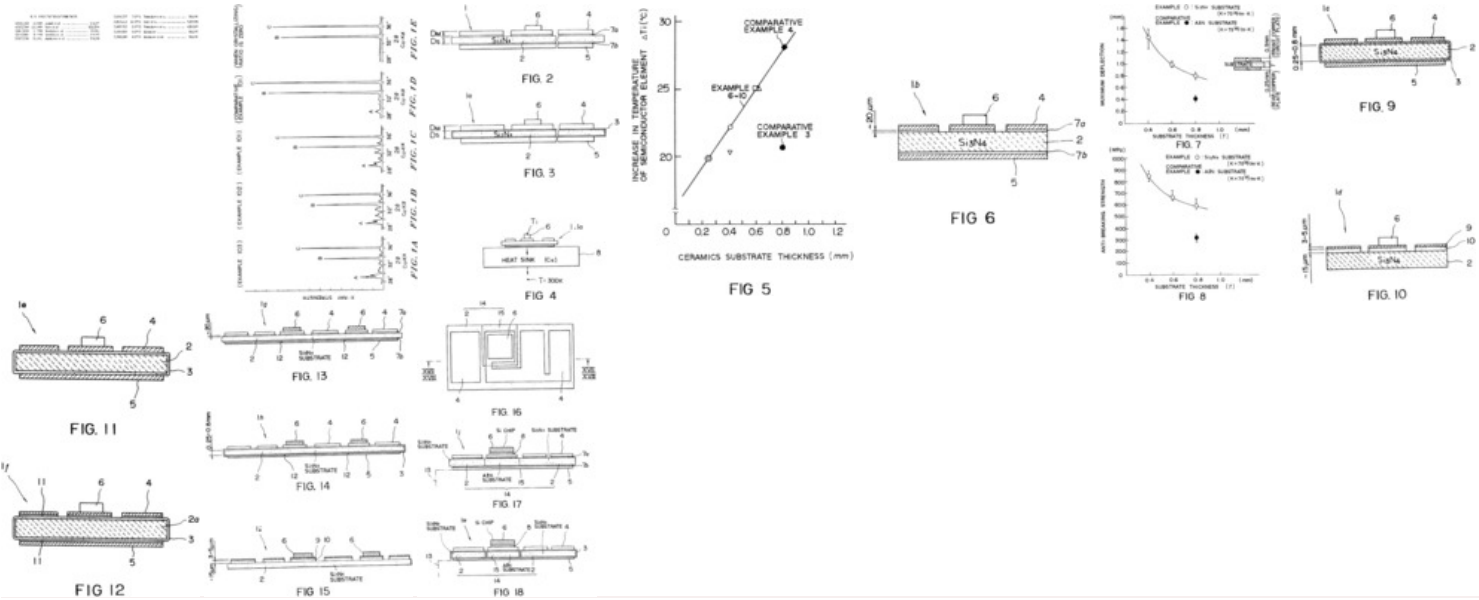


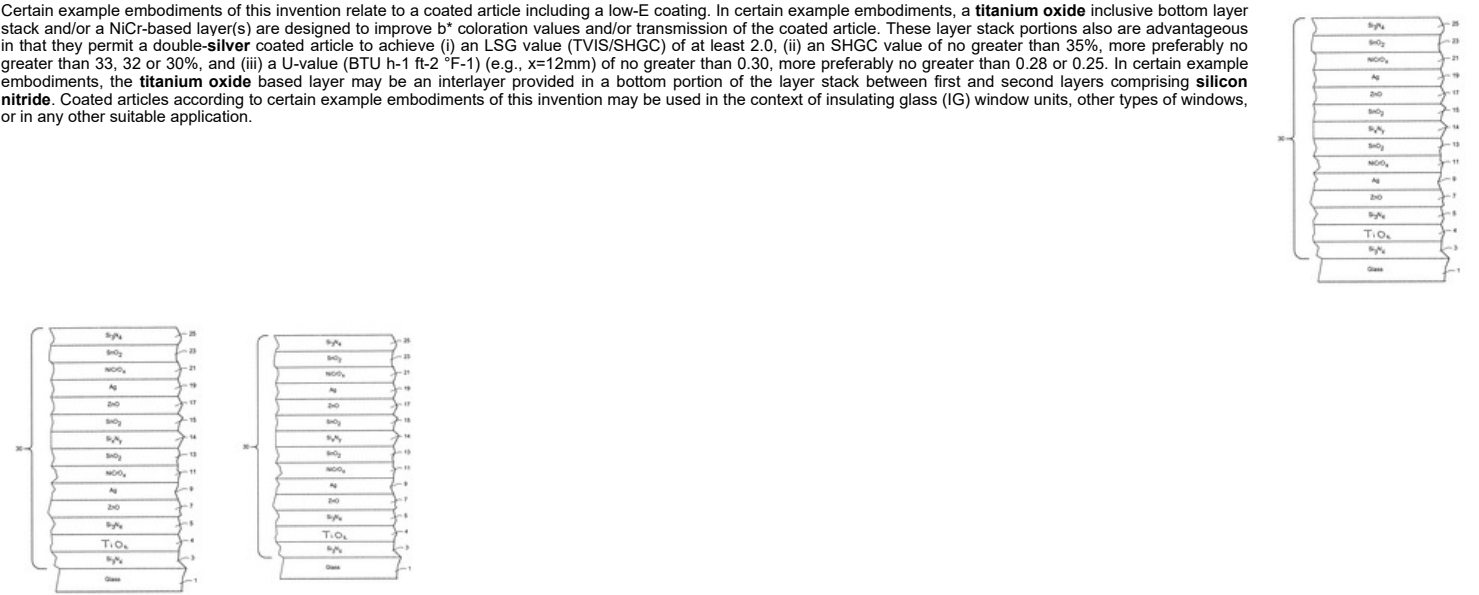
#	Title	Publication number	1st app. date	Applicant/Assignee	1st publ. date	Publ. date
1.	Silicon nitride circuit board	WO9629736	1996-03-19	KOMATSU TOSHIBA*	1996-09-26	1996-09-26

