FIRST PRINCIPALS
Technology Transfer & Commercialization

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AIST Available Patents

Biomedical

#	Patent #	TITLE	Unique Features
1	6015434	Artificial heart pump	Centrifugal artificial heart pump with reduced number of parts; e.g. rotor is suspended in a noncontacting state by magnetic force.
2	6420171	Leukemic cell-adsorbing material containing lectin protein from Agrocybe cylindracea or jequirity plant seed	Provides advantage of treating only affected cells in the blood, external to the body; e.g. via transfusion and/or dialysis. Related to US 6,987,022, which uses similar method with alternative source of lectin protein from Dolichos beans or soybeans.
3	6465512	Leukemic cell growth inhibiting method	Methylsulfinylalkyl isothiocyanate therapeutic for leukemia derived from certain plants in the Cruciferae family. Inhibits growth of leukemic cells, yet has little effect on normal cells.
4	6987022	Leukemic cell-adsorbing material containing lectin protein from dolichos beans or soybeans	Provides selective separation of leukemic cells from the patient's blood by means of a novel adsorbent material extracted from a specific mushroom fungus such as Agrocybe cylindracea or beans of Dolichos biflorus, referred to as Dolichos beans. The leukemic cell-adsorbing column is a tubular body made of an insoluble and physiologically inert material holding a bed of the leukemic cell-adsorbent material defined above.

Biotechnology

#	Patent #	TITLE	Unique Features
5	6387664	SPARC fusion protein and method for producing the same	Economical production of SPARC protein for use in inhibiting nerve cell adhesion, which causes nerve cell migration. Also useful in neuroscience research for promoting neurite degeneration to cause neuroplasticity.
6	6342367	Method for the preparation of chondroitin sulfate compounds	Cost effective method of preparing chondroitin sulfate from waste fish scales. No particular limitation as to the kind of fish; e.g., both freshwater and saltwater fish are acceptable. Chondroitin sulfate is a major constituent of cartilage and consumed by some for its presumed benefit in easing joint pain.
7	6143533	Method for the preparation of N-glycolyl neuraminic acid from Cucumaria echinata	Efficient and economical preparation of N-glycolyl neuraminic acid from an echinodermatous marine animal, Cucumaria echinata, which is typicaly discharged as waste from fisheries. Sialic acid is a generic term for the N- or O-substituted derivatives of neuraminic acid, a nine-carbon monosaccharide. N-glycolyl neuraminic acid is found in certain cancer cells and is becoming of interest as a cancer marker.

Data Storage-Optical

#	Patent #	TITLE	Unique Features
8	6197460	Rewritable, heat sensitive, color image recording medium and image recording method using same	A rewritable, heat sensitive recording medium adapted for providing a color image. The recording medium consists of a pair of opposed sheets, films, or plates with a heat-sensitive layer between them. Each of the substrates may be flat or curved and may be rigid or flexible. At least one of the substrates is transparent, and may be a plastic material or glass. The opaque substrate may be made of paper, metal or plastic material.
9	6132524	Semiconductor magneto-optical material	A semiconductor magneto-optical material that exhibits pronounced magneto-optical effect at room temperature in a desired wavelength region and can be formed as a thin film.
10	6103431	Rewritable, color image recording medium and image recording method using same	A rewritable recording medium with a cholesteric liquid crystal and photochromic compound as a heat-sensitive, intermediate layer to enable a color image.
11	6808740	Magnetoresistance effect film and method of forming same	Film that uses the magnetoresistance effect to record and read information or to detect weak magnetic fields. Exhibits a magnetoresistive effect of 73,000% at room temperature and 4,000,000% at -20 deg C.
12	6613448	Magnetoresistance effect film and method of forming same	MR effect film with GaAs substrate embedded with MnSb particles that uses the magnetoresistance effect to record and read information or to detect weak magnetic fields.
13	6610421	Spin electronic material and fabrication method thereof	Unique spin electronic material that exhibits a spin-dependent electronic effect. The material is a TE-VE zincblende structure, where TE is V, Cr, or Mn and VE is As or Sb.

Data Storage-Optical

#	Patent #	TITLE	Unique Features
15	6524759	Reversible recording medium, and reversible recording method and apparatus using the same	Reversible recording medium, method, and apparatus using a cholesteric, liquid crystalline material. Provides the capability of forming multi-color images with high contrast, and on a paper-like background, the images are formed with high degree of whiteness.
16	6183666	Cholesteryl compound and rewritable full-color thermosensitive recording material	Cholesteryl compound with liquid crystalline properties that enables full-color and rewritable recording simultaneously.

