

VT

PATENTES

IMPRESIÓN 3D

16



Oficina Española
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OBJETIVOS
DE DESARROLLO
SOSTENIBLE



Vigilancia
Tecnológica
4º trimestre 2023

NIPO: 116-19-050-9

En este Boletín de Vigilancia Tecnológica se recogen, de manera trimestral, los avances acontecidos en el campo de la tecnología de Impresión 3D que se materializa en forma de solicitudes de patente en todo el mundo.

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 testar 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



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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 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 cuarto trimestre de 2023, distribuidas en cinco apartados: procesos, materiales, dispositivos, productos y procesamiento de datos.

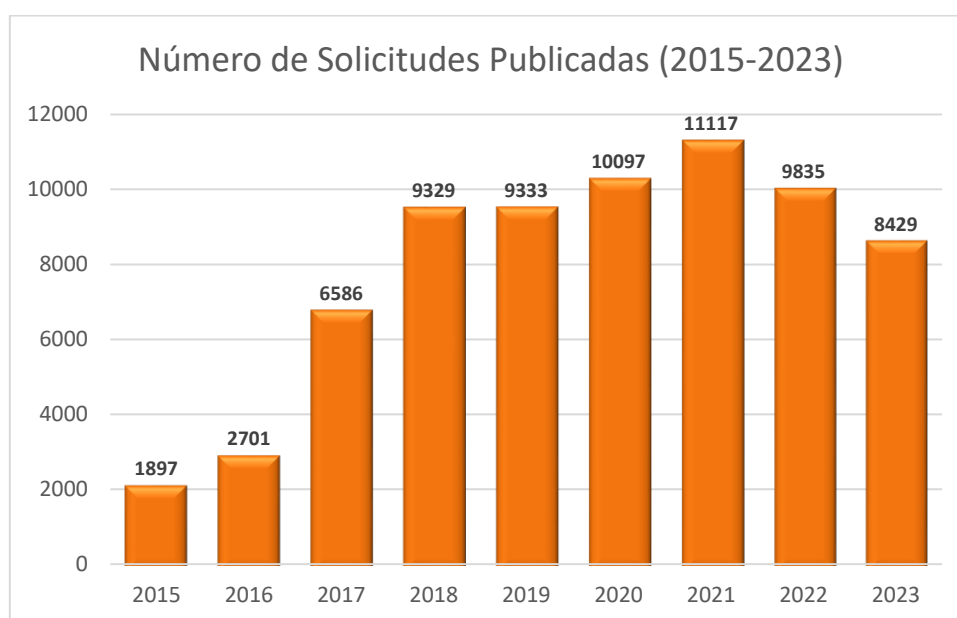
Para cada patente se incluye su número de publicación, con un enlace que permite la consulta del documento completo, el solicitante, el país de origen y su título.

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*](#).