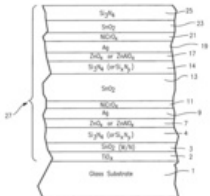
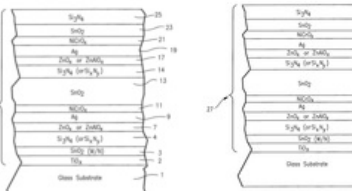
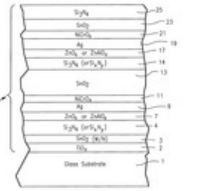
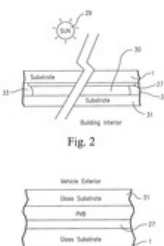
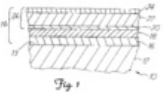
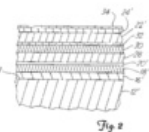
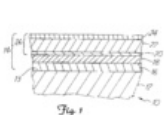
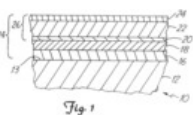
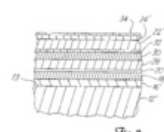
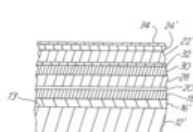
This invention provides a **silicon nitride** circuit board in which a metal circuit plate is bonded to a high thermal conductive **silicon nitride substrate** having a thermal conductivity of not less than 60 W/m K, wherein a thickness DS of the high thermal conductive **silicon nitride substrate** and a thickness DM of the metal circuit plate satisfy a relational formula $DS \leq 2DM$. The **silicon nitride** circuit board is characterized in that, when a load acts on the central portion of the circuit board which is held at a support interval of 50 mm, a maximum deflection is not less than 0.6 mm until the **silicon nitride substrate** is broken. The **silicon nitride** circuit board is characterized in that, when an anti-breaking test is performed to the circuit board which is held at a support interval of 50 mm, an anti-breaking strength is not less than 500 MPa. The metal circuit plate or a circuit layer are integrally bonded on the **silicon nitride substrate** by a direct bonding method, an active metal brazing method, or an metalize method. According to the **silicon nitride** circuit board with the above arrangement, high thermal conductivity and excellent heat radiation characteristics can be obtained, and heat cycle resistance characteristics can be considerably improved. <IMAGE>

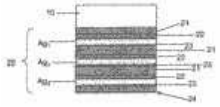
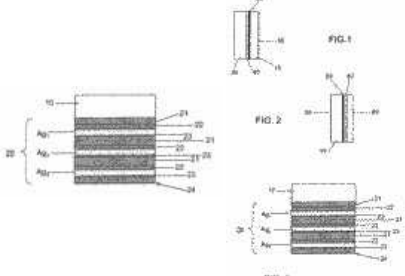
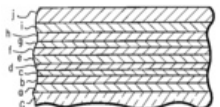
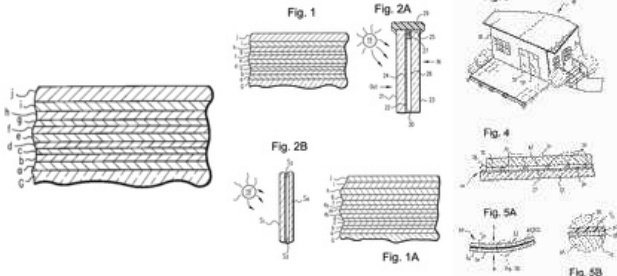


