

Coche Eléctrico: Boletín Piloto

El pasado 9 de febrero de 2010, la Presidencia española de la UE planteó a los ministros de Industria de los países miembros, reunidos en Consejo Informal en San Sebastián, la conveniencia de que el vehículo eléctrico sea una materia de interés europeo y se apruebe, desde el punto de vista comunitario, una estrategia común para impulsar este tipo de vehículos.

El vehículo eléctrico es una oportunidad para la industria europea. Su implantación conlleva el desarrollo de nuevas tecnologías, actividad innovadora, generación de alto valor añadido, creación de empleo de calidad, posibilidades de potenciar las exportaciones, mejora de la eficiencia y del ahorro de energía, control de las emisiones de CO₂ y reducción de la dependencia del petróleo y sus derivados.

La evolución tecnológica, el desarrollo del mercado y el apoyo político apuntan al incremento de vehículos híbridos y eléctricos en la movilidad del futuro. La realidad del mercado actual parece confirmar estas perspectivas, estando disponibles en el mercado varios modelos de vehículos híbridos con una producción a gran escala. Asimismo, la mayoría de fabricantes de vehículos están desarrollando modelos de vehículos eléctricos.

Desde el punto de vista tecnológico, las principales dificultades se identifican en dos ámbitos fundamentalmente: el desarrollo de sistemas de almacenamiento de energía (baterías fundamentalmente) y la infraestructura de recarga y su integración con el sistema eléctrico.

Los nuevos desarrollos implicarán innovaciones tecnológicas, hecho que se verá reflejado en la solicitud de documentos de patente. Realizar un boletín de vigilancia tecnológica del coche eléctrico aporta información pública y valiosa a los sectores implicados, ya sea para sus desarrollos actuales o para la identificación de investigaciones futuras.

El boletín, de periodicidad trimestral, recoge las publicaciones más recientes de solicitudes internacionales de patente (solicitudes PCT) publicadas en el trimestre inmediatamente anterior. Se ha restringido el ámbito de este boletín a solicitudes PCT por considerarse que al ser éstas solicitudes con las que las empresas pretenden proteger sus invenciones en distintos países, se corresponden con invenciones de una cierta relevancia tecnológica.

Este boletín piloto se centra en las tecnologías de almacenamiento e infraestructura, al haber sido identificados como elementos clave en el desarrollo futuro del vehículo eléctrico, descartando desarrollos relacionados con pila de combustible. Dentro de las tecnologías de almacenamiento, las baterías son las de mayor relevancia, si bien se han incluido también referencias relacionadas con supercondensadores y sistemas de recuperación de energía, por ejemplo frenado regenerativo. Sin embargo, no se descarta incluir otras tecnologías vehiculares en futuros boletines, a medida que se alimente de las opiniones y comentarios de los especialistas a los que va dirigido el boletín.

Solicitudes de Patente Publicadas

Los datos que aparecen en la tabla corresponden a una selección de las solicitudes de patentes publicadas durante el trimestre. Se puede acceder al documento completo haciendo doble clic sobre el mismo.

SISTEMAS DE ALMACENAMIENTO DE ENERGÍA

Nº PUBLICACIÓN SOLICITANTE CONTENIDO TÉCNICO

Baterías

WO2009115875 A1	TOYOTA JIDOSHA KK	Vehículo híbrido adaptado para circular en áreas de mucha altitud, contiene una unidad de control electrónico (ECU) que fija la máxima energía eléctrica descargable desde la batería, teniendo en cuenta la presión atmosférica.
WO2009146876 A1	BEHR GMBH&CO	Dispositivo de enfriamiento para baterías de vehículos eléctricos, contiene elementos de almacenamiento eléctrico en contacto con térmico con el elemento refrigerante, donde el elemento refrigerante comprende canales diseñados con aluminio extruido.
WO2009151192 A1	LG CHEM LTD	Alojamiento para paquetes de baterías de vehículos eléctricos, contiene espacios de flujo que se extienden desde la entrada del líquido refrigerante hasta los elementos de salida, de modo que los terminales están inclinados con un ángulo preestablecido.