ANÁLISIS ESTADÍSTICO DE LAS SOLICITUDES DE PATENTE PUBLICADAS EN EL PERIODO 2015-2023

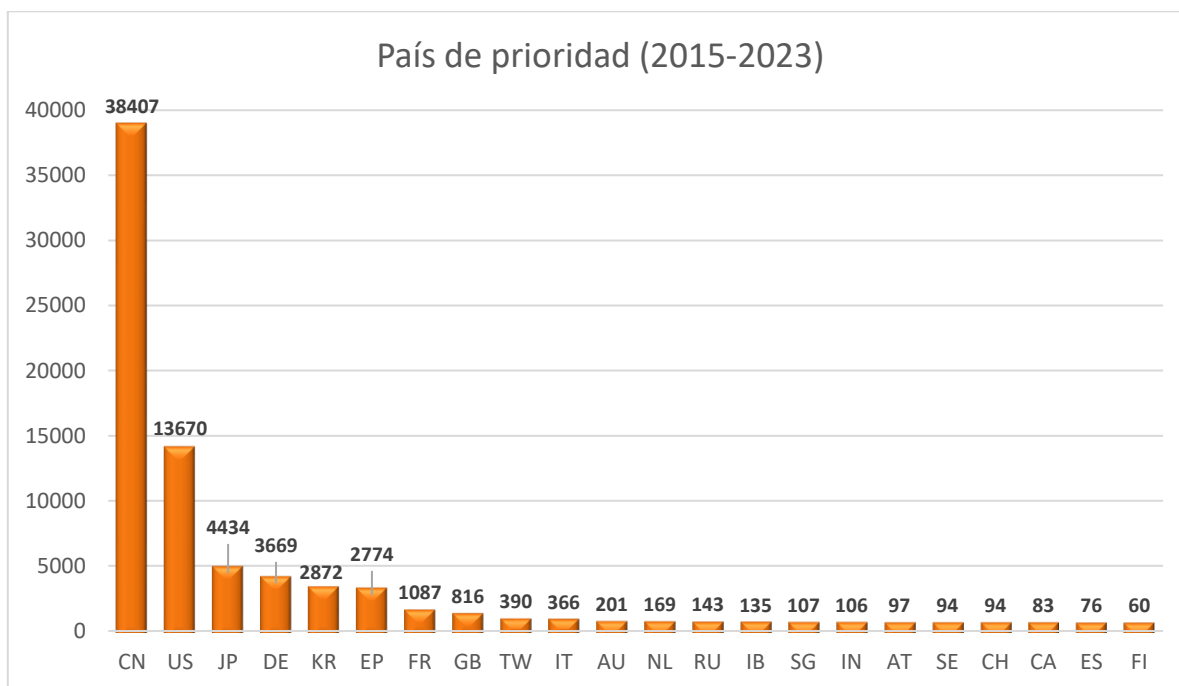
Se ha realizado un estudio estadístico con el fin de analizar la evolución tecnológica de la Impresión 3D en lo que respecta a la protección de invenciones por medio de patentes de invención. Se han extraído los datos de las publicaciones de solicitudes de patentes publicadas desde el año 2015 hasta el 2023, recopilando de ésta forma las tendencias en términos de innovación para esta tecnología de los últimos años. La herramienta empleada para este estudio ha sido Global Patent Index (GPI) de la Oficina Europea de Patentes, extrayéndose los datos a fecha de 20/02/2024. Se han recuperado un total de 69.681 familias de patentes, que corresponden a 173.626 documentos de patente.

En la Gráfica 1 se recoge la evolución del número de solicitudes del sector desde el año 2015. Se observa como tras un acusado crecimiento del año 2016 a 2018, desde el 2019 parece haberse estabilizado el número de publicaciones sobre tecnología de impresión 3D en los últimos años, destacando un despunte en 2021.



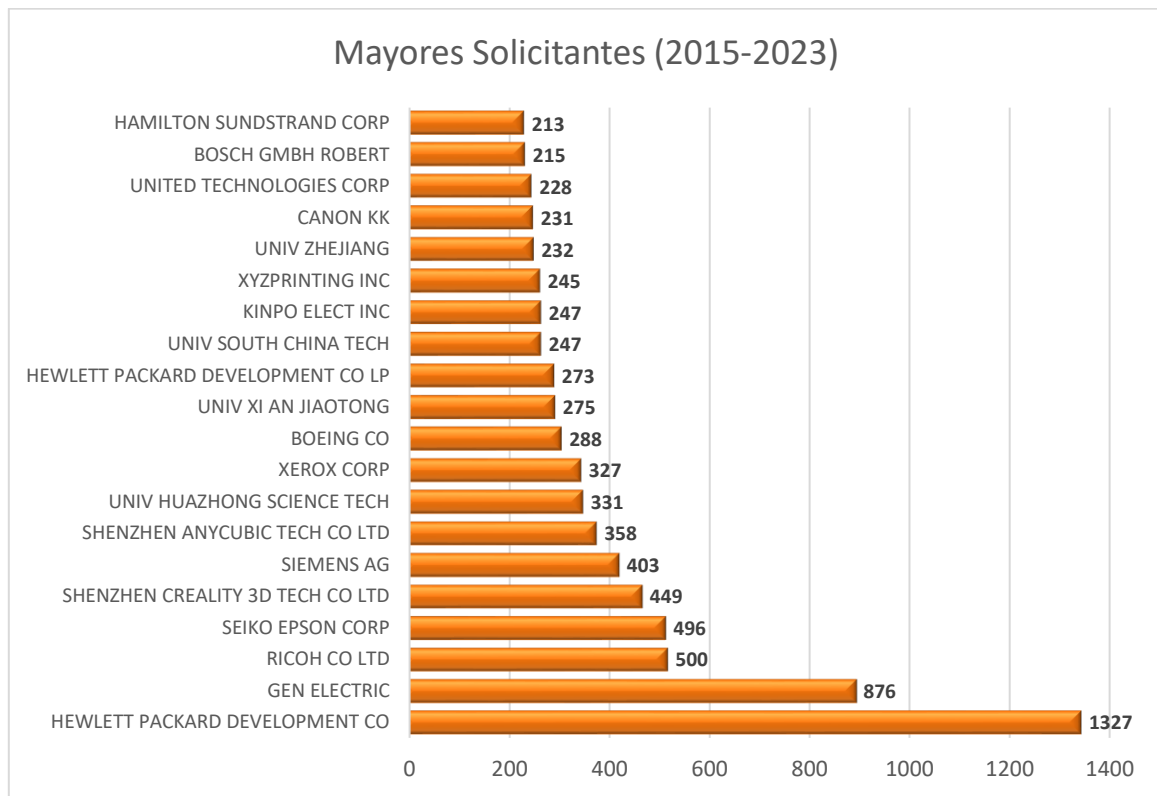
Gráfica 1. Número de solicitudes publicadas por año desde el 2015 hasta el 2023

