

Search query (2): [SP]: 1. a material comprising a transparent substrate coated with a stack of thin layers successively comprising, starting from the substrate, an alternation of three silver-based functional metallic layers referred to, starting from the substrate, as first, second and third functional layers and of four dielectric coatings, referred to, starting from the substrate, as m1, m2, m3 and m4, each dielectric coating comprising at least one dielectric layer, so that each functional metallic layer is positioned between two dielectric coatings, wherein: a thickness of the first functional layer is less than a thickness of the second functional layer, the thickness of the first functional layer is less than a thickness of the third functional layer, the dielectric coatings m1 and m2 each have an optical thickness $eo1$ and $eo2$ satisfying the following equation: $eo2 \geq 1.1 \cdot eo1$. 2. the material as claimed in claim 1, wherein a ratio of the thickness of the third functional metallic layer to the thickness of the second functional layer is between 0.90 and 1.10, including these values. 3. the material as claimed in claim 1, wherein the three functional metallic layers satisfy the following characteristics: the thickness of the first functional metallic layer is between 6 and 12 nm, the thickness of the second functional metallic layer is between 13 and 20 nm, the thickness of the third functional metallic layer is between 13 and 20 nm. 4. the material as claimed in claim 1, wherein the stack also comprises at least one blocking layer located in contact with a functional layer, the at least one blocking layer being selected from metallic layers based on a metal or on a metal alloy, metal nitride layers, metal oxide layers and metal oxynitride layers of one or more elements selected from titanium, nickel, chromium and niobium. 5. the material as claimed in claim 4, wherein a total thickness of all the blocking layers in contact with the functional layers is between 0.1 and 2 nm, including these values. 6. the material as claimed in claim 1, wherein the dielectric coatings satisfy the following characteristics: the optical thickness of the first dielectric coating m1 is from 85 to 150 nm, the optical thickness of the second dielectric coating m2 is from 80 to 150 nm, the optical thickness of the third dielectric coating m3 is from 135 to 220 nm, the optical thickness of the fourth dielectric coating m4 is from 65 to 120 nm. 7. the material as claimed in claim 1, wherein each of the dielectric coatings comprises at least one dielectric layer having a barrier function based on silicon and/or aluminum compounds selected from oxides, silicon nitrides Si_3N_4 and AlN and oxynitrides $SiOxNy$ and $AlOxNy$. 8. the material as claimed in claim 1, wherein each dielectric coating comprises at least one dielectric layer having a stabilizing function based on a crystalline oxide. 9. the material as claimed in claim 1, wherein each functional layer is on top of a dielectric coating, an upper layer of which is a dielectric layer having a stabilizing function, and/or underneath a dielectric coating, a lower layer of which is a dielectric layer having a stabilizing function. 10. the material as claimed in claim 1, wherein the stack, defined starting from the transparent substrate, comprises: a first dielectric coating comprising at least one dielectric layer having a barrier function and one dielectric layer having a stabilizing function, optionally a blocking layer, a first functional layer, optionally a blocking layer, a second dielectric coating comprising at least one lower dielectric layer having a stabilizing function, one dielectric layer having a barrier function and one upper dielectric layer having a stabilizing function, optionally a blocking layer, a second functional layer, optionally a blocking layer, a third dielectric coating comprising at least one lower dielectric layer having a stabilizing function, one dielectric layer having a barrier function and one upper dielectric layer having a stabilizing function, optionally a blocking layer, a third functional layer, optionally a blocking layer, a fourth dielectric coating comprising at least one dielectric layer having a stabilizing function, one dielectric layer having a barrier function and optionally one protective layer. 11. the material as claimed in claim 1, wherein the material has a light transmission of less than 60.0 percent and/or a light reflection on the external side of greater than or equal to 20.0 percent. 12. a process for obtaining a material as claimed in claim 1, comprising depositing the layers of the stack by magnetron sputtering. 13. a glazing comprising at least one material as claimed in claim 1. 14. the glazing as claimed in claim 13, wherein the stack is positioned in the glazing so that the incident light coming from outside passes through the first dielectric coating before passing through the first functional metallic layer. 15. the glazing as claimed in claim 13, wherein the glazing is in the form of monolithic, laminated or multiple glazing. 16. the material as claimed in claim 4, wherein at least one blocking layer is Ti , TiN , $TiOx$, Nb , NbN , Ni , NiN , Cr , CrN , $NiCr$ or $NiCrN$ layer. 17. the material as claimed in claim 7, wherein the oxides are SiO_2 and Al_2O_3 . 18. the material as claimed in claim 8, wherein the crystalline oxide is zinc oxide, optionally doped with aluminum. 19. the material as claimed in claim 9, wherein the upper layer and lower layer are zinc oxide layers. 20. the glazing as claimed in claim 15, wherein the multiple glazing is a double glazing or triple glazing.