Materials-Composites

#	Patent #	TITLE	Unique Features
17	6240786	Two-layer structure composite material for detecting cracks	A two-layer structure composite material, by which it is possible to detect crack and to predict possible destruction before it actually occurs, and which can be used for a structural material with complicated shape, for a structural material with no additional space for providing a sensor or for a structural material in which the sensor cannot be mounted because it is rotating at high speed.
18	6555886	Device having two perovskite crystalline layers that shows hysteresis and piezoelectric behavior	A novel multilayered electronic device having long-term stability of which the working element has a multilayered structure of a PZT perovskite as formed with orientation on a substrate material which is not particularly limitative including single crystal materials as well as polycrystalline ceramic materials and amorphous materials and also to provide a method for the preparation of such a multilayered electronic device.
19	6071997	Three-dimensionally connected silica spheres-resin composite and method for production thereof	A three dimensionally connected silica spheres-resin composite, which, in spite of its high silica content, shows no tendency toward sudden rigidity loss at temperatures above the glass transition temperature and has good high temperature stability.
20	6536476	Flow rate-controlling method and microvalve therefor	A novel flow rate-controlling method in fine flow channels without using any mechanical members or any special materials but by utilizing the property changes of the liquid per se flowing through the flow channels.
21	7152482	Piezoelectric sensor and input device including same	Provides a transparent piezoelectric sensor constructed from transparent piezoelectric films, resulting in an inexpensive piezoelectric sensor having an excellent durability and a simple structure.
22	7060371	Mechanoluminescence material, producing method thereof, and usage thereof	A mechanoluminescence material with high luminescence intensity, made from a combination of alumino silicate, aluminate, silicate, tantalate, niobate, gallium oxide, and zirconium dioxide materials
23	6902806	Mesoporous silica having controlled-release on-off control function, production method thereof and method using same	A mesoporous silica having a hexagonal structure, capable of controllably releasing a substance incorporated therein, and a production method.
24	6823739	Thin pressure sensor and biological information measuring device using same, and biological information measuring method	A novel thin pressure sensor that has a simple and thin structure with sufficient durability and sufficient mechanical strength. One embodiment is a novel biological information measuring device that uses the pressure sensor which improves on conventional biological information measuring devices.
25	6628375	Method of and a system for measuring a stress or a stress distribution, using a stress luminescent material	A method and a system which, by making use of a stress luminescent material, renders it possible to directly observe a stress distribution on the base of a real time without using a cord, and to easily measure a stress or a stress distribution and a stress image.
26	6608427	High-sensitivity flexible ceramic sensor	A novel high-sensitivity ceramic sensor having high resistance against mechanical and thermal shocks to exhibit a high sensitivity with stability.
27	5900450	Three-dimensionally connected silica sphere-resin composite and method for production thereof	A three dimensionally connected silica spheres-resin composite, which, in spite of its high silica content, shows no tendency toward sudden rigidity fall at temperatures above the glass transition temperature and has good high temperature stability.
28	5656250	Three-dimensional network structure comprising spherical silica particles and method of producing same	A three-dimensional network structure comprising spherical silica particles, which, in spite of its high silica content, shows no tendency toward sudden rigidity fall at temperatures above the glass transition temperature and has good high temperature stability.
29	5304243	Method of producing organic group modified silica particles	The addition of an alkoxy-silane having a specific organic functional results in the production of silica particles having a specific organic modifier group and that these silica particles dramatically improve the properties of resin products in which they are used as filler.

Materials-Fibers

#	Patent #	TITLE	Unique Features
30	5773834	Method of forming carbon nanotubes on a carbonaceous body, composite material obtained thereby and electron beam source element using same	A method of producing a composite material which has carbon nanotubes formed on a surface of a shaped carbonaceous body and which can be used as such for the construction of an electron beam source element.
31	6187391	Method for modifying one surface of textile fabric or nonwoven fabric	Low-temperature plasma treatment on one surface of a textile fabric or a nonwoven fabric provides polymerization "seed" to enable imparting a practical difference in function between front and back surfaces.
32	5858152	Method for production of composite material and composite material produced thereby	Rotating, fiber separating and throwing roller combines reinforcing fibers and thermoplastic resin fibers to form a composite mat. Produces strong, yet light-weight, void-filled foam composite material produced upon heating.
33	5537718	Method for production of material for composite article	A mixed matrix of thermoplastic resin fibers and reinforcing fibers woven such that the mixing ratio varies in the direction of thickness of the material. Thermoplastic component is typically polyamide (Nylon), polypropylene, polyethylene, or polyethylene terephthalate fibers. Reinforcing fibers are at least one of glass, carbon, or aramid fibers.
34	5242768	Three-dimensional woven fabric for battery	Three-dimensional woven fabric with component fibers interlaced in the X, Y, and Z directions and to be used for a battery.
35	4984340	Method and apparatus for sewing together pieces of cloth with jet streams	Unique approach to joining cloth without thread. Uses a high-pressure jet of fluid to intertwine and weave fibers of cloth together efficiently, securely, and safely. A retractable shielding plate enables the sewing to stop and start instantaneously. Additional features include: - Device to hold the pieces of cloth together. - Water streams compressed to pressures between 300 and 1000 kgf/cm2. - Nozzle diameters between 0.01 and 0.05 mm. - Covering unit to suction and remove excess water from material while it is being sewn together. - Jet streams are directed from opposite sides to the same point of contact on the cloth pieces to intertwine the fibers.