La Gráfica 2 agrupa los documentos de patente recuperados con relación al país de origen de la tecnología de impresión 3D. Se puede apreciar que China figura en primer lugar, con una enorme diferencia respecto del segundo país con mayor número de publicaciones, que es Estados Unidos. En el caso de España, nuestro país figura en el puesto número 21, mismo puesto en que figuraba en el año 2022, en este caso con 76 patentes publicadas.



Gráfica 2: Documentos de patente agrupados por país de prioridad

La Gráfica 3, se muestra la relación de los solicitantes con mayor número de patentes publicadas en relación con la tecnología de Impresión 3D. Se observa que, de manera casi exclusiva, los grandes titulares de la innovación son empresas, destacando la empresa Hewlett Packard como líder del sector.



Gráfica 3: Mayores solicitantes de solicitudes de patente

Para finalizar, la Gráfica 4 plasma la actividad innovadora de las mayores empresas en el sector, año a año. Se puede observar que, para las empresas más punteras, los años 2017 a 2019 se aprecia un crecimiento considerable en el sector, que se ha estabilizado desde entonces.



Gráfica 4: Actividad en la solicitud de patentes año a año de los mayores solicitantes de patentes de impresión 3D.

Procesos



Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
WO 2023242334	SIGNIFY HOLDING BV	Lighting device
EP 4257270	LINDE GMBH	Method and system for generating a three-dimensional workpiece
WO 2023201307	INKBIT LLC	Materials for free-radical activation of a latent catalyst for ring-opening metathesis polymerization (romp) and uses thereof
WO 2023234905	ONDOKUZ MAYIS UNIV	Adaptive slicing and variable binder jetting method in binder jetting technique
WO 2023196569	CURITEVA INC	Additively manufactured porous polymer medical implants
EP 4253006	AIRBUS OPERATIONS GMBH	Computer-implemented method for generating thermally improved machine control data for additive manufacturing machines
WO 2023235668	SWAGELOK CO	Laser-assisted reagent activation and property modification of self-passivating metals
WO 2023193006	3DFORTIFY INC	Image transformations to enhance edge and surface clarity in additive manufacturing
WO 2023229561	TUSAS TURK HAVACILIK VE UZAY SANAYII ANONIM Sirketi	An optimization method
EP 4292731	ELEMENT 22 GMBH	Method for producing layered sheet structures from titanium or titanium alloys for use in electrodes of pem-type electrolyzers and/or fuel cells
WO 2023225540	MEKONOS INC	Fabrication methods for high aspect ratio microneedles and tools
WO 2023213337	INVENT MEDICAL GROUP S R O	Method of designing and manufacturing an elastic circumferential rim of a prosthetic or orthotic device