Results: 15

1) Family number: 57713052 (US2016124119A)

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Title: SUBSTRATE PROVIDED WITH A STACK HAVING THERMAL PROPERTIES

Abstract: A transparent substrate includes a stack of thin layers successively including, starting from the substrate, an alternation of three metallic functional layers, in particular of functional layers based on silver or on silver-comprising metal alloy, and of four antireflective coatings, each antireflective coating including at least one dielectric layer, so that each metallic functional layer is positioned between two antireflective coatings, wherein: the thicknesses of the metallic functional layers, starting from the substrate, increase as a function of the distance from the substrate, the second metallic functional layer is directly in contact with a blocking layer, referred to as second blocking layer, chosen from a blocking underlayer and a blocking overlayer, respectively referred to as second blocking underlayer and second blocking overlayer, the second blocking underlayer and/or the second blocking overlayer exhibits a thickness of greater than 1 nm.

Classifications:

International (IPC 8-9): C03C17/09 C03C17/22 C03C17/245

C03C17/36 C03C27/06 C03C27/12 G02B1/116

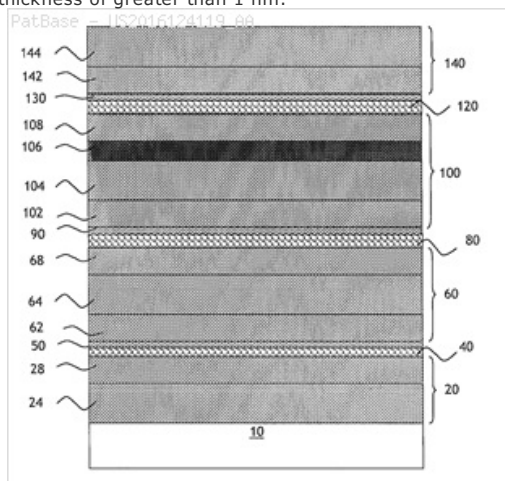
G02B5/28 (Advanced/Invention)

CPC: G02B1/116 G02B5/282 C03C17/36 C03C17/3613

C03C17/3618 C03C17/3626 C03C17/3639 C03C17/3644

C03C17/3652 C03C17/366 C03C17/3681

US: 359/585



Family:

Publication number	Publication date	Application number	Application date
BR112015026239 A2	20170725	BR20151126239	20140428
CN104619669 A	20150513	CN201480001322	20140428
CN104619669 B	20170322	CN201480001322	20140428
EP2991944 A1	20160309	EP20140726182	20140428
FR3005048 A1	20141031	FR20130053972	20130430
IN09890DN2015 A	20160318	IN2015DN09890	20151021
JP2016520031 T2	20160711	JP20160511114T	20140428
KR20160004280 A	20160112	KR20157030867	20140428
MX2015015046 A1	20160211	MX20150015046	20140428
RU2015150968 A	20170605	RU20150150968	20140428
RU2015150968 A3	20180402	RU20150150968	20140428

■ RU2656284 C2	20180604	RU20150150968	20140428
■ US2016124119 AA	20160505	US20140787920	20140428
■ US9846264 BB	20171219	US20140787920	20140428
■ WO14177798 A1	20141106	WO2014FR51013	20140428

Priority:

