

VT

PATENTES

IMPRESIÓN 3D

6



Vigilancia
Tecnológica
2º trimestre 2021

NIPO: 116-19-050-9

Aunque en los años 80 comenzaron a desarrollarse los primeros equipos y materiales sobre la tecnología de impresión 3D también denominada fabricación aditiva, no fue hasta 1986 cuando aparece en el mercado la primera impresora 3D comercial, patentada por Charles W. Hull, premiado por la Oficina Europea de Patentes como inventor del año en 2014 en la categoría de inventores no europeos.

Cuando trataba de buscar un sistema para mejorar el proceso de realización de prototipos de pequeñas piezas de plástico que utilizaba para probar nuevos diseños de productos, desarrolló una máquina de impresión 3D que conseguía realizar en pocos minutos procesos que por aquel entonces llevaban semanas.

Contenido



PROCESOS



MATERIALES



DISPOSITIVOS



PRODUCTOS



PROCESAMIENTO
DE DATOS

Desde entonces, la tecnología no ha parado de evolucionar, especialmente en los últimos años, alcanzándose a partir de 2017 un verdadero auge, cuando se incorpora la automatización utilizando software de inteligencia artificial que permite industrializar la fabricación aditiva y multiplicar la capacidad de los sistemas. En estos momentos, en que la pandemia del corona virus SARS-CoV-2 azota a la población mundial, la impresión 3D se ha puesto de gran actualidad. La necesidad de fabricar de forma urgente respiradores o material de protección personal ha despertado el interés por la utilización de esta tecnología, surgiendo así multitud de iniciativas públicas y privadas.

En los últimos años de evolución de la impresión 3D hemos visto pasar del desarrollo conjunto de nuevas tecnologías y materiales innovadores aplicados principalmente a la creación de prototipos y diseños personalizados, a la consecución de productos casi impensables hace tan solo una década. Gracias a esta increíble tecnología hemos visto imprimir, órganos, coches e incluso edificios.

Desde la Oficina Española de Patentes y Marcas, y en cumplimiento de su doble objetivo de proteger y fomentar la innovación tecnológica en nuestro país, así como de divulgar la información técnica que contienen las patentes a través de sus

servicios de Información Tecnológica, se realiza este nuevo Boletín de Vigilancia Tecnológica, que se suma a los dieciséis *Boletines VT* que venimos publicando desde el año 2000 con periodicidad trimestral. Nuestro objetivo es dar a conocer las nuevas solicitudes de patentes que se publican a nivel mundial relacionadas con la tecnología de impresión 3D.

En este Boletín, se incluye una selección de las solicitudes de patentes publicadas a nivel mundial durante el primer trimestre de 2021, distribuidas en cinco apartados: procesos, materiales, dispositivos, productos y procesamiento de datos.

Para cada patente se incluye su número de publicación, con un enlace que permite la consulta del documento completo, el solicitante, el país de origen y su título.

Esperamos que la información aportada en este Boletín de Vigilancia Tecnológica, sirva para identificar tendencias tecnológicas y sus actores, así como para contribuir a la utilización del conocimiento contenido en los documentos de patente como punto de partida para emprender nuevas actividades de investigación y desarrollo. Para suscribirse a este Boletín basta con cumplimentar este [*formulario de suscripción*](#).