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Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
WO2023211472	(HEWP) HEWLETT-PACKARD DEV CO LP (UYTU) UNIV NANYANG TECHNOLOGICAL	Build material composition used for three-dimensional printed article such as three-dimensional polyamide article, comprises polyamide-12 particles, solid glass beads, and glass fibers having preset average aspect ratio and average length
WO2023210074	(MURA) MURATA MFG CO LTD	Production of structure E.G. composite oxide structure, involves producing composite oxide structure containing metal elements by irradiating metal material containing metal ions of metal elements with laser beam
WO2023190931	(KURS) KURARAY NORITAKE DENTAL INC	Resin composition for stereolithography used for forming 3-dimensional molded article for dental material, denture base material, comprises different polyfunctional (meth)acrylic monomers having preset molecular weights
JP2023151092	(MISP) MITSUBISHI PENCIL CO LTD	Resin composition used for producing a carbon molded body by three-dimensional printer molding and carbonization, comprises thermoplastic resin, and carbonaceous filler dispersed in these thermoplastic resins
CN116970235	(NANO-N) NANO E	Composite composition used for forming filaments in the form of coil used in three-dimensional printing of composite shaped component, comprises cyclic olefin copolymer, styrenic block copolymer, and dielectric inorganic filler composition
JP2023163838	(MIKI) MIMAKI ENG CO LTD	Manufacture of three-dimensional article involves preparing three-dimensional article to be processed three-dimensionally formed using electron beam curing ink, and performing aging for reducing color tone of discolored portion of three-dimensional structure
DE102022001070	(UYFB) UNIV FREIBERG TECH BERGAKADEMIE	Filament for thermoplastic three-dimensional printing of ceramic, metal or metal-ceramic composite, comprises via layered structure of binder system containing polyethylene, stearic acid, lignin sulfonate, cellulose and fine ceramic powder
WO2023233062	(UYJA-N) UNIV JAUME I	Surface-passivated perovskite nanocrystal used in preparation of ink, comprises halide-based perovskite nanocrystal chosen from halide-based compounds doped with e.g. bismuth(III)-ion, and ligand attached to surface of halogen-based perovskite nanocrystal, where ligand is tocopherol

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
WO2023180534	(SOLV) SOLVAY SPECIALTY POLYMERS USA LLC	Filament useful in three dimensional printing, comprises polymer composition comprising polyamide comprising recurring units, and proportion of moieties derived from 4,4'-diaminodicyclohexylmethane in trans/trans configuration
WO2023220463	(QUAD-N) QUADRATIC 3D INC	Forming object in volume of photohardenable composition used in printing, comprises E.G. irradiating locations volume including photohardenable composition comprising photohardenable resin component and photoswitchable photoinitiator
WO2023223238	(UYRM) UNIV ROMA LA SAPIENZA (NAFI-N) IST NAZ DI FISICA NUCLEARE	Production of mixture of copper powders and carbon nanotubes for manufacturing additive, involves functionalizing carbon nanotubes with functional group, dispersing functionalized carbon nanotubes in solvent, adding copper powder comprising particles having preset diameter to suspension and mixing
WO2023190562	(DNIN) KJ CHEM CORP	Curable composition used in E.G. coating composition, adhesive composition and ink composition, comprises water-insoluble polyfunctional (meth)acrylamide, and polymerizable compound other than water-insoluble polyfunctional (meth)acrylamide
IN202231018302	(TAST) TATA STEEL LTD	Coating iron powder particles, comprises mixing iron powder and binder to form encapsulated mixture, mixing the mixture and silica by mechanical mixing process to form coated mixture, and cooling the mixture
EP4276137	(INRG) INST NAT RECH AGRIC ALIMENTATION & ENVIR (NZFO-N) NEW ZEALAND FOREST RES INST LTD	Composite powder used for manufacturing additive for product, comprises composite particles comprising polymer matrix selected from polyhydroxyalkanoates, and auxiliary matrix selected from biobased fillers and biobased waxes
FR3135217	(COMS) COMMISSARIAT ENERGIE ATOMIQUE	Additive manufacturing of aluminum or aluminum alloy component used for E.G. automobile and aerospace industry, involves melting layer of mixture of powders including particles made of aluminum or its alloy, silicon carbide particles and zirconium particles, and solidifying mixture

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Dispositivos



Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
WO 2023208980	NIKON SLM SOLUTIONS AG	Technique for powder removal from a three-dimensional workpiece generated via additive manufacturing
EP 4282621	AIRBUS OPERATIONS GMBH	Additive manufacturing device for printing of a thermoplastic filament with an embedded electrical cable
WO 2023225298	QUADRATIC 3D INC	Volumetric three-dimensional (3D) printing system
EP 4253007	APIUM ADDITIVE TECH GMBH	Method for surface processing of a 3D printed object
WO 2023200089	OSSTEM IMPLANT CO LTD	Three-dimensional printer molded object processing apparatus
EP 4272880	SIEMENS ENERGY GLOBAL GMBH & CO KG	Stress relieving for continuous flow engine components
WO 2023200894	SAKUU CORP	3D printer with pressure-assisted fluid extraction
WO 2023238089	CARACOL S R L	Apparatus and method for supporting an article in the course of manufacture by an additive manufacturing process
EP 4286144	DYEMANSION GMBH	Method for treating a surface of a moulded part
EP 4253004	VOELKL PATENTE GMBH & CO KG	Method for shipping a product and wrapping device for same
WO 2023215606	VELO3D INC	Safe treatment of debris
WO 2023225022	NEXA3D INC	System and method for dispensing fluid from a container with a stacked arrangement of cross-slit valves
WO 2023194043	TRUMPF LASER & SYSTEMTECHNIK GMBH	Suction device for sucking up process gas with a stationary gas-conveying channel and device for producing three-dimensional objects comprising such a suction device
WO 2023217496	NIKON SLM SOLUTIONS AG	Additive manufacturing facility
WO 2023227255	META PLATFORMS TECH LLC	Method for producing a three-dimensional optical structure and three-dimensional optical structure
WO 2023227254	META PLATFORMS TECH LLC	Method for producing a three-dimensional optical structure and three-dimensional optical structure
WO 2023183310	AZUL 3D INC	Three dimensional printing process flow management and support systems
WO 2023184718	JIANGSU HAOYU ELECTRONIC TECH CO LTD	Handheld 3D drawing arrangement and reciprocating filament moving system and filament moving method thereof
WO 2023213625	TDK ELECTRONICS AG	Additive manufacturing method involving modification of sublayers
WO 2023194876	CARACOL S R L	Device and method for feeding polymeric material to a printhead of an additive manufacturing machine and additive manufacturing machine