Materials-Films

#	Patent #	TITLE	Unique Features
36	6036773	Method for growing Group III atomic layer	A new method suitable for forming semiconductor quantum nanostructures including at least a Group III atomic layer which is little affected by substrate pattern density, tolerates size fluctuation to a high degree, and enables Group III atomic layers to be formed properly only as monolayers.
37	5789337	Material having ultrafine gold particles immobilized thereon and method for production thereof	A material having ultrafine gold particles immobilized thereon and a method for the production thereof. It further relates to an oxidizing catalyst which is formed of the material.
38	6284314	Porous ceramic thin film and method for production thereof	A method for the production of a porous ceramic thin film, which comprises depositing a ceramic sol containing at least one member selected from the group consisting of polyethylene glycol and polyethylene oxide in the form of a film on a substrate and then heating the substrate for firing the film and producing on the substrate a porous ceramic film having micropores of uniform diameter and to a porous ceramic thin film produced by this method.
39	6132568	Manufacturing method of samarium sulfide thin films	A method for producing a samarium monosulfide piezochromic thin film. (A piezochromic phenomenon is one in which the optical properties of a material change reversibly according to a change of pressure.) SmS undergoes a semiconductor-to-metal isostructural phase transition at 0.65 MPa and exhibits piezochromic characteristics. When a thin film of SmS is used, for example, as a window coating material, it becomes possible to automatically control an energy of incident sunlight to be passed through the window according to a change of circumstantial temperature and stress.
40	5786094	Transparent and conductive ultrathin film and method of producing same	A transparent and conductive ultrathin film comprising a transition metal, as formed on a substrate, with a film thickness of 1 to 200 nm and to a method of producing transparent and conductive ultrathin films which comprises vapor-depositing at least one vaporized transition metal on a substrate in excited state under vacuum to thereby form a thin film made of said transition metal.
41	5763340	Method for production of SiO.sub.2 glass material having regions changed in light refractive index and SiO.sub.2 glass material produced by the method	An SiO.sub.2 glass material having regions changed in light refractive index so as to enable easy formation of such a waveguide structure.

Materials-Films

#	Patent #	TITLE	Unique Features
42	5804255	Method of forming transparent and conductive ultrathin films	A thin film prepared by vapor-depositing at least one vaporized transition metal on a substrate in excited state under vacuum has not only good transparency and conductivity but also suitable environment resistance. Based on this finding, the present invention has been completed.
43	6039847	Method of forming a highly pure thin film and apparatus therefor	Formation of a highly pure thin film by ion beam sputtering. Enables effective semiconductor production and doping at low temperatures; uses cesium ions as the negative ion source.
44	6641937	Transparent conductive film and process for producing the film	Transparent conductive films of indium tin oxide are imparted with particularly good, low resistance properties through addition of small amounts of nitrogen. Enables higher speed and finer display elements for liquid crystalline devices.