Procesos



Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
CN112848283	UNIV SHENZHEN HOSPITAL SOUTHERN MEDICAL	3D printing method for large-size and complex bone tissue
CN112773018	UNIV BEIJING TECHNOLOGY	Method for making masks based on fused deposition in-situ 3D printing technology
US2021154038	FORD GLOBAL TECH LLC [US]	Orthosis with a fabric layer and a 3D printed layer
WO2021099560	BOND HIGH PERFORMANCE 3D TECH BV [NL]	Extrusion-based additive manufacturing: method, 3D printing system, and 3D printed object
EP3815879	PHOTOCENTRIC LTD [GB]	Method of 3D printing in a chamber of adjustable volume using lcd screens as the method of polymerisation
KR2021005270	KERI KOREA ELECTROTECHNOLOGY RES INST [KR]	3D Manufacturing Methods For RF Helical-type Antenna Using Hybrid 3D Printing Technique
WO2021080581	HEWLETT PACKARD DEVELOPMENT CO [US]	Aligning a target with a thermal camera in a 3D printer
WO2021074129	BASF SE [DE]	A process for producing a three-dimensional 3D object employing granulates
WO2021067450	EVOLVE ADDITIVE SOLUTIONS INC [US]	Additive manufacturing system and method with improved surface finish
KR102229822	KOREA INST FOOTWEAR & LEATHER TECH [KR]	3D Method for manufacturing a footwear element
DE102020215305	MTU AERO ENGINES AG [DE]	Layer construction method for the additive production of one component
CN112792344	BEIJING YUDING ADDITIONAL MATERIAL MFG	Laser additive repair method for surface defects of alloy steel rail
WO2021092475	NUBURU INC [US]	Blue laser metal additive manufacturing system
CN112692300	HEFEI XINSHAN YUHANG 3D TECHNOLOGY CO	3D printing method of cermet composite material
CN112692283	UNIV NANJING TECHNOLOGY	Additive manufacturing method of multi-layer memoryable nickel-titanium laminated flexible wall panel
EP3815840	SANDVIK MACHINING SOLUTIONS AB [SE]	Method for producing a tool part and such a tool part
CN112517927	BEIJING XINFENG AEROSPACE EQUIPMENT CO LTD	3D printing manufacturing method for titanium-aluminum dissimilar material
CN112496351	(A) XIAN SAILONG METAL MAT CO LTD	Powder bed electron beam additive manufacturing equipment and manufacturing method
CN112404453	HUBEI SUPER AVIATION TECH CO LTD	Additive manufacturing method for ultra-fine grain material

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
CN112517922	UNIV BEIJING TECHNOLOGY	Method for manufacturing metal microstructure through high repetition frequency ultrafast laser efficient direct writing
US2021138737	MASSACHUSETTS INST TECHNOLOGY [US] STEELCASE INCORPORATED [US]	Additive manufacturing in gel-supported environment
WO2021094206	SIGNIFY HOLDING BV [NL]	FDM printed item with dopant material
EP3812131	IVOCLAR VIVADENT AG [LI]	Stereolithography method
WO2021063806	COVESTRO INTELLECTUAL PROPERTY GMBH & CO KG [DE]	Method for modifying a 3D printed object
WO2021111287	MOI COMPOSITES S R L [IT]	Process for making a reinforcing structure for dental prostheses in continuous fiber composite materials
WO2021101801	CARBON INC [US]	Partial dentures and methods of making the same
WO2021074268	QUARTEX INFORMATICA S A S DI TAMBURRINO IGOR & C [IT]	Process for manufacturing biomedical components and product obtained by way of this process
WO2021076106	HEWLETT PACKARD DEVELOPMENT CO [US]	Three-dimensional printing with melting point suppression agents
US2021177623	WARSAW ORTHOPEDIC INC [US]	In-situ additive implants
WO2021074439	ETH ZUERICH [CH]	Method for preparing live-cell-containing hydrogel parts

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Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
ES2828509	FUNDACION IDONIAL	Composición para la impresión 3D de fármacos semisólidos
WO2021105051	FUND IDONIAL [ES]	Composition for the 3D printing of semisolid drugs
WO2021099448	SOLVAY SPECIALTY POLYMERS USA [US]	Polymers, compositions and method for manufacturing an article by 3D printing
WO2021089313	BASF SE [DE] DING RUI [CN]	Water-washable compositions for use in 3D printing
WO2021066361	(A2 A3) UNIV DANKOOK CHEONAN CAMPUS IND ACADEMIC COOPERATION FOUNDATION [KR] KOREA INST MACH & MATERIALS [KR]	(A2 a3) porous polymer synthetic scaffold prepared using 3D printing, and preparation method therefor
CN112537021	INST MECH CAS	3D printer for high-performance polymer additive manufacturing and printing method
US2021071018	UNIV TEXAS [US]	Compositions and methods for extrusion-based 3D printing of soft materials
US10941274	UNIV KING ABDULAZIZ [SA]	Nanoparticle-infused ABS filament for 3D-printed materials and uses for neutron detection and discrimination
CN112831698	ANDELUN CHONGQING MATERIAL TECHNOLOGY CO LTD	Aluminum alloy powder suitable for laser additive manufacturing and preparation method thereof
CN112754296	GUANGDONG MASTER GROUP CO LTD	Multi-peak structure material on surface of pot and preparation method thereof
CN112848553	BEIJING INST TECHNOLOGY	Reinforced unit cell structure, preparation method, application thereof, and sandwich panel
US2021129392	GM GLOBAL TECH OPERATIONS LLC [US]	Enthalpy-driven self-hardening process at the polymeric/metal layer interface with an interdiffusion process
CN112692303	UNIV JIANGSU	Microfluidic 3D printing composite material preparation device and method
CN112409790	JI HUA LABORATORY	Binder composition applied to 3D printing and using method thereof
CN112404420	UNIV CENTRAL SOUTH	High-strength steel powder for 3D printing and preparation method thereof as well as 3D printing method and prepared high-strength steel
CN112792334	FOSHAN NANHAI INDES VILL ALUMINUM BUILDIN	3D printed wood-grain aluminum veneer and preparation method thereof
CN112548094	UNIV NORTHEASTERN	30Cr15MoY alloy steel powder for laser additive manufacturing or remanufacturing and using method of 30Cr15MoY alloy steel powder