2.	Coated article with low-e coating having titanium oxide layer and/or nirc based layer(s) to improve color values and/or transmission, and method of making same	WO2010126564	2009-04-29	GORE GUARDIAN INDUSTRIES SERIES GUARDIAN GLASS* GUARDIAN INDUSTRIES	2010-11-04	2010-11-04
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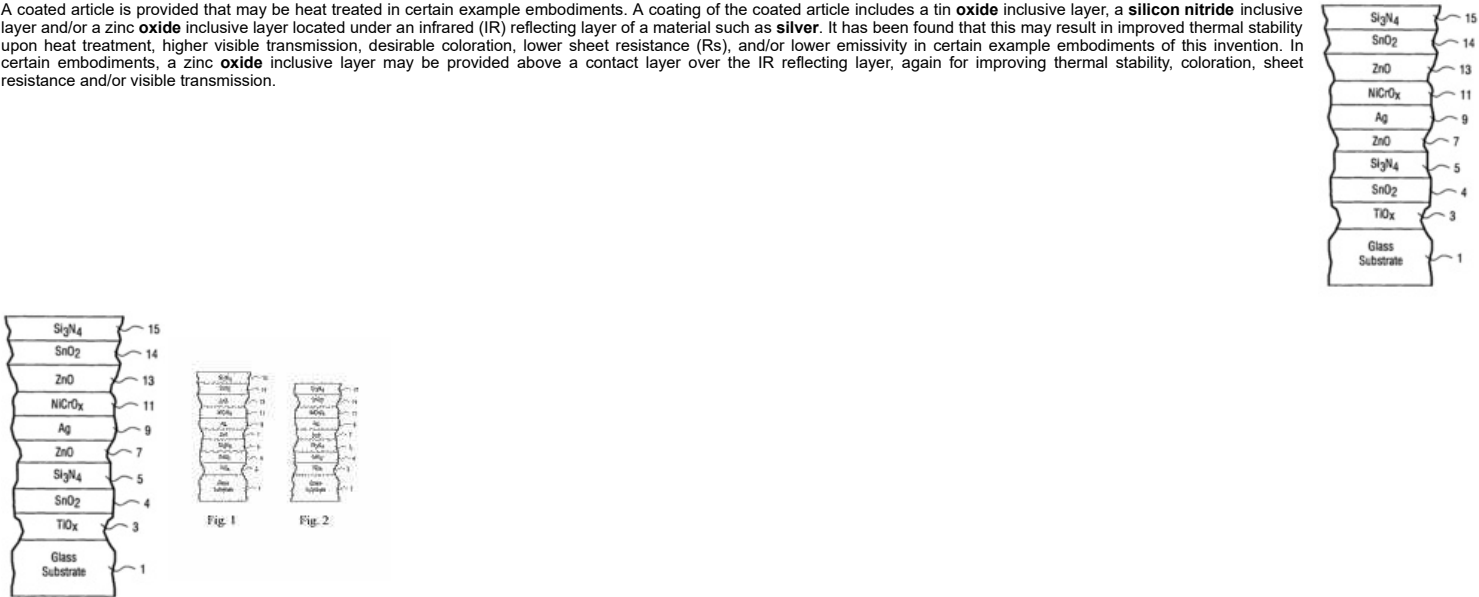
Certain example embodiments of this invention relate to a coated article including a low-E coating. In certain example embodiments, a **titanium oxide** inclusive bottom layer stack and/or a NiCr-based layer(s) are designed to improve b* coloration values and/or transmission of the coated article. These layer stack portions also are advantageous in that they permit a double-silver coated article to achieve (i) an LSG value (TVIS/SHGC) of at least 2.0, (ii) an SHGC value of no greater than 35%, more preferably no greater than 33, 32 or 30%, and (iii) a U-value (BTU h-1 ft-2 °F-1) (e.g., x=12mm) of no greater than 0.30, more preferably no greater than 0.28 or 0.25. In certain example embodiments, the **titanium oxide** based layer may be an interlayer provided in a bottom portion of the layer stack between first and second layers comprising **silicon nitride**. Coated articles according to certain example embodiments of this invention may be used in the context of insulating glass (IG) window units, other types of windows, or in any other suitable application.



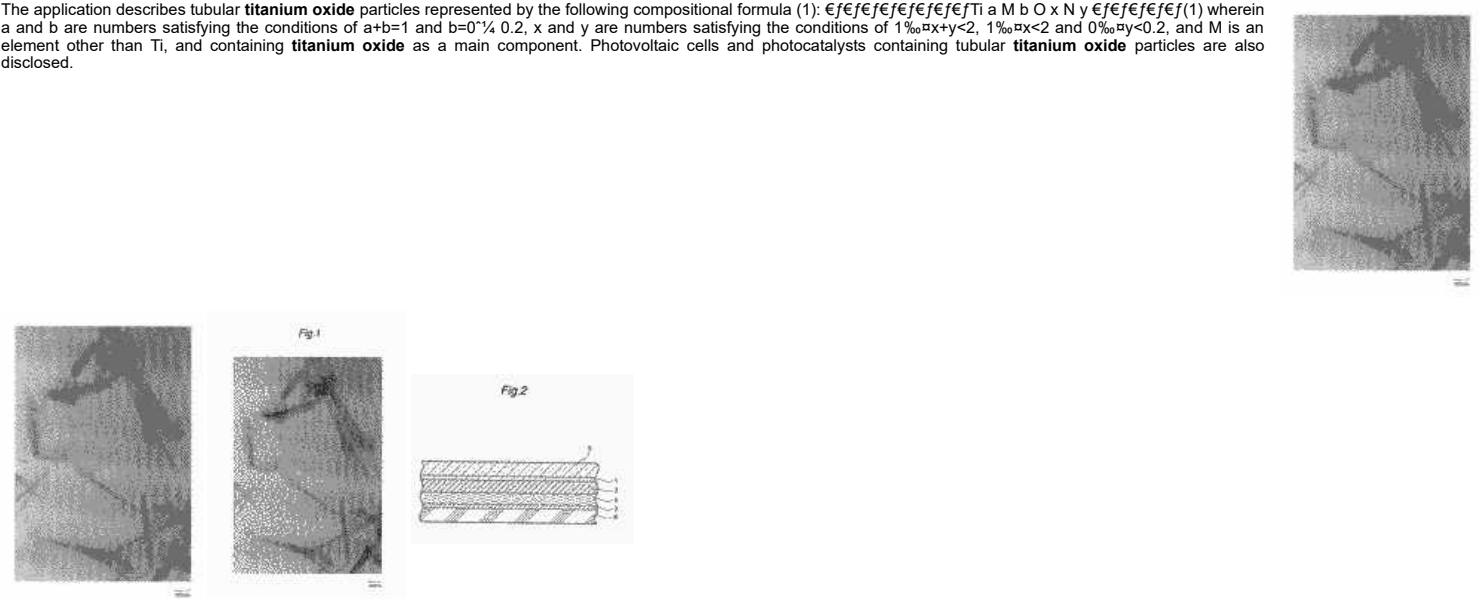
3.	Silicon nitride ceramic substrate and silicon nitride ceramic circuit board using the substrate	EP1201623	2001-10-05	TOSHIBA* TOSHIBA ELECTRONIC ENGINEERING	2002-05-02	2002-05-02
The present invention provides a silicon nitride ceramic substrate composed of a silicon nitride sintered body in which maximum size of pore existing in grain boundary phase of the sintered body is 0.3 μm or less, and having a thermal conductivity of 50W/mK or more and a three point bending strength of 500MPa or more, wherein a leak current is 1000nA or less when an alternative voltage of 1.5kV-100Hz is applied to a portion between front and back surfaces of the silicon nitride sintered body under conditions of a temperature of 25 DEG C and a relative humidity of 70%. According to the above structure of the present invention, there can be provided a silicon nitride ceramic substrate capable of effectively suppressing a leak current generation when the above substrate is assembled into various power modules and circuit boards, and capable of greatly improving insulating property and operative reliability of power modules in which output power and capacity are greatly increased.						
  						