Materials-Optical

#	Patent #	TITLE	Unique Features
45	6441217	Ferulic acid derivative	Useful as a liquid crystal material. The ferulic acid derivative is also useful as an ion sensor for medical and environmental analysis, as well as an electrolyte in secondary cells for electric cars, note-size personal computers and portable telephones. The ferulic acid is extracted inexpensively in a large amount from the waste oil of rice bran, which is normally treated as industrial waste. Related to 6,517,739.
46	5858538	Composite luminescent material	A fullerene layer composited with an auxiliary substance layer can produce strong photoluminescence when irradiated with an argon laser beam.
47	6550934	Light emitting device	A device which can emit condensed light from a lamp, condensed fluorescent or phosphorescent light generated by irradiation with a lamp or a laser beam generated by excitation with a flash lamp.
48	6517739	Ferulic acid derivative, and liquid crystal material, cation detecting element, anion detecting element, ion conducting material and electrolyte, each	A liquid crystal. An ion transfer material of a new type which, by introducing a group capable of coordinating with a metal ion to a hydroxyl group of ferulic add, can utilize the two-dimensional state of molecular aggregation to be formed by liquid crystal molecules in the state of liquid crystal.
49	6280655	High-luminosity stress-luminescent material	A novel stress-luminescent material capable of efficiently emitting luminescence when stressed by receiving a mechanical stimulation such as rubbing, shearing, impact, compression, tension and the like even in the absence of any conventional stimulations such as ultraviolet light, electron beams, X-rays, ionizing radiations, electric fields, chemical reactions and so on.
50	6159394	Stress emission material and its manufacturing method	The inventors have determined the appropriate amount of emission center added to a base material with an FeS.sub.2 structure and a doping method therefor, thereby succeeding in significantly improving the efficiency in converting mechanical energy into optical energy.
51	6117574	Triboluminescent inorganic material and a method for preparation thereof	A synthetic inorganic triboluminescent material capable of emitting luminescence of an intensity suitable for practical applications when excited with mechanical energy as well as to provide a method for the preparation thereof.
52	6413447	Photoconducting silicon complexes, liquid crystal materials, composition thereof, and elements using same	A electron transferring material formed by a novel porphyrin silicon complex and a use thereof as a photo-functional charge-transfer material.
53	6299844	Photochemical reactor	Compact photochemical reactor with improved irradiation efficiency for carrying out photoreactions including photosynthesis, photodecomposition, photoreduction, photooxidation, photocatalytic reaction, photosterilization, photocleaning, photoheating, photodeodorization or photocuring. Does not require to be in a vacuum chamber or in an oxygen-free chamber even when vacuum ultraviolet rays are to be used for the intended photochemical reaction.
54	6169288	Laser ablation type ion source	A laser ablation type ion source which enables efficient extraction of ions from a solid raw material, is small in size, and is easy to adjust.
55	6339954	Method of analyzing concentration of target substance using quartz oscillator and device therefor	Use of a quartz oscillator to quantitatively analyze the concentration of a target substance contained in a liquid or gas without the need for pretreatment.

Processes-Industrial

#	Patent #	TITLE	Unique Features
56	6531187	Method of forming a shaped body of brittle ultra fine particles with mechanical impact force and without heating	A method of forming a film or a micro structure with high density and high strength by bonding brittle ultra fine particles (e.g. ceramics or metals) without heating them. Uses a combination of mechanical impact and sintering temperature to affect the particle bonding. Similar to 7153567, AIST-6827634 and AIST-6991515. Also published as 2002/0071905.

Processes-Industrial

#	Patent #	TITLE	Unique Features
57	6991515	Ultra fine particle film forming method and apparatus	Application of micro-particles in extremely smooth films of uniform density. Particles may be ceramic, metal, or other materials of about 1 micron in size. Related to 6,827,634.
58	6827634	Ultra fine particle film forming method and apparatus	Ultra fine particle film forming ensures particles are sufficiently bonded together and planarized on the substrate. Related to 6,991,515
59	6294224	Method for arranging of non-magnetic substance	Arranging micro-sized, non-magnetic particles (e.g. diamonds for precise micro-grinding applications) by coating with magnetic fluid and precisely locating them by applying a uniform, magnetic field.
60	6280802	Method of forming film of ultrafine particles	Formation of a film of ultrafine particles using a high-speed, high-energy beam. Produces films of superior density and adhesion.
61	5805971	Method of producing three-dimensional forms	Repeatedly depositing on a base surface layers of particles of materials having different properties by spraying from at least one nozzle a gas including the particles, to thereby build up a three-dimensional object by accumulating deposition layers, each having different properties in a two-dimensional plane. Particles of various materials are deposited with high precision to produce three-dimensional forms having good mechanical strength and electrical and optical functions.
62	5424834	Optical displacement sensor for measurement of shape and coarseness of a target workpiece surface	Optical displacement sensor for measurement of shape and coarseness of a target workpiece surface. Provides high-sensitivity and high precision, unaffected by the target surface inclination.
63	5368898	Method of generating micro-topography on a surface	Provides micro-topography on a surface by use of a magnetic fluid. Useful for fabricating surface roughness master specimens, various types of holographic optical elements, master optical disks, and diffraction gratings, as well as for micromachining.