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
WO 2023215512	UNIV UTAH RES FOUND HO JOHN S XIN YANG	Near-field microwave 3D printing of functional devices
EP 4295972	TRUMPF ADDITIVE MFG ITALIA S R L	Apparatus for additive manufacturing, having an easily connectable container
WO 2023182941	AGENCY SCIENCE TECH & RES STAR3D MAT DEVELOPMENT COMPANY SINGAPORE PTE LTD	A polymerizable composition, a three-dimensional printed article and methods of preparing the same
EP 4275804	DIGITAL METAL AB	Wash station for metal-binder jetting
WO 2023217831	STEINER STEPHAN INSPIRE AG	Device and method for the additive manufacturing of a three-dimensional object
WO2023182034	(FUJF) FUJI FILM CORP	Printing data generation device for generating print data of printer used in printing system, has processor which performs processing to switch laminating direction of two-dimensional slice data items, when three-dimensional data is converted into two-dimensional slice data items in laminating order
WO2023238436	(RLND) ROLAND DG CORP	Three-dimensional shaping apparatus provided in shaping tank, has lifting and lowering device tank that is positioned in horizontal direction for storing powder material and supplying powder material to molding tank, and first screen which is extended upward from upper position of molding table
WO2023218709	(RLND) ROLAND DG CORP	Three-dimensional (3D) shaping apparatus for 3D shaped article, has first receiving unit that is configured for receiving powder material flowing out from supply tank, when spreading unit conveys the powder material
DE102022108442	(TRUM) TRUMPF LASER & SYSTEMTECHNIK GMBH	Method for layer-by-layer production of object on construction platform by local solidification of powdery material in respective layer, involves updating programmed coordinate transformations for scanners taking into account current actual coordinate transformations
WO2023239333	(FIGE-N) FIGESFIZIK & GEOMETRIDE BILGISAYAR SIMUL	Ring configuration for providing motion and sealing of table used in additive machine tool, has spring is included within seats that are located at both ends, so as to be in number upon ring elements that are interconnected to enable ring elements to apply thrust to one another in opposite direction
IN202241013539	(THIN-N) THINKMETAL PRIVATE LTD	Desktop three-dimensional printing method for three-dimensional printing device in metal three-dimensional printer, involves integrating debinding, sintering and heat treatment of three-dimensional object in single heat equipment to reduce overall process lead time
JP2023159678	(KOBM) KOBE SEIKO SHO KK (KOBM) KOBE STEEL LTD	Method for managing quality of additively manufactured object using welding robot, involves comparing defect dimension with allowable defect size, and subjecting quality of bead or laminate shaped article to quality determination