4.	Heat treatable coated article with tin oxide inclusive layer between titanium oxide and silicon nitride	US20050042459	2003-08-22	CENTRE LUXEMBOURGEOIS DE RECHERCHES POUR LE VERRE & LA CERAMIQUE* GUARDIAN EUROPE S.À.R.L.* GUARDIAN GLASS* GUARDIAN INDUSTRIES	2005-02-24	2005-02-24
A low-E coated article is provided, in certain example embodiments, with a layer including tin oxide provided between a layer including titanium oxide and a layer including silicon nitride. It has been found that the provision of such a tin oxide inclusive layer between silicon nitride and titanium oxide can significantly improve durability of the resulting coated article, especially after heat treatment (HT). In certain example embodiments, the coated article may be formed so as to have a fairly high visible transmission (TV) or Tvis) to sheet resistance (RS) ratio (i.e., a ratio Tvis/RS). Coated articles herein may be used in the context of windows or the like (e.g., laminated vehicle windshields).						
						
  						
5.	Heat-reflecting coating system for transparent substrate, useful as core of laminated glass, with silver between dielectric titanium dioxide and aluminum nitride has metal or partial nitride between silver and n...	DE19858226	1998-12-17	SAINT GOBAIN VITRAGE SEKURIT SAINT GOBAIN DEUTSCH*	2000-06-15	2000-06-15
Heat-reflecting coating system for transparent substrates with at least one functional silver (Ag) layer and dielectric antireflection layers has a lower layer of titanium dioxide (TiO2) and an upper layer of aluminum nitride (AlN) and a 0.1-3 nm thick metal or partial nitride layer to improve the adhesion between the Ag layer and upper antireflection layer.						
6.	Transparent article having protective silicon nitride film	WO9529883	1995-05-02	CARDINAL CG CARDINAL INSULATING GLASS*	1995-11-09	1995-11-09
Transparent articles comprising transparent, nonmetallic substrate and a transparent film stack is sputter deposited on the substrate. The film stack is characterized by including at least one infrared reflective metal film, a dielectric film over the metal film, and a protective silicon nitride film of 10 ANGSTROM to 150 ANGSTROM in thickness over the said dielectric film. The dielectric film desirably has substantially the same index of refraction as does silicon nitride and is contiguous with the silicon nitride film.						
     						

7.	Transparent substrate comprising a stack of thin layers for electromagnetic armour	FR2859721	2003-09-17	SAINT GOBAIN GLASS*	2005-03-18	2005-03-18
The invention relates to a transparent substrate which is made, for example, from glass and which consists of a stack of thin layers (20) comprising three silver layers (Ag1, Ag2, Ag3) and, alternatively, a layer of titanium dioxide (21), a layer of metal oxide (22), one of the silver layers (Ag1, Ag2, Ag3) and a coating layer (23), all of said layers being disposed on the substrate (10). The invention is characterised in that: (i) the metal oxide is zinc oxide, (ii) the coating layer (23) is a sacrificial metal, and (iii) an antireflective layer (24) comprising at least one metal oxide is disposed on the coating layer (23) of the silver layer (Ag3) that is furthest from the substrate.						
8.	Sputtering targets and method for the preparation thereof	GB9600210	1996-01-05	BEKAERT BEKAERT VDS BEKAERT VDS DEINZE BEKERT Å· ADVANCED COATINGS Å· BETH LOTEN Å· FENOTE NOTE CHAP BELGIUM 98 0 0 DANESI A 3 Å· LAHN 7 5 7 9 BIFFA VAN DER STRADEN E CHUTE RETEN DRIVE PEUBA PANDEO SOLERAS ADVANCED COATINGS* VAMDERSTRAETEN VANDERSTRAETEN	1996-03-06	1996-03-06
A process for the preparation of a sputtering target which comprises sub-stoichiometric titanium dioxide, TiOx, where x is below 2 having an electrical resistivity of less than 0.5 ohm.cm, optionally together with niobium oxide, which process comprises plasma spraying titanium dioxide, TiO2, optionally together with niobium oxide, onto a target base in an atmosphere which is oxygen deficient and which does not contain oxygen-containing compounds, the target base being coated with TiOx which is solidified by cooling under conditions which prevent the sub-stoichiometric titanium dioxide from combining with oxygen.						
9.	Coated article with silicon nitride inclusive layer adjacent glass	WO200204375	2001-02-28	CENTRE LUXEMBOURGEOIS DE RECHERCHE POUR LE VERRE & LA CERAM CENTRE LUXEMBOURGEOIS DE RECHERCHES POUR LE VERRE & LA CERAMIQUE GUARDIAN EUROPE S Å· R L* GUARDIAN EUROPE S Å· R L GUARDIAN GLASS* GUARDIAN INDUSTRIES ILNS	2002-01-17	2002-01-17
A low-E coated article is provided, in certain example embodiments, with a layer including silicon nitride adjacent the glass substrate in order to improve chemical and/or mechanical durability of the coated article. In certain example embodiments, the coated article may be formed so as to have a fairly high visible transmission (TY or Tvis) to sheet resistance (RS) ratio (i.e., a ratio Tvis/RS). The higher this ratio, the better the coated article's combined functionality of providing for both good solar performance (e.g., ability to reflect and/or absorb IR radiation) and high visible transmission. Coated articles herein may be used in the context of windows or the like (e.g., laminated vehicle windshields).						
10.	Heat-reflecting coating system for transparent substrate , useful as core of laminated glass, with silver between dielectric titanium dioxide and aluminum nitride has zinc oxide between titanium dioxide an...	DE19858227	1998-12-17	SEKURIT SAINT GOBAIN DEUTSCH*	2000-06-15	2000-06-15
Heat-reflecting coating system for transparent substrates has at least one functional silver (Ag) layer and dielectric antireflection layers comprising an upper layer of aluminum nitride (AlN) and lower layer of titanium dioxide (TiO2). The top 5-15 nm of the thickness of the latter, i.e. next to the silver layer, is replaced by zinc oxide (ZnO) in an optical thickness corresponding to that of the part of the TiO2 layer replaced.						