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
JP2021084322	RICOH KK	Active energy ray-curable composition for inkjet, modeling method, and modeling equipme
WO2021105911	RICOH CO LTD [JP] MATSUMURA TAKASHI [JP] NIIMI TATSUYA [JP] SAITO TAKUYA [JP]	Hydrogel liquid precursor, method of manufacturing hydrogel fabrication product, and hydrogel fabrication product
CN112757621	SHANXI ZENGCAI MFG RES INST CO LTD	3D printing materials, 3D printing products and printing methods based on DLP printing
US2021138689	HEXCEL CORP [US]	Polymer Powder and Article Made From the Same
WO2021100838A1	KINSEI MATEC CO LTD [JP]	Casting sand and kit for sand mold
WO2021095769	MITSUBISHI CHEM CORP [JP]	3D printing filament
WO2021092473	UNIV NORTH CAROLINA CHAPEL HILL [US]	Reactive oligomers, additive manufacturing methods, and articles thereof
JP2021080369	UNITIKA LTD	Fused Deposition Modeling 3D printer resin composition for modeling materials and its pellets and filaments
CN112706401	SHANGHAI AEROSPACE EQUIP MFR CO LTD	Weakly anisotropic continuous fiber reinforced polymer composite material and additive manufacturing method
WO2021085481	MITSUI CHEMICALS INC [JP]	Photocurable composition and dental product
WO2021071493	HEWLETT PACKARD DEVELOPMENT CO [US]	Three-dimensional printing with dihydrazides and glycidyl compounds
WO2021080565	HEWLETT PACKARD DEVELOPMENT CO [US]	Three-dimensional printing with tinted anti-coalescing agents
FR3102182	ARKEMA FRANCE [FR]	Powder based on PAEK (s), use in construction processes by sintering, corresponding article.
WO2021066011	MITSUBISHI CHEM CORP [JP]	Resin composition, film, composite material, movable body, and material for three-dimensional shaping use
FR3101806	COMMISSARIAT ENERGIE ATOMIQUE [FR]	Composite material for 3D printing and 3D printing process
WO2021066073	KURARAY NORITAKE DENTAL INC [JP]	Resin composition for stereolithography
WO2021039557	FUDOW COMPANY LTD [JP]	Filament for 3D printer, wound body, method for producing filament for 3D printer, and method for producing shaped article
EP3815816	LIBURDI ENGINEERING [CA]	High gamma prime nickel based superalloy, its use, and method of manufacturing of turbine engine components
US2021094270	FLEX LTD [SG]	Additive manufacturing of highly flexible electrophoretic film and textile composites