FR20130053972 20130430 RU20150150968 20140428 WO2014FR51013 20140428

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): SAINT GOBAIN ; SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN SA ; SEN GOBEN GLASS FRANS

Assignee(s): SAINT GOBAIN GLASS FRANCE SA

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Agent(s): BAGET ASTRID MARIE; SAINT GOBAIN RECHERCHE; AOKI ATSUSHI; KOGA TETSUJI; ISHIDA TAKASHI; OOO YURIDICHESKAYA GORODISSKIY I PARTNER Y FA; PILLSBURY WINTHROP SHAW PITTMAN LLP

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

2) Family number: 54364068 (US2015004383A)

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Title: SUBSTRATE PROVIDED WITH A MULTILAYER HAVING THERMAL PROPERTIES, WHICH INCLUDES FOUR METALLIC FUNCTIONAL LAYERS

Abstract: A substrate, or a transparent glass substrate, including a thin-film multilayer including an alternation of four functional metallic layers, or functional layers based on silver or on a metal alloy containing silver, and five antireflection coatings, each antireflection coating including at least one antireflection layer, so that each functional metallic layer is positioned between two antireflection coatings. The thickness of the second, third, and fourth functional metallic layers starting from the substrate is substantially identical, with a ratio of the thickness of one layer to the thickness of the preceding layer between 0.9 and 1.1 inclusive of these values, and the thickness of the first functional metallic layer is about half the thickness of the second functional metallic layer, with a ratio of the thickness of the second metallic layer to the thickness of the first functional metallic layer between 1.9 and 2.2 inclusive of these values.

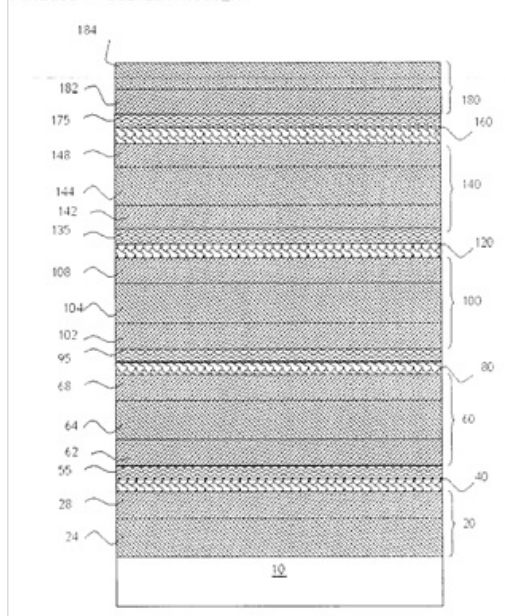
Classifications:

International (IPC 8-9): B32B17/06 B60J3/00 C03C17/36 C03C27/06 C03C27/12 E06B3/67 G02B1/11 H01L31/0216 H01L31/0224 H01L51/44 H01L51/52 (Advanced/Invention); C03C17/36 (Core/Invention)

CPC: C03C17/3618 C03C17/366 G02B1/116 E06B3/6715 B60J3/007 H01L31/022466 H01L31/02168 H01L51/442 H01L51/5203 C03C17/361 C03C17/3626 C03C17/3657 C03C17/3671 C03C17/3678 C03C17/3681 C03C17/3655 C03C2217/73 C03C17/3639 Y10T428/2495 C03C17/36

US: 428/213

PatBase - US2015004383_AA



Family:

Publication number	Publication date	Application number	Application date
■ BR112014014359 A2	20170613	BR20141114359	20130116
■ BR112014014359 A8	20170613	BR20141114359	20130116
■ BR112014014359 A8	20170627	BR20141114359	20130116
■ CA2858182 AA	20140604	CA20132858182	20130116
■ CN104039732 A	20140910	CN201380005544	20130116
■ CN104039732 B	20170426	CN201380005544	20130116
■ DE602013024317 D1	20170914	DE201360024317T	20130116
■ EA027007 B1	20170630	EA20140091381	20130116
■ EA201491381 A1	20141030	EA20140091381	20130116
■ EP2804843 A1	20141126	EP20130704165	20130116
■ EP2804843 B1	20170802	EP20130704165	20130116
■ ES2645615 T3	20171207	ES20130704165T	20130116
■ FR2985724 A1	20130719	FR20120050407	20120116
■ FR2985724 B1	20140307	FR20120050407	20120116
■ IN04796DN2014 A	20150220	IN2014DN04796	20140612
■ JP2015506331 T2	20150302	JP20140551668T	20130116
■ JP6231494 B2	20171115	JP20140551668T	20130116
■ KR20140124772 A	20141027	KR20147022483	20130116