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Supercondensadores

WO2009119235 A1	KOMATSU KK	Módulo condensador para dispositivo de almacenamiento eléctrico utilizado en vehículo híbrido, que presenta unidad de radiación de calor con agujero roscado para roscar la placa metálica unida a las celdas del condensador, y trayectoria de paso para agua de enfriamiento en su parte trasera.
WO2009125540 A1	PANASONIC CORP	Dispositivo de almacenamiento de energía, p. ej. condensador electroquímico, montado sobre dispositivo electrónico o vehículo eléctrico, que contiene nanotubos de carbono en el conductor eléctrico cuyo extremo en la región de unión es empujada a los laterales para cubrir la región desacoplada.
WO2009127451 A2	BOSCH GMBH ROBERT	Dispositivo de suministro de energía de emergencia, p.ej. condensador de doble capa, para su uso en sistemas de suministro de energía de vehículos híbridos, que tiene almacenamiento de energía acoplado eléctricamente con batería de alto voltage y/o bajo voltage para su carga y proveer suministro de energía de emergencia.

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Sistemas de recuperación de energía, p.ej. frenos regenerativos

WO2009115358 A2	BOSCH GMBH ROBERT	Método de frenado regenerativo de vehículos a través de máquinas eléctricas, que implica determinar la capacidad de absorción de la línea eléctrica o del almacenamiento de energía asociado
WO2009141646 A1	TOROTRAK DEV LTD	Sistema de recuperación de energía cinética para transmisión de vehículo a motor, contiene una disposición de engranajes con desviación de entrada unido al variador de entrada y otra disposición con desviación de entrada unida al variador de salida, y una desviación de salida unida a un volante de inercia
WO2009132720 A1	BOSCH GMBH ROBERT	Método para el control combinado de una máquina eléctrica y un sistema de bomba, implica proveer de un par de frenado total, que se aplica con la máquina eléctrica y el sistema de bomba

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INFRAESTRUCTURAS DE CARGA

Nº PUBLICACIÓN SOLICITANTE CONTENIDO TÉCNICO

Recarga de baterías

WO2009139277 A1	TOYOTA JIDOSHA KK	Vehículo híbrido, p. ej. vehículo híbrido enchufable, que tiene unidad de control electrónica (ECU) para el cargador que controla como tal que la energía eléctrica que alimenta desde el cargador hacia el bloque de calefactado se prioriza frente a la carga del aparato de almacenamiento eléctrico.
WO2009131923 A2	GM GLOBAL TECHNOLOGY	Sistema de carga de la batería solar para vehículo eléctrico de rango extendido (EREV), que tiene células fotovoltaicas conectadas con la batería de manera que el voltaje autorregulador está generado por las células fotovoltaicas.
WO2009144355 A2	FUNDACION CIRCE CENT INVESTIGACION RECUR	Método automático de control de un sistema de transferencia de potencia con acoplamiento inductivo en alta frecuencia, que mantiene la potencia transferida a la carga igual a la nominal con desalineamientos de hasta un porcentaje específico del área del secundario.

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Cambio de baterías

WO2009125414 A2	DAVIDOVITCH J.	Planta de recambio de baterías para vehículos eléctricos, con transferencia de baterías cargadas a la sección de recambio de baterías, y retirada de baterías descargadas para ser recargadas y suministradas a clientes.
WO2009124316 A1	LIVINGSTON A.	Sistema modular de energía eléctrica para vehículo eléctrico híbrido, que tiene un pestillo para enganchar los accesorios de bloqueo de los módulos de energía, y disipadores de calor en contacto con los módulos de energía para eliminar calor de las baterías modulares recambiables.