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Dispositivos



Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
EP3827970	ARCELIK AS [TR]	A three-dimensional printing device providing automatic calibration
EP3827954	(A2 A3) SEIKO EPSON CORP [JP]	(A2 A3) plasticizing device for a three-dimensional shaping apparatus, and related method
WO2021101499	HEWLETT PACKARD DEVELOPMENT CO [US]	Generating print agent element sets
EP3822063	MANROLAND GOSS WEB SYSTEMS GMBH [DE]; GRAPHO METRONIC MESS UND REGELTECHNIK GMBH [DE]	Quality monitoring on 3D printers
WO2021096520	HEWLETT PACKARD DEVELOPMENT CO [US]	Three-dimensional color reference objects
WO2021080581	HEWLETT PACKARD DEVELOPMENT CO [US]	Aligning a target with a thermal camera in a 3D printer
WO2021058437	ECOLE POLYTECHNIQUE FED LAUSANNE EPFL [CH]	Method and apparatus for volumetric additive manufacturing with digital distortion compensation
WO2021061101	HEWLETT PACKARD DEVELOPMENT CO [US]	Build platforms with calibration elements
EP3797972	XEROX CORP [US]	System and method for calibrating a 3D printer
WO2021113300	NIKON CORP [JP]	Powderbed containment for 3D build printing system parts
EP3827968	ROBOZE S P A [IT]	Calibration system for automatically resetting the effective vertical z coordinate corresponding to the tip of a 3D printer extruder
US2021178699	FUJI XEROX CO LTD [JP]	Manufacturing apparatus
WO2021106699	MIMAKI ENG CO LTD [JP]	Shaping apparatus and shaping method
WO2021112692	UNIV OF CANTERBURY [NZ]	Method and apparatus for manufacturing an object
WO2021108933	UNIV TECNICA FEDERICO SANTA MARIA UTFSM [CL]	Moveable robotic cell for the production of pieces and enclosures printed on site by means of a multi-axis 3D printing system, and operating method
WO2021099910	SISMA SPA [IT]	Radiation system for three-dimensional printing machines
WO2021081320	EVOLVE ADDITIVE SOLUTIONS INC [US]	Cooling apparatus and method for additive manufacture
WO2021099570	UNIV GRAZ TECH [AT]; PREWORKS GMBH [AT]; AVL LIST GMBH [AT]	Apparatus for additive manufacture by a powder-layer process
WO2021094659	PLANMECA OY [FI]	Stereolithography apparatus and resin receptacle

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
EP3815879	PHOTOCENTRIC LTD [GB]	Method of 3D printing in a chamber of adjustable volume using lcd screens as the method of polymerisation
EP3825100	QUANTICA GMBH [DE]	Material ejection system, print head, 3D printer, and method for material ejection
WO2021067450	EVOLVE ADDITIVE SOLUTIONS INC [US]	Additive manufacturing system and method with improved surface finish
WO2021061145	HEWLETT PACKARD DEVELOPMENT CO [US]	3D printer platform mover
WO2021050908	FORMLABS INC [US]; WIGHTON SHANE [US]	Liquid interface techniques for additive fabrication and related systems

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Productos



Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
CN112743835	LIAOCHENG DONGCHANGFU MATERNAL & CHILD	Medical protective gear and manufacturing method thereof
CN112757625	HUARONG PRINTING BEIJING TECHNOLOGY CO	A continuous carbon fiber FDM 3D printing method for the calf of a quadruped robot
WO2021096520	HEWLETT PACKARD DEVELOPMENT CO [US]	Three-dimensional color reference objects
CN112674427	QINGFENG BEIJING TECHNOLOGY CO LTD	A 3D printed functional unit and shoe sole applying the functional unit
EP3819109	GOODYEAR TIRE & RUBBER [US]	A tire segment model and a method of making a tire mold segment
CN112644016	UNIV NORTHEAST DIANLI	Construction method of natural bisexual biomass gel artificial muscle device
CN213339640	JI L	Hollow ball music box
US2021122064	KOREA ADVANCED INST SCI & TECH [KR]	Three-dimensional electromechanical adhesive surface structure capable of adhesive force manipulation and tactile sensing, design and manufacturing method thereof using 3D printing
CN112494720	UNIV HUAZHONG SCIENCE TECH	Conductive degradable multifunctional bone implant material for 3D printing and application
CN112480450	INST CHEMISTRY CAS	Method for improving interface strength of 3D printed piece
CN112472997	PROVINCIAL HOSPITAL AFFILIATED TO SHANDONG FIRST MEDICAL UNIV SHANDONG PROVINCIAL HOSPITAL	Dressing material for knee joint inflammation
US2021177627	UNIV COLORADO REGENTS [US]; POINT DESIGNS LLC [US]	Prosthetic partial fingers
WO2021116990	COMAU SPA [IT]	A gripping tool which can be used by a manipulator device for picking up and handling pieces
CN112790843	QINGDAO WOMEN & CHILDRENS HOSPITAL	Fixed guiding drainage device for children with intracranial hemorrhage, and preparation and use methods thereof
CN112902744	UNIV HEBEI SCI & TECHNOLOGY	Rocket launch tube bracket and integrated rapid prototyping method thereof
CN213372819	ANHUI PRINTING MEDICAL TECHNOLOGY CO LTD	Ankle-joint locating guide supporting device
KR20210067829	CHOI N	Remote control kit car
US2021127772	UNIV NORTH CAROLINA STATE [US]	Breast motion simulator
CN112587709	ROBUSTNIQUE CORP LTD	3D printing dressing adhesive tape containing multiple growth factors and preparation method
US2021145128	NIKE INC [US]	Last system for articles with braided components

