Gerrie Christine Hoogendam	Telephone	+31(0)46477140
Title	Proxy		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

BHD-4662-3302

STATEMENT UNDER 37 CFR 3.73(c)

Applicant / Patent Owner: DSM IP Assets B.V.

Application No. / Patent No. Continuation of 12/599,869 Filed/Issue Date: October 28, 2016

Titled: COLORED SUTURE

DSM IP Assets B.V. (Name of Assignee) , a Corporation (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest in;

2. ☐ An assignee of less than the entire right, title, and interest in
   - ☐ The extent (by percentage) of its ownership interest is %. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
   - ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:
     Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 023783 , Frame 0563 , or for which a copy thereof is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: To:
   The document was recorded in the United States Patent and Trademark Office at
   Reel , Frame , or for which a copy thereof is attached.
2. From: To:
   The document was recorded in the United States Patent and Trademark Office at
   Reel , Frame , or for which a copy thereof is attached.
3. From: To:
   The document was recorded in the United States Patent and Trademark Office at
   Reel , Frame , or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 C.F.R. § 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 C.F.R. § 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Bryan H. Davidson/	October 28, 2016
Signature	Date
Bryan H. Davidson	30,251
Printed or Typed Name	Title or Registration Number

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	Conf. No.: **TBA**
SIMMELINK et al.	Atty. Dkt. No.: **BHD-4662-3302**
Serial No.: **Continuation of 12/599,869**	Art Unit: **TBA**
Filed: **October 28, 2016**	Examiner: **TBA**

For: **COLORED SUTURE**

* * * * * * * * * * * *

October 28, 2016

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBMISSION OF PTO/SB/08a

Sir:

Attached is a PTO/SB/08a listing the documents which were cited in parent application Serial No. 12/599,869 filed January 14, 2010. The Examiner is asked to initial, date and return a copy of the PTO/SB/08a evidencing consideration of the listed documents. Pursuant to Rule 98(d), copies of the listed US citations have not been provided.

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to Deposit Account No. 14-1140.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: /Bryan H. Davidson/
Bryan H. Davidson
Reg. No. 30,251

BHD:dlb
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

Sheet 1 of 1

INFORMATION DISCLOSURE CITATION

(Use several sheets if necessary)

ATTY. DOCKET NO. **BHD-4662-3302**

APPLICATION NO. **Continuation of 12/599,869**

INVENTOR(S) **SIMMELINK et al**

FILING DATE **October 28, 2016**

ART UNIT **TBA**

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		5,613,987	03/1997	Kuroki et al			
		2003/0050667	03/2003	Grafton et al			
		2008/0287990	11/2008	Smit			
		6,060,007	05/2000	Hutton et al			
		5,651,377	07/1997	O'Donnell, Jr.			
		2004/0267313	12/2004	Amery et al			
		2006/0263432	11/2006	Yano et al			
		2007/0154707	07/2007	Simmelink et al			
		2008/0004702	01/2008	Denoziere			
		2008/0124368	05/2008	Sarangapani			
		2009/0012251	01/2009	Dirks et al			
		2009/0048628	02/2009	Marissen			
		3,057,040	10/1962	Anthony			
		3,166,073	01/1965	Leonard			
		3,565,652	02/1971	Burnet			
		3,698,853	10/1972	Wilson			
		4,008,303	02/1977	Glick et al			
		5,373,911	12/1994	Throne et al			
		2005/0208096	09/2005	Shalaby			
		2006/0045899	03/2006	Sarangapani			
		2006/0084745	04/2006	Kuhn et al			
		2008/0027534	01/2008	Edwin			

FOREIGN PATENT DOCUMENTS

		DOCUMENT	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO
		1 306 471	05/2003	EP				
		879 069	10/1961	GB				
		2004/053212	06/2004	WIPO				
		2005/066401	07/2005	WIPO				
		1 746 187	01/2007	EP				
		1 847 276	10/2007	EP				

OTHER DOCUMENTS (including Author, Title, Date, Pertinent pages, etc.)

		International Search Report for PCT/EP2008/004135, mailed October 2, 2008.
		THERMOPLAST® BLUE 684, BASF Corourants for Plastics (Oct. 1998).