BATERÍAS

Nº PUBLICACIÓN	SOLICITANTE	CONTENIDO TÉCNICO
WO2009147833 A1	PANASONIC CORP	Non-aqueous electrolyte secondary battery for use as power supply of e.g. digital still camera, has crack formed in porous insulation layer which is formed in bending portion of flat winding type electrode group
WO2009144873 A1	MATSUSHITA DENKI SANGYO KK; PANASONIC CORP	Surface treatment of hydrogen occlusion alloy powder for negative electrode, involves agitating alloy powder containing nickel and magnesium in lithium hydroxide aqueous solution and then in alkali metal hydroxide aqueous solution extended from coolant inlet and outlet ports to battery module
WO2009145017 A1	TOYOTA JIDOSHA KK	Cylindrical type secondary battery used in e.g. hybrid vehicle, has external terminal that is lightly fitted to battery case such that gap is formed between case and gasket while pouring electrolyte solution into case metal hydroxide aqueous solution
WO2009136589 A1	HITACHI MAXELL LTD; KANTO DENKA KOGYO KK	Non-aqueous secondary battery for electronic device, has positive electrode having positive electrode mix layer which contains lithium-containing complex oxide, and non-aqueous electrolyte containing fluorinated nitrile compound metal hydroxide aqueous solution
WO2009139415 A1	NIPPON ELECTRIC GLASS CO; UNIV NAGAOKA TECHNOLOGY NAT UNIV CORP	Crystallized glass for positive electrode material for lithium ion secondary battery, contains specific lithium ion crystals containing fluorinated nitrile compound
WO2009142022 A1	TOYOTA JIDOSHA KK	Battery cell used for, e.g. hybrid vehicle, has internal terminal whose one end projected through hole of main case is crimped and fixed to external electrode terminals provided closer to hole of main case containing fluorinated nitrile compound
WO2009142283 A1	GS YUASA CORP; GS YUASA CORP KK	Positive electrode active material for lithium secondary battery, comprises lithium-iron-cobalt-phosphate metal hydroxide aqueous solution
WO2009134046 A3	SK ENERGY CO LTD	Safety switch for use in charge and discharge system of secondary battery e.g. lithium ion battery, for electric vehicle, has cutting member arranged with adhered cutter, and truncate part arranged above cutting member extended from coolant inlet and outlet ports to battery module
WO2009139585 A2	SK ENERGY CO LTD	Multilayer microporous film useful in a lithium ion secondary battery for a hybrid vehicle, comprises an inner layer, and surface layers battery e.g. lithium ion battery, for electric vehicle, has cutting
WO2009139157 A1	PANASONIC CORP	Active material for positive electrode of non-aqueous electrolyte secondary battery used in e.g. power tool, comprises fine particles of lithium nickel complex oxide with volume density and volume resistivity of preset value member arranged with adhered cutter, and truncate part arranged above
WO2009140199 A3	ENERDEL INC	Battery pack assembly for e.g. electric car, has container housing battery modules, and pressure release device arranged in container for selectively allowing fluid such as gas, to escape beyond container member arranged with adhered cutter, and truncate part arranged above
WO2009132675 A1	SIEMENS AG	Multi-system vehicle transformer, has traction primary and secondary windings, where direct current lies against one traction secondary winding, and electrical component is integrated in closed circuit of auxiliary secondary winding member arranged with adhered cutter, and truncate part arranged above
WO2009134115 A2	GREEN-TECH HOLDINGS SDN BHD	Uninterrupted battery operated generator for use in power station, has controller that controls operation of generator by controlling opening and closing of supply switches, motor switch, charging switches and charger switch member arranged with adhered cutter, and truncate part arranged above
WO2009133652 A1	MATSUSHITA DENKI SANGYO KK; PANASONIC CORP	Manufacturing method of cylindrical battery e.g. nickel hydride storage battery used in e.g. electronic device, involves welding current collection board to battery case using welding electrode having suitable maximal diameter extended from coolant inlet and outlet ports to battery module
WO2009139252 A1	TOYOTA JIDOSHA KK	Discharge control apparatus of lithium ion secondary battery, has discharge control unit that performs control which discharges pulse identical to pulse from lithium ion secondary battery having suitable maximal diameter
WO2009130740 A1	PANASONIC CORP	Lead storage battery for use in e.g. motor vehicle, has covering membrane in gas discharge unit and opening of exhaust path, formed in battery, where gap is formed between bottom wall of periphery of opening and covering membrane identical to pulse from lithium ion secondary battery
WO2009134163 A1	MOSC ELECTROMECH ENG WKS STOCK CO	Method of electric power supply to vehicle loads and system to this end battery, where gap is formed between bottom wall of periphery of
WO2009128220 A1	CALSONIC CORP; CALSONIC KANSEI CORP; NISSAN MOTOR CO LTD	Battery pack for use in motor vehicle e.g. car, has couplers mounted on specific portion of battery module such that catching recesses are arranged in one side of coupler to hold projected pawls arranged in other side of coupler respectively such that ports are inclined at preset angle