MX2014008572 A1	20140822	MX20140008572	20130116
PT2804843 T	20171031	PT20130704165T	20130116
TH146372 A	20160229	TH20141004038	20130116
TR201715896 T4	20171221	TR20170015896T	20130116
US2015004383 AA	20150101	US20130372563	20130116
WO13107983 A1	20130725	WO2013FR50100	20130116

Priority:

FR20120050407 20120116 EP20130704165 20130116 WO2013FR50100 20130116

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): SAINT GOBAIN ; SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN SA

Assignee(s): SANDRE CHARDONNAL ETIENNE ; SAINT GOBAIN GLASS FRANCE18 AVENUE D'ALSACEF-92400COURBEVOIEFR

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Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

3) Family number: 50016099 (US2013057951A)

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Title: SOLAR CONTROL GLAZING WITH LOW SOLAR FACTOR

Abstract: The present invention relates to a substrate carrying a multilayer solar control stack, as well as to a multiple glazing incorporating at least one such sheet of glassy material carrying a solar control stack. The multilayer solar control stack comprises at least n functional layers based on a material which reflects infrared radiation and (n+1) transparent dielectric coatings such that each functional layer is surrounded by transparent dielectric coatings, n being greater than or equal to 3. The stack comprises at least one layer of metallic nature absorbing in the radiation which is visible inside the stack. The invention applies particularly to the formation of solar control glazings with low solar factor.

Classifications:

International (IPC 8-9): A47J B32B17/10 C03C17/36 C23C14/06

G02B5/08 G02B5/20 G02B5/22 G02B5/26

G02B5/28 (Advanced/Invention);

G02B5/20 (Core/Invention)

International (IPC 1-7): B32B17/10 C03C17/36 G02B5/08 G02B5/20 G02B5/22 G02B5/26

CPC: G02B5/208 C03C17/36 C03C17/3613 C03C17/3626

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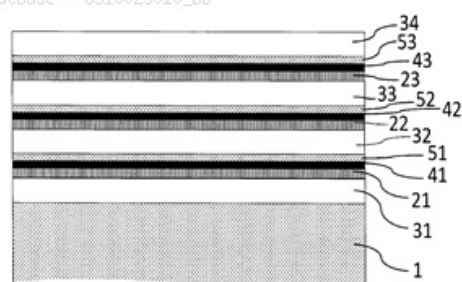
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US: 359/359

PatBase - US10025010_BB



Family:

Publication number	Publication date	Application number	Application date
AU2011257245 AA	20111201	AU20110257245	20110525
AU2011257245 BB	20150205	AU20110257245	20110525
BE1019345 AD	20120605	BE20100000310	20100525
BR112012030033 A2	20160802	BR20121130033	20110525
CA2800252 AA	20121120	CA20112800252	20110525
CN102918433 A	20130206	CN201180025796	20110525
CN102918433 B	20171027	CN201180025796	20110525
EA025674 B1	20170130	EA20120091341	20110525
EA201291341 A1	20130628	EA20120091341	20110525
EP2577368 A1	20130410	EP20110723911	20110525
IN10235DN2012 A	20160318	IN2012DN10235	20121123
JP2013532306 T2	20130815	JP20130511668T	20110525
JP5864555 B2	20160217	JP20130511668T	20110525
MX2012013662 A1	20130501	MX20120013662	20110525
SG185710 A1	20121228	SG20120086104	20110525
TH164229 A	20170706	TH20131003469	20110525
US2013057951 AA	20130307	US20110696911	20110525
US10025010 BB	20180717	US20110696911	20110525
WO11147864 A1	20111201	WO2011EP58540	20110525