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
FR3133778	(AIRL) AIR LIQUIDE SA	Device for additive manufacturing of portion, has modular robot whose movement arms are arranged with modules that are arranged physically distinct and assembled between them by removable assembly unit so that total length of first and/or second movement arm is adjustable
WO2023242117	(SGNF) SIGNIFY HOLDING BV	Filament for use in method of manufacturing three-dimensional (3D) item by fused deposition modeling using 3D printer, has filament extensions comprising first and second subset of filament extensions comprising first and second material of first and second color
FR3134686	(PATI-N) LA PATISSERIE NUMERIQUE	Cartesian type three-dimensional printing device for food product comprises removable printing tray, print head positioned opposite tray printing and capable of extruding pasta and print head moving along two orthogonal axes
WO2023186656	(SGNF) SIGNIFY HOLDING BV	Method for manufacturing three dimensional (3D) item by means of fused deposition modeling using 3D printer, involves melting 3D printable material in printer head, layer-wise depositing 3D printable material to provide 3D item comprising layers of 3D printed material, and drying filaments
FR3136231	(EADS) AIRBUS OPERATIONS SAS	Device for directed energy deposition of material in form of wire under focused energy through E.G. laser beam, has slide connection allowing rod to translate in direction and return element to translate rod in direction of axis of rotation
RU2782715	(AVPI-N) AVP INNOVATIONS LLC	Method for additive manufacturing of products of complex shape includes mixing a refractory molding material with a catalyst, layer-by-layer application of the resulting mixture onto a working surface
WO2023204697	(ADDO-N) ADDOPTICS BV	Method for manufacturing mold for optical element, involves depositing amount of master substance on substrate area by system in accordance with former dataset to provide master piece
KR20230141991	(UYAJ) UNIV AJOU IND ACAD COOP FOUND	Method for manufacturing phantom, involves printing phantom model with three-dimensional printer, removing first support, injecting curing material into space where first support was located, removing second support
US2023405950	(GOOD) GOODYEAR TIRE & RUBBER CO	Method for producing branched spoke of non-pneumatic tire structure of E.G. passenger car, involves providing first plastic composition in form of filament, and forming spoke of multiple spokes, inner band and outer band of non-pneumatic tire structure by three-dimensional printing

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
JP2023181933	(HITA) HITACHI LTD	Device for determining quality of added molded article, has output unit that is configured for outputting information on defect position of additional article from information on result of prediction of generation of defects of respective layers obtained by second evaluation unit
NL2031725	(ULTI-N) ULTIMAKER BV	Print bed assembly for additive manufacturing system, has push element coupled at rear side of slide body and arranged to move build plate relative to carrier plate in direction when slide body is moved at predefined distance
WO2023192738	(MNFR) MANN FOUND SCI RES ALFRED E	Wireless power transfer device for generating magnetic field and controlling direction of magnetic field, has first ferrite rod and nonmagnetic layer that are fabricated using additive manufacturing
WO2023228221	(AXTR-N) AXTRA3D INC (ZITE-I) ZITELLI G	Photo-curing or selective laser sintering three-dimensional printing apparatus with hybrid lighting system at constant wavelength and variable power for polymerization/sintering/melting of plastic powders, has light sources and polarizer
WO2023242069	(SGNF) SIGNIFY HOLDING BV	Printer head arrangement for three-dimensional (3D) printing apparatus, has first nozzle and second nozzle arranged at predetermined distance parallel to first direction from each other, and configured to simultaneously deposit first printing material and second printing material, respectively
JP7370027	(KAJI) KAJIMA CORP (STAR-N) STARTECHNO CO LTD	Three-dimensional shaping apparatus for manufacturing three-dimensional shaped article, has fluid discharging unit that discharges fluid in vertically oriented state by articulated robot, and is dismantled in state of directing sideways by articulated robot
WO2023186755	(SGNF) SIGNIFY HOLDING BV	Method for producing three-dimensional item involves feeding aligned elongated pellets through feeding duct into printer head of printer, and layer-wise depositing first 3D printable material to obtain 3D item
JP7370026	(KAJI) KAJIMA CORP (STAR-N) STARTECHNO CO LTD	Apparatus for manufacturing three-dimensional shaped article by laminating fluid material from nozzle, has nozzle connected to tip of hollow housing and providing opening, and nozzle rotating mechanism for rotating nozzle with respect to hollow housing
WO2023239332	(FIGE-N) FIGESFIZIK & GEOMETRIDE BILGISAYAR SIMUL	Adjusting mechanism for switching processing table into desired position, has motion provider that enables female screw to move up and down by contacting movable table upon providing motion, and enables to switch contacted point of movable table into desired position according to horizontal plane

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
US2023356459	(PAXI-N) PAXIS LLC	Deposition mechanism for producing three-dimensional object on build platform using resin in layer-by-layer technique, has carrying surface permeable to electromagnetic waves to permit waves to partially solidify resin applied by surface
CA3212584	(RAYO-N) RAYO 3D BIOTECH OY	Method for producing printable object, involves providing additional supporting material into printing well during printing, and curing injected printing material using a light emitting source providing light
WO2023220816	(ASPE-N) ASPECT BIOSYSTEMS LTD	Fabrication platform for supporting bioprinted fiber structure during printing, patterning and/or processing, has frame defining void and posts on sides of frame for securing and suspending cross-linkable fiber
US2023373007	(XERO) XEROX CORP	Additive manufacturing drop ejecting apparatus used to form metal portions that exhibit roughness scores for metal object overhanging features, comprise controller operatively connected to ejector and digital image data generator