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
DE102019131264	FENSTERLE LEONIE [DE]	Eyebrow stamp
DE102019130796	GEA MECHANICAL EQUIPMENT GMBH [DE]	Separation plate
EP3822079	HAMILTON SUNDSTRAND CORP [US]	Self-supporting additively-manufactured heat exchanger header
CN112716089	NANJING AMIBA ENG STRUCTURE OPTIMIZATION	Self-adaptive lattice type 3D printing helmet buffer layer and manufacturing method thereof
WO2021080680	GEN ELECTRIC [US]	Gas turbine engine component with independent cooling circuits
FR3102316	COMMISSARIAT ENERGIE ATOMIQUE [FR]	Monobloc and ferromagnetic part of a rotating electrical machine
EP3799975	DELAVAN INC [US]	Fluid conduits with heat shielding
WO2021037549	SCHERRER INST PAUL [CH]	Fabrication of blazed diffractive optics by through-mask oxidation

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Procesamiento de Datos



Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
WO2021102047	CARL ZEISS IND METROLOGY LLC [US]; UT BATTELLE LLC [US]	Method for rapid development of additive manufacturing parameter set
WO2021099957	THINKING ADDITIVE LTD [GB]	3d printing machine and manufacturing method
US2021122120	APPLIED MATERIALS INC [US]	Melt pool monitoring in multi-laser systems
WO2021094613	DENTSPLY SIRONA INC [US]; SIRONA DENTAL SYSTEMS GMBH [DE]	System and method for supervised post-processing
EP3822725	GEN ELECTRIC [US]	Systems, and methods for diagnosing an additive manufacturing device
WO2021090760	JAPAN MEDICAL COMPANY INC [JP]	Method for obtaining correction target skull shape and method for generating plagiocephaly correction target data
WO2021080570	HEWLETT PACKARD DEVELOPMENT CO [US]	Recoater operation adjustments based on layer structures
WO2021086347	HEWLETT PACKARD DEVELOPMENT CO [US]	Thermal interactions
WO2021086310	HEWLETT PACKARD DEVELOPMENT CO [US]	Generating structural models for additive manufacture of an object
WO2021080590	HEWLETT PACKARD DEVELOPMENT CO [US]	Determining whether to print a three-dimensional print job
WO2021086318	HEWLETT PACKARD DEVELOPMENT CO [US]	Generation of print configuration data for three dimensional printers
WO2021086346	HEWLETT PACKARD DEVELOPMENT CO [US]	Print operation using plural sets of process values
WO2021080597	HEWLETT PACKARD DEVELOPMENT CO [US]	Chamber temperature control
WO2021080557	HEWLETT PACKARD DEVELOPMENT CO [US]	Determining build parameters in additive manufacturing
WO2021076115	HEWLETT PACKARD DEVELOPMENT CO [US]	Generation of modified model data for three-dimensional printers
WO2021061149	HEWLETT PACKARD DEVELOPMENT CO [US]	Three-dimensional model textures
EP3797907	GEN ELECTRIC [US]	Method and system of additive manufacturing contour-based hatching
WO2020005228	L LIVERMORE NAT SECURITY LLC [US]	Laser powder bed fusion additive manufacturing in-process monitoring and optimization using thermionic emission detection



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