Priority:

BE20100000310 20100525 WO2011EP58540 20110525

Probable Assignee: AGC GLASS EUROPE

Assignee(s): (std): AGC GLASS EUROPE ; HEVESI KADOSA ; SICHA JAN

Inventor(s): (std): HEVESI KADOSA ; SICHA JAN

Inventor(s): JAN SICHA ; KADOSA HEVESI

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Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT

4) Family number: 9333102 (US5595825A)

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Title: TRANSPARENT SUBSTRATE PROVIDED WITH A STACK OF THIN FILMS ACTING ON SOLAR AND/OR INFRARED RADIATION

Abstract: A transparent substrate (i), particularly glass, having a stack of thin films comprising successively from the substrate: i) a first dielectric material film; ii) a first film having infrared reflection properties; iii) a second dielectric material film; iv) a second film having infrared reflection properties; v) a third dielectric material film; vi) a third film having infrared reflection properties; and vii) a fourth dielectric material film, wherein the thickness of said third film having infrared reflection properties (vi) is greater than the thickness of said second film having infrared reflection properties (iv) and the thickness of said second film having infrared reflection properties (iv) is greater than the thickness of said first film having infrared reflection properties (ii).

Classifications:

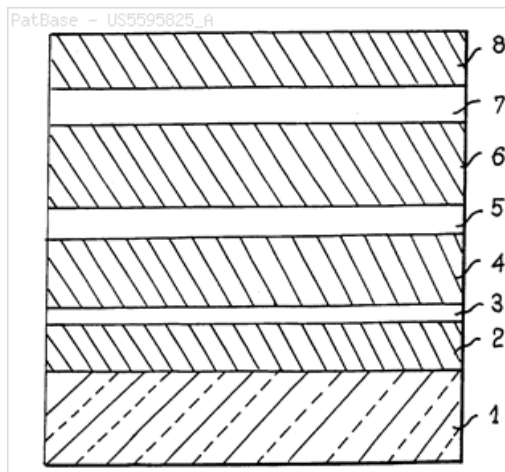
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International (IPC 1-7): B32B17/06 C03C17/34 C03C17/36 G02B1/10 G02B5/26

CPC: Y10S428/913 Y10T428/24975 C03C17/3613 C03C17/36 C03C17/3618 C03C17/3639 C03C17/3644 C03C17/3652 C03C17/366 C03C17/3681 C03C2217/78 G02B5/282

European: C03C17/36 C03C17/36B316 C03C17/36B320 C03C17/36B339 C03C17/36B342 C03C17/36B346 C03C17/36B352L C03C17/36B356 G02B5/28A1 M03C217/780

US: 359/360 359/585 359/589 428/216 428/428 428/432 428/433 428/434 428/469 428/472 428/699 428/701 428/702 428/913

**Family:**

Publication number	Publication date	Application number	Application date
AT167464 E	19980715	AT19940402051T	19940914
CA2132254 AA	19950324	CA19942132254	19940916
CA2132254 C	20031223	CA19942132254	19940916
DE69411107 D1	19980723	DE19946011107	19940914
DE69411107 T2	19990311	DE19946011107T	19940914
DK0645352 T3	19990406	DK19940402051T	19940914
EP0645352 A1	19950329	EP19940402051	19940914
EP0645352 B1	19980617	EP19940402051	19940914
ES2119110 T3	19981001	ES19940402051T	19940914
FR2710333 A1	19950331	FR19930011339	19930923
FR2710333 B1	19951110	FR19930011339	19930923
JP3902676 B2	20070411	JP19940229824	19940926
JP7149545 A2	19950613	JP19940229824	19940926
US5595825 A	19970121	US19940309652	19940921

Priority:

FR19930011339 19930923 CA19942132254 19940916

Probable Assignee: SAINT GOBAIN VITRAGE**Assignee(s):** (std): SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN VITRAGE ; SAINT GOBAIN VITRAGE INT**Assignee(s):** SAINT GOBAIN VITRAGE INTERNAL ; SAINT GOBAIN VITRAGE COURBEVOIE FR ; GUISELIN OLIVIER**Inventor(s):** (std): GUISELIN OLIVIER ; OLIVIER GUISELIN ; ORIBIE GISURIN**Inventor(s):** GUISELIN OLIVIER F 75017 PARIS FR**Agent(s):** GOUDREAU GAGE DUBUC**Designated states:** AT BE CH DE DK ES FR GB IT LI LU NL SE**5) Family number: 64636233 (US2018194676A)**

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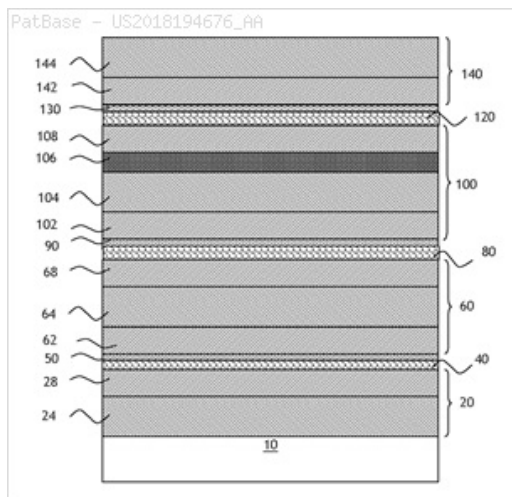
Title: SUBSTRATE PROVIDED WITH A STACK HAVING THERMAL PROPERTIES

Abstract: A material includes a transparent substrate coated with a stack of thin layers successively including, starting from the substrate, an alternation of three silver-based functional metallic layers and of four dielectric coatings, so that each functional metallic layer is positioned between two dielectric coatings. The thicknesses of the three functional layers and the thicknesses of the dielectric coatings are selected in order to give the materials solar factor values of less than 20 percent for a light transmission of the order of 40 percent.

Classifications:

International (IPC 8-9): C03C17/22 C03C17/23 C03C17/36 C23C14/00 C23C14/06 C23C14/08 C23C14/18 C23C14/34 C23C14/35 (Advanced/Invention)

CPC: C03C17/225 C03C17/23 C03C17/3642 C03C17/3668 C23C14/06 C23C14/35 C03C17/3613 C03C17/3681 C03C2218/156 C23C14/0652 C23C14/086 C23C14/185 C23C14/083 C23C14/3464 C23C14/0036 C03C17/3639 C03C17/36 C03C17/3644 C03C17/3652 C03C17/366



Family:

Publication number	Publication date	Application number	Application date
BR112017027153 A2	20180821	BR20171127153	20160630
CN107709263 A	20180216	CN201680039871	20160630
CO20170012948 A2	20180309	CO20170012948	20171215
EP3319919 A1	20180516	EP20160750913	20160630
FR3038596 A1	20170113	FR20150056476	20150708
ID201807153 A	20180720	ID2018P0000118	20160630
IN201817004182 A	20180420	IN201817004182	20180205
JP2018519238 T2	20180719	JP20180500298T	20160630
KR20180028436 A	20180316	KR20187000105	20160630
MX2017016710 A1	20180309	MX20170016710	20160630
US2018194676 AA	20180712	US20160742310	20160630
WO17006027 A1	20170112	WO2016FR51645	20160630

Priority:

FR20150056476 20150708 WO2016FR51645 20160630

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): SAINT GOBAIN ; SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN SA

Inventor(s): (std): JEAN CARLOS LORENZZI ; KAUFFMANN THIERRY ; LORENZZI JEAN CARLOS ; THIERRY KAUFFMANN

Agent(s): MARGARITA CASTELLANOS ABONDANO; SAINT GOBAIN RECHERCHE; IR MIGNI MYRIASANDRA NOERHADI SH MIP MSEL; AOKI ATSUSHI

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

6) Family number: 64636234 (US2018194675A)

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Title: MATERIAL PROVIDED WITH A STACK HAVING THERMAL PROPERTIES

Abstract: A material includes a transparent substrate coated with a stack of thin layers successively including, starting from the substrate, an alternation of three silver-based functional metal layers of increasing thickness and of four dielectric coatings denoted, starting from the substrate, M1, M2, M3 and M4, wherein each dielectric coating includes at least one high-index dielectric layer, the refractive index of which is at least 2.15 and the optical thickness of which is greater than 20 nm.