WO2009128641 A3	KEFICO CORP	Electrical leakage detecting apparatus for electric vehicle i.e. car, has measurement electric potential units connected between end of detection resistor and car body, where potential units supply electric potential to battery pack other side of coupler
WO2009135578 A1	JOHNSON CONTROLS HYBRID&RECYCLING GMBH	Battery for hybrid vehicle, has housing, and high voltage socket with two electrical poles arranged on housing, where high voltage socket is connected with high voltage plug detection resistor and car body, where potential units supply electric
WO2009129106 A1	HONDA MOTOR CO LTD; UWM RES FOUND INC	Hybrid vehicle i.e. power-split hybrid vehicle, has control system comprising software stored on computer readable medium for establishing power split ratio between electric power source and non-electric power source for defined trip route other side of coupler
WO2009125593 A1	HITACHI METALS LTD	Inner iron type reactor for power supply circuit used in hybrid vehicle, has two magnetically coupled parallel coils which are arranged within metal case filled with mixture of magnetic powder and resin establishing power split ratio between electric power source and
WO2009126797 A1	APPLE COMPUTER INC; APPLE INC	Adaptively charging lithium-ion battery comprises determining lithium surface concentration at interface between transport-limiting electrode and electrolyte separator, controlling charging process and monitoring battery temperature respectively such that ports are inclined at preset angle
WO2009125908 A1	LS MTRON LTD	Negative active material for secondary battery, has core carbon material and carbide layer formed on portion(s) of edge of core carbon material, and having specific surface area ratio and sphericity ratio, in specified value electrode and electrolyte separator, controlling charging process and
WO2009126734 A1	APPLE INC	Adaptively charging lithium-ion battery comprises determining lithium surface concentration at interface between transport-limiting electrode and electrolyte separator of the battery, and calculating charging current or voltage for battery respectively such that ports are inclined at preset angle
WO2009121014 A1	MISSION MOTOR CO	Method for managing modular power source for, e.g. laptop computer, involves comparing operation conditions of selected module and determining modified operation threshold value based on comparison result surface concentration at interface between transport-limiting
WO2009093758 A1	YAZAKI CORP	Module unit for battery case of hybrid motor vehicle has temperature sensor engaged with main body to measure temperature of battery cell and contacts with battery cell when main body is attached to battery cells electrode and electrolyte separator of the battery, and calculating
WO2009122717 A1	PANASONIC CORP	Non-aqueous electrolyte secondary battery e.g. lithium secondary battery for motor vehicle, has positive electrode whose tensile strength is not more than specific value at time of predetermined elongation rate in longitudinal direction cells
WO2009122749 A1	NTT DATA INTELLILINK CORP	Negative-electrode composition used for secondary batteries, comprises mixture of pearlite and carbon in active material having metal oxide as main component, in preset mass content, or includes pearlite and does not include carbon cells
WO2009122933 A1	TOYOTA JIDOSHA KK	Positive electrode for lithium secondary battery, comprises barrier layer having electrically conductive material and water-insoluble polymer(s), formed on positive electrode collector, and positive electrode active material layer electrode and electrolyte separator of the battery, and calculating
WO2009123081 A1	TOYOTA JIDOSHA KK	Winding type battery e.g. cylindrical lithium ion secondary battery used in e.g. mobile phone, has center pin provided with inside and outside clamp portions extended along forward winding direction, where separators are clamped electrode and electrolyte separator of the battery, and calculating
WO2009117871 A1	BYD CO LTD	Preparing cathode material for lithium secondary batteries involves sintering first mixture formed from lithium, iron and phosphorous compounds and carbon additive to form second mixture and sintering the mixture at second temperature separators are clamped
WO2009122991 A1	TOYOTA JIDOSHA KK	Secondary battery system used in hybrid vehicle, computes ratio of variation of voltage of secondary battery with respect to variation of amount of electrical storage of battery, when amount of electrical storage of battery is changed electrode and electrolyte separator of the battery, and calculating
WO2009133262 A1	IFP; IFP ETAB PUBLIC A CARACTERE IND&COMML	Internal state e.g. health state, estimation method for e.g. nickel-metal hydride battery, in hybrid vehicle, involves establishing reference model of electrochemical system, and generating output signal derived from calculation charging current or voltage for battery
WO2009119093 A1	PANASONIC CORP	Manufacturing method of electrode for lithium ion battery used in mobile phone, involves producing several active materials containing oxides of raw material by oxidizing columnar portions nickel-metal hydride battery, in hybrid vehicle, involves establishing
WO2009119271 A1	TOSHIBA KK	Charging method of assembled cell for various battery-powered applications, involves lowering charging current setting value when detected cell voltage reaches predetermined charge termination upper limit voltage signal derived from calculation