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Productos



Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
DE102022109672	(GOOD-N) GOODLY INNOVATIONS GMBH	Covering device for head-mounted visual output device I.E. head-mounted display of output device set, has holding frame that comprises two separate frame elements configured to form frame shape of holding frame by one further element of holding frame and/or by closure device
FR3136769	(AQOR) ARKEMA FRANCE	Composition used as organogelator in formulation of monomers, sealants, adhesives, paints, and for three-dimensional printing process for forming article, comprises block copolymer, hydrogenated castor oil, fatty acid diamide and fatty acid triamide
WO2023242179	(SGNF) SIGNIFY HOLDING BV	Method for producing three-dimensional item by fused deposition modeling, involves layer-wise depositing 3D printable material, to provide 3D item and thermoplastic material and photocatalytic material where during 3D printing stage and producing pores in 3D printable material
WO2023180124	(SIKA) SIKA TECHNOLOGY AG	Production of sealing element for waterproofing membrane of injection hole, involves providing digital model of sealing element, comprising baseplate and tubular extension which is composed of polymeric composition comprising polymer, and projecting outwardly from baseplate by additive manufacturing
US2023320864	(LINA-N) LINARES SPINAL DEVICES LLC	Spinal jack for providing inter-vertebral support between upper and lower succeeding vertebrae of patient, has stems including additional worm threads inter-engaging with mating interior threads defined in outer gears such that rotation of worm gear linearly displaces stems
WO2023212416	(UPIT) UNIV PITTSBURGH COMMONWEALTH SYSTEM HIGH	Bioreactor useful for producing E.G. osteoblasts, comprises first chamber having upper portion and lower portion, second chamber having synovial cells within tissue scaffold, third chamber having adipose cells within tissue scaffold, fourth chamber having sensory neurons, and influx conduits
WO2023203145	(CREA-N) CREATE IT REAL AS	Method for printing interior infill using three-dimensional (3D) printer, involves printing first and second set of layers of first and second infill pattern, where first general direction of first contact layer is different from second general direction of second contact layer

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
JP7176681	(NATU-N) NATURE ARCHITECTS INC	Structure used for heat exchange, has second flow path that is formed so as to revolve in second direction which is opposite to first direction, when first flow path is viewed along extending direction
WO2023234236	(TERU) TERUMO CORP	Technique simulator used for teaching procedures using catheter, has shunt portion that is provided to communicate cavity and first flow path and connects second flow path element and first flow path element, and branches are independent from shunt part
KR20230153558	(UYAJ) UNIV AJOU IND ACAD COOP FOUND	Manufacturing three-dimensional (3D) printed artificial tissue by decellularizing and powdering tissue-derived extracellular matrix, adding decellularized extracellular matrix powder to culture medium and culturing, homogenizing and applying homogenized tissue strand ink to 3D printing equipment
US2023303439	(TOTT-I) TOTTOSI A	Composition for underwater structures, includes quantity of pure calcium compounds, ashes, quantity of clay, quantity of cement, quantity of water, and slurry blend comprising quantity of pure calcium compounds, quantity of ashes, quantity of clay, quantity of cement, and quantity of water
WO2023205716	(CABN) CARBON INC	Hollow dental mold for use in making dental appliances E.G. orthodontic aligners, has drain channels that are extended from hollow cavity upward through upper portion, and are configured for draining of residual polymerizable resin from hollow cavity
WO2023181104	(YAWA) NIPPON STEEL CORP	Titanium alloy material used for forming wire and powder, comprises aluminum, iron, copper, oxygen, tin, niobium, silicon, molybdenum and remainder of titanium, including alpha phase having average long axis length and average aspect ratio, and beta phase as metal structure
WO2023228063	(MTOR-N) MT ORTHO SRL (GUGL-I) GUGLIELMINO E	Three-dimensional cell structure for use in lattice structure for biomedical applications for producing bone scaffolds, has struts comprising straight sections of cylindrical shape connected together in nodes to form constituent elements
WO2023214567	(HITK) PROTERIAL LTD	Alloy in the form of powder E.G. granulated sintered powder used for forming alloy component for mold and composite material, comprises chromium, carbon, titanium, niobium, tantalum, boron, aluminum, molybdenum, tungsten and nickel
WO2023227929	(APER-N) APERAM	Alloy for manufacturing tools intended for manufacture of aeronautical parts made of composite material, comprises nickel, cobalt, titanium, rare earth, silicon, manganese, carbon, and iron and impurities