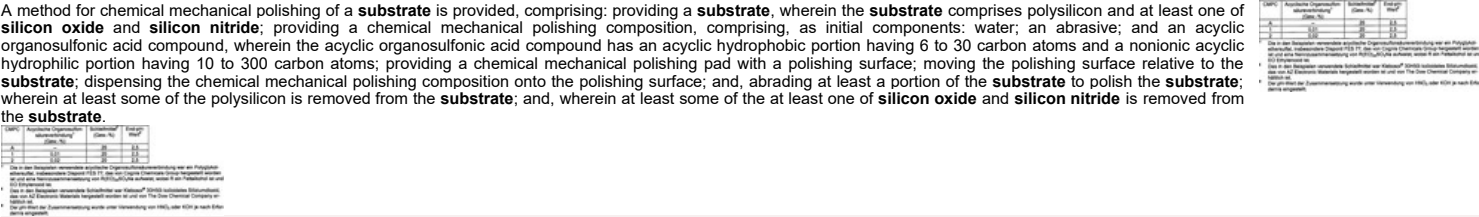
A coated article is provided that may be heat treated in certain example embodiments. A coating of the coated article includes a tin **oxide** inclusive layer, a **silicon nitride** inclusive layer and/or a zinc **oxide** inclusive layer located under an infrared (IR) reflecting layer of a material such as **silver**. It has been found that this may result in improved thermal stability upon heat treatment, higher visible transmission, desirable coloration, lower sheet resistance (Rs), and/or lower emissivity in certain example embodiments of this invention. In certain embodiments, a zinc **oxide** inclusive layer may be provided above a contact layer over the IR reflecting layer, again for improving thermal stability, coloration, sheet resistance and/or visible transmission.

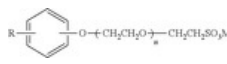


The application describes tubular **titanium oxide** particles represented by the following compositional formula (1): $\text{M} \text{b} \text{O} \text{x} \text{N} \text{y}$ wherein a and b are numbers satisfying the conditions of $a+b=1$ and $b=0 \sim 0.2$, x and y are numbers satisfying the conditions of $1\% \leq x < 2$, $1\% \leq y < 2$ and $0\% \leq y < 0.2$, and M is an element other than Ti, and containing **titanium oxide** as a main component. Photovoltaic cells and photocatalysts containing tubular **titanium oxide** particles are also disclosed.