*Examiner		Date Considered	

Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form PTO-FB-A820 (Also PTO/SB/08A)

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	COLORED SUTURE
First Named Inventor/Applicant Name:	Joseph Arnold Paul Maria SIMMELINK
Filer:	Bryan H. Davidson/Dawn Barbour
Attorney Docket Number:	BHD-4662-3302

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	280	280
UTILITY SEARCH FEE	1111	1	600	600
UTILITY EXAMINATION FEE	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	1051	1	140	140
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		1740

Electronic Acknowledgement Receipt	
EFS ID:	27361408
Application Number:	15338085
International Application Number:	
Confirmation Number:	9789
Title of Invention:	COLORED SUTURE
First Named Inventor/Applicant Name:	Joseph Arnold Paul Maria SIMMELINK
Customer Number:	23117
Filer:	Bryan H. Davidson/Dawn Barbour
Filer Authorized By:	Bryan H. Davidson
Attorney Docket Number:	BHD-4662-3302
Receipt Date:	28-OCT-2016
Filing Date:	
Time Stamp:	18:22:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1740
RAM confirmation Number	103116INTEFSW18243300
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	10-28-2016_Continuation_Trans.pdf	26017 38b2bb19290b7429139246fde2689fac7722867b	no	2
Warnings:					
Information:					
2		10-28-2016_Continuation_Spec.pdf	63336 f48833a2230398f78f669ff2939d394c6d618de9	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	9
	Claims	10	10
	Abstract	11	11

Warnings:					
Information:					
3	Application Data Sheet	10-28-2016_ADS.pdf	1835879 92e8cc9d8dc6c34bf218ec1101f43ecc660952e6	no	8
Warnings:					
Information:					
4	Power of Attorney	10-28-2016_DSM_POWER_OF_ATTORNEY.pdf	3979757 321d1e1e7f29a7511c03aaf03d2fdb6922588dd8	no	2
Warnings:					
Information:					
5	Assignee showing of ownership per 37 CFR 3.73	10-28-2016_Statement_under_37_CFR_3_73_c.pdf	19340 f25521bd1087c1f882924780b3b0510e62ca1dc0	no	1

Warnings:					
Information:					
6		10-28-2016_Submission_of_SB08a.pdf	30264 439066fff7656d36d8e633cf605baafab53eece6	yes	2
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	1	
	Information Disclosure Statement (IDS) Form (SB08)		2	2	
Warnings:					
Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	36942 4f6edddabed78352d30a4d1bfb1b97267abd638f	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	5991535		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/338,085	10/28/2016	1786	1740	BHD-4662-3302	9	1

CONFIRMATION NO. 9789

FILING RECEIPT

23117
NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

OC000000087071133

Date Mailed: 11/09/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Joseph Arnold Paul Maria SIMMELINK, Cadier En Keer, NETHERLANDS;
Claudia C. VAZ, Maastricht, NETHERLANDS;

Applicant(s)

DSM IP ASSETS B.V., Heerlen, NETHERLANDS;

Power of Attorney: The patent practitioners associated with Customer Number 23117

Domestic Priority data as claimed by applicant

This application is a CON of 12/599,869 01/14/2010
which is a 371 of PCT/EP2008/004135 05/23/2008

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
EUROPEAN PATENT OFFICE (EPO) 07010217.3 05/23/2007

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

Request to Retrieve - This application either claims priority to one or more applications filed in an intellectual property Office that participates in the Priority Document Exchange (PDX) program or contains a proper **Request to**

Retrieve Electronic Priority Application(s) (PTO/SB/38 or its equivalent). Consequently, the USPTO will attempt to electronically retrieve these priority documents.

If Required, Foreign Filing License Granted: 11/08/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/338,085**

Projected Publication Date: 02/16/2017

Non-Publication Request: No

Early Publication Request: No

Title

COLORED SUTURE

Preliminary Class

428

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

HONEYWELL Ex. 1002, Page 33 of 112
HONEYWELL INTERNATIONAL INC. v. DSM IP ASSETS B.V.
IPR2024-00493

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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NOT GRANTED

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/338,085	10/28/2016	Joseph Arnold Paul Maria SIMMELINK	BHD-4662-3302

CONFIRMATION NO. 9789

23117
NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

INFORMAL NOTICE

OC000000087071134

Date Mailed: 11/09/2016

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Joseph Arnold Paul Maria SIMMELINK
  Claudia C. VAZ

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/jmilani/

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 15/338,085

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	9 minus 20 =	*			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1600

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.