WO2009119581 A1	ZEON CORP	Electrode for lead storage battery used in hybrid vehicles, has electrode active material layer that is made of spherical composite grains containing porous carbonaceous material detected cell voltage reaches predetermined charge termination upper
WO2009118914 A1	MITSUBISHI HEAVY IND CO LTD	Non-contact type electric power supply device for, e.g. electric vehicle, has power supply unit and power receiving unit with plate-shaped core whose longer side is arranged along moving direction of moving object limit voltage
WO2009116284 A1	MATSUSHITA DENKI SANGYO KK; PANASONIC CORP	Non-aqueous electrolyte secondary battery for plug-in hybrid electric vehicle, includes positive electrode containing positive electrode active material, negative electrode, separator and non-aqueous electrolyte charging current or voltage for battery
WO2009115881 A3	TOYOTA JIDOSHA KK	Film transport apparatus for use in e.g. hybrid car, has tension detecting unit detecting tensions applied near left and right ends of film, and control unit changing feedback control based on left and right tension difference charging current or voltage for battery
WO2009117016 A1	ZERO EMISSION SYSTEMS INC	Method of retrofitting vehicle, involves coupling control unit to motor generator and battery for switching operation of vehicle in internal combustion engine mode and electric traction mode detecting unit detecting tensions applied near left and right ends of
WO2009112175 A1	BATTERY CONSULT SAGL	Electrical charging or discharging device, particularly for partially electrically driven vehicles, has control unit provided to perform autonomous charging or discharging or transitioning into ready mode detecting unit detecting tensions applied near left and right ends of
WO2009120294 A1	LIGHTNING ENERGY	Modular battery mounted in electric vehicle, has compressible interconnector arranged between planar surfaces for electrically connecting planar electrode surfaces film, and control unit changing feedback control based on left and
WO2009116495 A1	KOMATSU KK; KOMATSU SEISAKUSHO KK	Method for determining deterioration state of storage apparatus e.g. capacitor in hybrid machine, involves comparing capacitance computed based on motor speed and torque value and charging time and voltages, with reference capacitance charging current or voltage for battery
WO2009115719 A2	PEUGEOT CITROEN AUTOMOBILES SA	Engine assembly i.e. heat engine assembly, controlling method for hybrid vehicle, involves supplying alternator with voltage equal to specific times of normal voltage by using storage of energy, and driving heat engine in engine mode with reference capacitance
WO2009113281 A1	MATSUSHITA DENKI SANGYO KK; PANASONIC CORP	Electric power supply apparatus for electronic device in motor vehicle, has open portion provided between each power supply element and fire extinguisher tank for sensing heat of electric power supply element and opening tank charging current or voltage for battery
WO2009113592 A1	ZEON CORP	Electrode for hybrid capacitors, has electrode layer containing binder and electrode active material which is bonded with the composite particle using binder vehicle, has open portion provided between each power supply element
WO2009146196 A1	ENERDEL INC	Battery assembly for electric vehicle, has co-planar surface that is supported by terminal edges which are oriented in parallel with housing to increase and decrease temperature of prismatic cells and fire extinguisher tank for sensing heat of electric power supply