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
EP4289750	(TETR) TETRA LAVAL HOLDINGS & FINANCE SA	Forming device for packaging assembly for forming and sealing packages containing pourable food product E.G. fruit juice, has hollow body for externally cooperating in contact, and reinforcing inner structure housed in cavity and surrounded by hollow body to reinforce hollow structure
US2023341190	(RAYT) RAYTHEON CO	Method for forming electroformed heat exchanger with embedded pulsating heat pipe in thermal management system, involves using electroforming to deposit second portion of material over first portion of material and over preformed tube to form heat exchanger, where pipe to transport thermal energy
FI20225454	(ABOA-N) ABO AKAD	Hydrogel formulation used in ink formulation for forming three-dimensional products, comprises methacrylated cellulose nanofibrils having preset charge density, and water
FR3135412	(EADS) AIRBUS OPERATIONS SAS	Method for additively manufacturing of intersection of main and secondary ribs by stacking layers of material for ribbed panel, involves obtaining part by depositing bead of material attached to section
EP4282559	(SCHU-N) SCHUNK SINTERMETALLTECHNIK GMBH	Production of hybrid component E.G. electrode, involves providing component made of metallic material, providing component made of electrically insulating material, providing component made of metallic material and having recess, forming overall component arrangement and sintering
EP4269000	(SIEI) SIEMENS AG	Additively produced magnetic sheet used for laminated core for rotor, comprises material components including material component arranged in radially inner region of sheet, material component arranged in radially outer region and transition region provided between radially inner and outer regions
EP4275814	(ANSA) ANSALDO ENERGIA SPA	Cobalt-based alloy used for additive manufacturing process, comprises chromium, nickel, tungsten, aluminum, titanium, tantalum, carbon, hafnium, niobium, yttrium, zirconium and cobalt
US11835151	(ERSO) EMERSON PROCESS MANAGEMENT REGULATOR TEC	Dual-valve assembly E.G. handle, has handle flexible arm that is coupled to and extending from portion, where flexible arm having lock edge sized to fit within notch to limit rotation of handle relative to first and second valves
EP4286785	(SUNH) HAMILTON SUNDSTRAND CORP	Radial diffuser for heat exchanger system, has movable diffuser hub configured to move with respect to central flow axis relative to diffuser wall for altering fluid flow through radial diffuser

Nº PUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
EP4257916	(VOLV) VOLVO TRUCK CORP	Assembly-free tool for maintenance of engine in heavy-duty vehicles E.G. trucks, has bar that is axially translatable in relation to housing which comprises embedded locking structure for holding bar in locking position such that movement of bar in axial direction is stopped
US2023350382	(IOTE-N) IOTECHA CORP	Auxiliary device for providing customized electric vehicle chargers for users, has communication interface configured for connecting to internet protocol network, display coupled to processor, and enclosure including mounting assembly for securing to EV charger
FR3136543	(COMS) COMMISSARIAT ENERGIE ATOMIQUE	Method for producing heat exchanger module of heat exchanger used in small modular reactor (SMR) type light water nuclear reactor, involves carrying out assembly by hot pressing of stack within curvature gauge so as to obtain final assembly with final bending of heat exchanger module
US2023380541	(HILO-N) HILOS INC	Three-dimensional printed or additive manufacturing construction footwear assembly, has outsole portion connected to bottom of sole assembly, and forming ground engaging surface and closing and sealing cavities in sole assembly

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CONTENIDO

Procesamiento de Datos



NºPUBLICACIÓN	SOLICITANTE Y PAÍS DE ORIGEN	CONTENIDO TÉCNICO
WO 2023185930	SHENZHEN ANYCUBIC TECH CO LTD	Printing control method, photocuring three-dimensional printer and readable storage medium
WO 2023198235	LAEMPE MOESSNER SINTO GMBH	Method for producing a 3D structure in a 3D printing method
WO 2023208482	SIEMENS AG	Method for producing an object in layers, 3D printing device, and computer program
WO 2023191625	ULTIMAKER BV	Designing brims having a wavy pattern
WO 2023200447	HEWLETT PACKARD DEVELOPMENT CO UNIV NANYANG TECH	Confidentiality preserving descriptors
EP 4269001	SIEMENS AG	Method for production of an object in layers, 3D printing device and computer program product



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