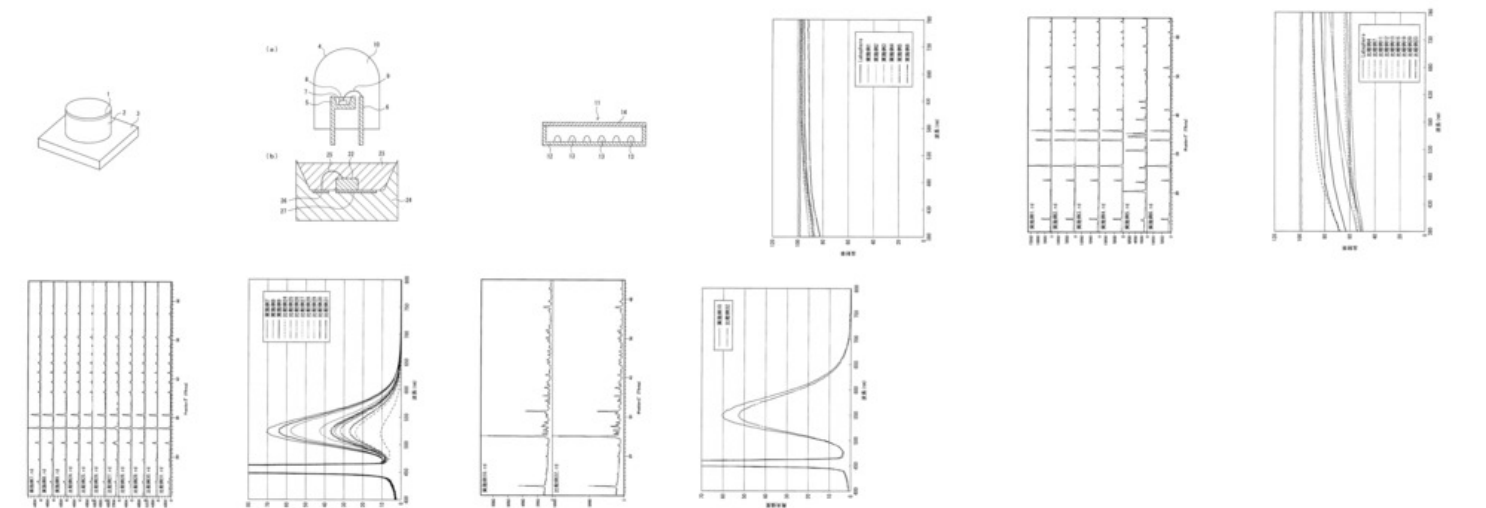


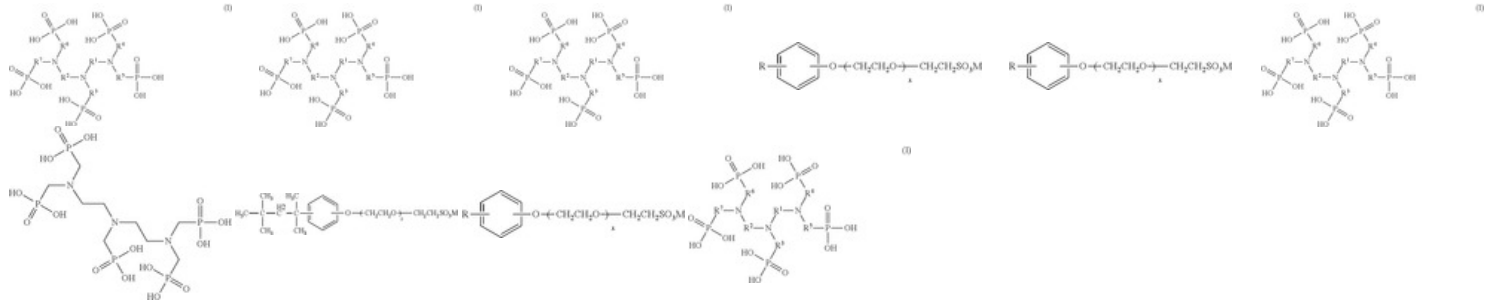
A method for chemical mechanical polishing of a **substrate** is provided, comprising: providing a **substrate**, wherein the **substrate** comprises polysilicon and at least one of **silicon oxide** and **silicon nitride**; providing a chemical mechanical polishing composition, comprising, as initial components: water; an abrasive; and an acyclic organosulfonic acid compound, wherein the acyclic organosulfonic acid compound has an acyclic hydrophobic portion having 6 to 30 carbon atoms and a nonionic acyclic hydrophilic portion having 10 to 300 carbon atoms; providing a chemical mechanical polishing pad with a polishing surface; moving the polishing surface relative to the **substrate**; dispensing the chemical mechanical polishing composition onto the polishing surface; and, abrading at least a portion of the **substrate** to polish the **substrate**; wherein at least some of the polysilicon is removed from the **substrate**; and, wherein at least some of the at least one of **silicon oxide** and **silicon nitride** is removed from the **substrate**.



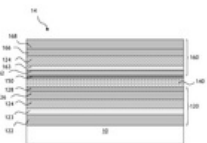
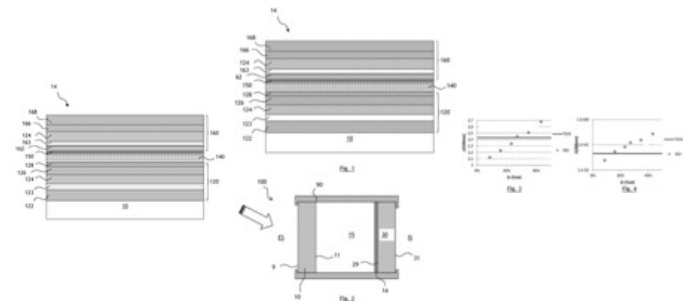
14.	Method of polishing a substrate comprising polysilicon and at least one of silicon oxide and silicon nitride	KR20110104444	2010-03-16	ROHM & HAAS ELECTRONIC MATERIALS* ROHM & HAAS ELECTRONIC MATERIALS CMP ROHM & HEASE ELECTRONIC MATERIALS C SE MICHUM HOLDINGS	2011-09-22	2011-09-22
A method for chemical mechanical polishing of a substrate is provided, comprising: providing a substrate, wherein the substrate comprises polysilicon and at least one of silicon oxide and silicon nitride; providing a chemical mechanical polishing composition, comprising, as initial components: water; an abrasive; and an alkyl aryl polyether sulfonate compound, wherein the alkyl aryl polyether sulfonate compound has a hydrophobic portion having an alkyl group bound to an aryl ring and a nonionic acyclic hydrophilic portion having 4 to 100 carbon atoms; providing a chemical mechanical polishing pad with a polishing surface; moving the polishing surface relative to the substrate; dispensing the chemical mechanical polishing composition onto the polishing surface; and, abrading at least a portion of the substrate to polish the substrate; wherein at least some of the polysilicon is removed from the substrate; and, wherein at least some of the at least one of silicon oxide and silicon nitride is removed from the substrate.						
15.	Crystalline silicon nitride , its production method, phosphor using the silicon nitride , phosphor-containing composition, light-emitting device, illuminating device, image display, sintered compact and pigment	JP2009263201	2008-07-31	MITSUBISHI CHEMICAL*	2009-11-12	2009-11-12

PROBLEM TO BE SOLVED: To provide: **silicon nitride** having high whiteness and reflectance; a method for producing the same; a phosphor having clear object color and high luminous brightness in comparison with a conventional one; a phosphor-containing composition; a light emitting device using the phosphor; an illuminating device; an image display; a ceramic having high whiteness; and a pigment.
SOLUTION: As a raw material of the phosphor, crystalline **silicon nitride**, having a crystal phase and exhibiting reflectance of ≥85% when it is irradiated with a light having a wavelength of 525 nm, is used.
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16.	Method of polishing a substrate comprising polysilicon, silicon oxide and silicon nitride	KR20110104443	2010-03-16	ROHM & HAAS ELECTRONIC MATERIALS* ROHM & HAAS ELECTRONIC MATERIALS CMP ROHM & HAASE ELECTRONIC MATERIALS C SE MICHUM HOLDINGS	2011-09-22	2011-09-22
A method for chemical mechanical polishing of a substrate is provided, comprising: providing a substrate, wherein the substrate comprises polysilicon, silicon oxide and silicon nitride; providing a chemical mechanical polishing composition, comprising, as initial components: water; an abrasive; an alkyl aryl polyether sulfonate compound, wherein the alkyl aryl polyether sulfonate compound has a hydrophobic portion having an alkyl group bound to an aryl ring and a nonionic acyclic hydrophilic portion having 4 to 100 carbon atoms; and a substance according to formula I wherein each of R1, R2, R3, R4, R5, R6 and R7 is a bridging group having a formula -(CH2)n-, wherein n is an integer selected from 1 to 10; providing a chemical mechanical polishing pad with a polishing surface; moving the polishing surface relative to the substrate; dispensing the chemical mechanical polishing composition onto the polishing surface; and, abrading at least a portion of the substrate to polish the substrate; wherein at least some of the polysilicon is removed from the substrate; and, wherein at least some of the silicon oxide and silicon nitride is removed from the substrate.						
						