SUPERCONDENSADORES

Nº PUBLICACIÓN	SOLICITANTE	CONTENIDO TÉCNICO
WO2009144872 A1	PANASONIC CORP	Rush current preventive circuit of charger for lead storage battery mounted in electric vehicle, has resistor that is connected in series with capacitor connected in parallel to output terminal of charger
WO2009133899 A1	ASAHI GLASS CO LTD	Non-aqueous electrolyte for secondary battery, contains lithium salt, specific hydrofluoroether compound and specific glyme-based solvent with capacitor connected in parallel to output terminal of charger
WO2009136483 A1	HITACHI CHEM CO LTD	Power supply device for vehicle such as hybrid vehicle, has switching element that limits charging current and discharge current with respect to capacitor based on detection of temperature and voltage of capacitor
WO2009137752 A2	IOXUS INC; RENEWABLE ENERGY DEV INC	Electrode for use in electric double layer capacitor used for e.g. notebook computer, has binder comprising polymer emulsion that is dispersed in water and water-soluble polymer mixture, and surfactant for enhancing fluidity of slurry
WO2009134707 A2	UNIV TEXAS SYSTEM; RUOFF R S; STOLLER M	Electrochemical device used for hybrid power system, has chemically modified graphene sheet which is arranged in at least portion of chemically modified graphene electrode
WO2009130101 A1	AKWA GMBH	Method for withdrawing current from all types of electrochemical power sources in electric vehicle, involves producing frequency impulses by switching element and withdrawing current using produced frequency impulses chemically modified graphene electrode
WO2009122908 A1	UBE IND LTD	Non-aqueous electrolyte used for lithium secondary battery and electrical double layer capacitor, is obtained by dissolving electrolytic salt in non-aqueous solvent, and contains specified amount of carboxylate ester compound frequency impulses

SISTEMAS DE RECUPERACIÓN DE ENERGÍA; FRENOS REGENERATIVOS

Nº PUBLICACIÓN	SOLICITANTE	CONTENIDO TÉCNICO
WO2009147964 A1	HITACHI LTD	Brake system for use in e.g. front engine front drive vehicle, outputs braking force signals to actuators, to control braking forces output by brake calipers, based on reaction force of pedal and amount of displacement of piston
WO2009144064 A1	BOSCH GMBH ROBERT	Towing torque regulating method for motor vehicle, involves allowing regulating device to adapt towing torque of electric motor of motor vehicle as function of friction value by computing device displacement of piston
WO2009139146 A1	TOSHIBA KK	Electric vehicle control apparatus has free-wheeling diode connected in parallel with chopper unit and in series with electric power storage unit for introduction of electric power from storage unit to power converter

RECARGA DE BATERÍAS

Nº PUBLICACIÓN	SOLICITANTE	CONTENIDO TÉCNICO
WO2009131336 A3	KOREA ADV INST SCI&TECHNOLOGY (SKSK) SK ENERGY CO LTD	Two-stage charge equalization apparatus for battery string of hybrid vehicle, has microprocessor that controls charging of each battery cell connected in series of each of several modules formed by dividing single battery string
WO2009113530 A1	SANYO ELECTRIC CO LTD	Charging state equalization apparatus of assembled battery system in hybrid vehicle, has discharge circuit whose discharging process is completed, when charge state evaluation value reaches derived discharging completion value
WO2009120369 A2	TESLA MOTORS INC	Multi-mode battery charging and operating system for e.g. electric vehicle, has battery charging system for charging battery pack of electric vehicle, and battery cooling system for cooling battery pack of electric vehicle single battery string