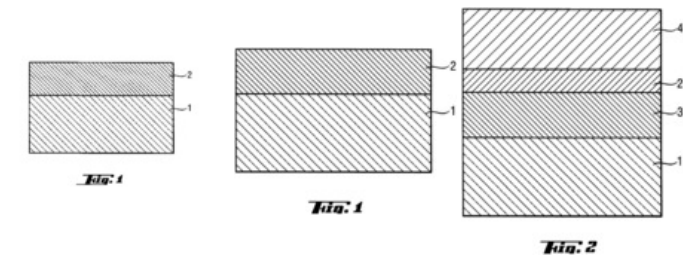
The invention relates to a transparent **substrate** (30) equipped, on a main face, with a stack of thin layers including a single functional metal layer (140) with reflective properties in the infrared and/or in the solar spectrum, in particular based on **silver** or a metal alloy containing **silver**, and two antireflection coatings (120, 160), said antireflection coatings each including at least one **dielectric** layer (122, 128; 162, 168), said functional layer (40) being placed between the two antireflection coatings (20, 60), characterised in that the antireflection coating (120) located between said **substrate** (30) and said functional layer (140), or even the two antireflection coatings (120, 160) includes/include a layer (126, 166) including **silicon-zirconium nitride**, SixZryNz , with an atomic ratio of Zr over the sum $\text{Si}+\text{Zr}$, $y/(x+y)$, that is comprised between 25.0% and 40.0% including these values, or even between 27.0% and 37.0% including these values.



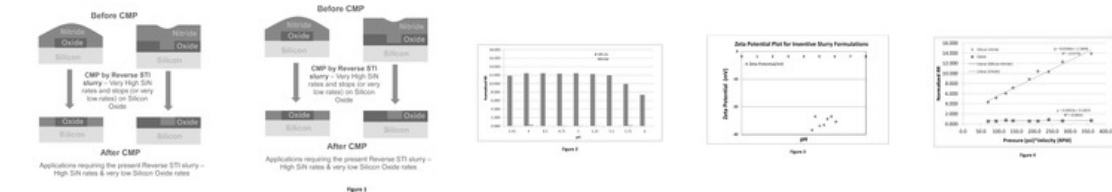
A transparent glass **substrate** (1) is coated with a **silicon nitride**-based or oxynitride-based thin film (2) which contains 30-60 (preferably 40-50) at.% Si, 10-56 (preferably 20-56) at.% N, 1-40 (preferably 5-30) at.% O and 1-40 (preferably 5-30) at.% C. Also claimed is a process for depositing the above thin film (2) by CVD from a **silicon** precursor (preferably a silane and/or silazane) and a nitrogen precursor, the nitrogen precursor being in the form of an amine, preferably a 1-6C alkyl prim., sec. or tert. amine, especially ethylamine, methylamine, dimethylamine, butylamine or propylamine.



Fig. 1



Stable aqueous polishing compositions that can selectively polish **silicon nitride** (SiN) films and nearly stop (or polish at very low rates) on **silicon oxide** films are provided herein. The compositions comprise an anionic abrasive, a **nitride** removal rate enhancer containing a carboxyl or carboxylate group, water, and optionally, an anionic polymer. The synergistic combination of anionic (negatively charged) abrasives and the **nitride** removal rate enhancer provide beneficial charge interactions with the **dielectric** films during CMP, a high SiN rate and selectivity enhancement (over **oxide**), and stable colloidal dispersed slurries.

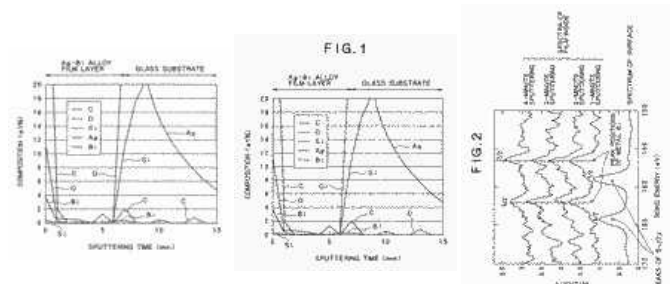
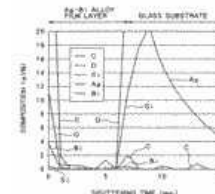


CMP process for substrates containing **silicon oxide dielectric** films and polysilicon and/or **silicon nitride** films comprising the steps of (1.) contacting the **substrate** with an aqueous composition containing (A) abrasive particles which are positively charged when dispersed in an aqueous medium having a pH in the range of from 3 to 9; (B) a water-soluble or water-dispersible linear or branched alkylene **oxide** homopolymer or copolymer; and (C) a water-soluble or water-dispersible polymer selected from (c1.) aliphatic and cycloaliphatic poly(N-vinylamide) homopolymers and copolymers, (c2) homopolymers and copolymers of acrylamide monomers of the general formulas I and II: $H_2C(-R)-C(=O)-N(-R_1)(-R_2)$ (I), $H_2C(-R)-C(=O)-R_3$ (II), wherein the variables have the following meaning R hydrogen atom, fluorine atom, chlorine atom, nitrile group, or organic residue; R1 and R2 hydrogen atom or organic residue; R3 saturated N-heterocyclic ring; (c3) cationic polymeric flocculants; and (c4) mixtures thereof; (2) polishing the **substrate** until the **silicon oxide dielectric** film is removed and the polysilicon and/or **silicon nitride** film is or are exposed exposed.

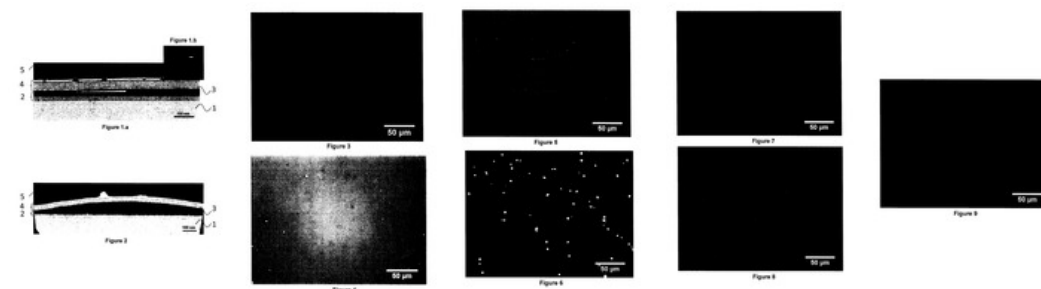
14.

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The present invention relates to an **Ag** alloy film. Particularly, it is preferably used as a reflective film or semi-transmissive reflective film for an optical information recording medium having high thermal conductivity/high reflectance/high durability in the field of optical information recording media, an electromagnetic-shielding film excellent in **Ag** aggregation resistance, and an optical reflective film on the back of a reflection type liquid crystal display device, or the like. The **Ag** alloy film of the present invention comprises an **Ag** base alloy containing Bi and/or Sb in a total amount of 0.005 to 10% (in terms of %). Further, the present invention relates to a sputtering target used for the deposition of such an **Ag** alloy film.

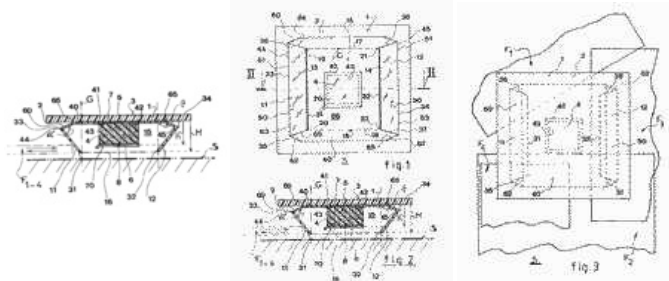
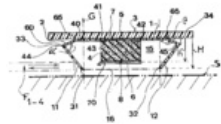


The invention concerns a glazing comprising a transparent **substrate** coated with a stack of thin layers comprising at least one functional metal layer made from **silver**, at least two antireflective coatings, each antireflective coating comprising at least one **dielectric** layer, such that each functional metal layer is disposed between two antireflective coatings. The stack comprises at least one antireflective coating comprising a **dielectric** layer likely to generate hole defects and at least one blocking layer made from **titanium oxide** having a thickness greater than 1 nm, the blocking layer is located between the antireflective coating comprising a **dielectric** layer likely to generate hole defects and a functional metal layer made from **silver**, in direct contact with the functional metal layer made from **silver**.



Process for producing a thin X-ray-amorphous layer of aluminium **nitride** or aluminium siliconitride on a surface by reactive cathodic sputtering or reactive magnetron-cathodic sputtering of aluminium or of aluminium and **silicon** in vacuo in a process gas atmosphere containing a rare gas and nitrogen, and by depositing the particular **nitride** layer from the gas phase, wherein... (a) as the rare gas, a mixture of argon and one or more of the rare gases neon, krypton or xenon is used,... (b) the volume ratio of argon to the other rare gases being 2:1 to 100:1 and... (c) the volume ratio of the rare gas mixture (a) to nitrogen being 2:1 to 10:1.

The invention concerns devices for maintaining sheets, cards or the like capable of being fixed on a shaped support (S). The inventive device is essentially characterised in that it comprises a relatively rigid front plate (1), a plate (4), means for fixing (7) the face (5) of the plate (4) on the front plate (1), at least two elastic flaps (11, 12) and means for mounting the two flaps in co-operation with the front plate (1) such that said flaps are capable of applying, via one first (31, 32) end, elastic forces at points located on two separate lines (13, 14) countering a reaction exerted by their second end (33, 34) on the first face (2) of the front plate (1) and the cylindrical volume (15) generated by a generatrix (G) substantially perpendicular to the face (2) of the front plate (1) and being supported on the convex polygon (16) formed by the two lines (13, 14) and the two straight lines (17, 18) joining respectively the two ends (19, 21-20, 22) of said two lines (13, 14), should have a cross-section not greater than the area of the face (2) of the front plate (1) and greater than the area of the face (6) of the plate (4), and such that the plate (4) is located in the cylindrical volume (15) substantially in its centre.



Disclosed is a **silicon nitride circuit substrate**, a manufacturing proceee thereof, and a semiconductor device therewith. The circuit **substrate** comprises: a **silicon nitride substrate**; a metal circuit plate; and an intermediate layer being interposed between the **silicon nitride** board and the metal circuit plate for joining the **silicon nitride substrate** and the metal circuit plate, and having a compound containing an aluminum **oxide** component. The concentration of the aluminum **oxide** component in the intermediate layer is higher in the side of the metal circuit plate than in the side of the **silicon nitride** board.