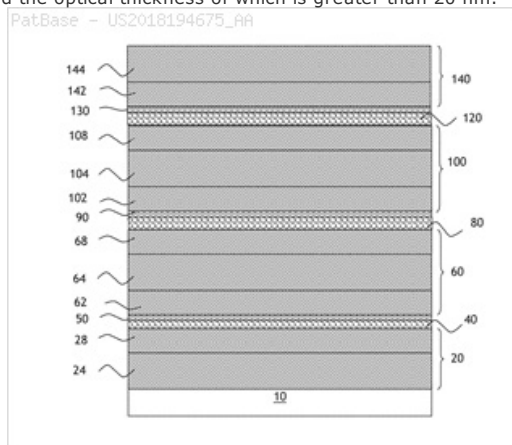
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International (IPC 8-9): B32B15/01 C03C17/22 C03C17/23

C03C17/36 C23C14/06 C23C14/35 (Advanced/Invention)

International (IPC 1-7): C03C17/36

CPC: C03C17/36 C03C17/3652 C03C17/225 C03C17/23 C03C17/3649 C03C17/3668 C23C14/06 C23C14/35 C03C2218/156 C03C17/3642 C03C17/3681 C03C17/3689 C03C2217/216 C03C2217/212 C03C2217/23 C03C2217/281 C03C2217/27 C03C2217/256 C03C17/3626 C03C17/366 C03C17/3639 C03C17/3644



Family:

Publication number	Publication date	Application number	Application date
BR112017027577 A2	20180828	BR20171127577	20160630
CN107709265 A	20180216	CN201680039944	20160630

CO20170013475 A2	20180410	CO20170013475	20171227
EP3319916 A1	20180516	EP20160742357	20160630
FR3038597 A1	20170113	FR20150056481	20150708
ID201807173 A	20180720	ID2018P0000123	20160630
IN201717045320 A	20180119	IN201717045320	20171218
JP2018520982 T2	20180802	JP20180500302T	20160630
KR20180026715 A	20180313	KR20187000101	20160630
MX2017016711 A1	20180309	MX20170016711	20160630
US2018194675 AA	20180712	US20160742337	20160630
WO17006029 A1	20170112	WO2016FR51651	20160630

Priority:

FR20150056481 20150708 WO2016FR51651 20160630

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): SAINT GOBAIN ; SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN SA

Inventor(s): (std): JEAN CARLOS LORENZZI ; LORENZZI JEAN CARLOS ; MERCADIER NICOLAS ; NICOLAS MERCADIER

Agent(s): MARGARITA CASTELLANOS ABONDANO; SAINT GOBAIN RECHERCHE; IR MIGNI MYRIASANDRA
NOERHADI SH MIP MSEL; AOKI ATSUSHI

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

7) Family number: 64636236 (US2018194677A)

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Title: SUBSTRATE PROVIDED WITH A STACK HAVING THERMAL PROPERTIES

Abstract: A material includes a transparent substrate coated with a stack of thin layers successively including, starting from the substrate, an alternation of three silver-based functional metallic layers and of four dielectric coatings, referred to, starting from the substrate, as M1, M2, M3 and M4, wherein the thickness of the first functional layer is less than the thickness of the second functional layer and less than the thickness of the third functional layer, the dielectric coatings M1 and M2 each have an optical thickness $Eo1$ and $Eo2$ satisfying the following equation: $Eo2 < 1.1Eo1$.

Classifications:

International (IPC 8-9): C03C17/22 C03C17/23 C03C17/36

C23C14/00 C23C14/06 C23C14/08 C23C14/18 C23C14/34

C23C14/35 (Advanced/Invention)

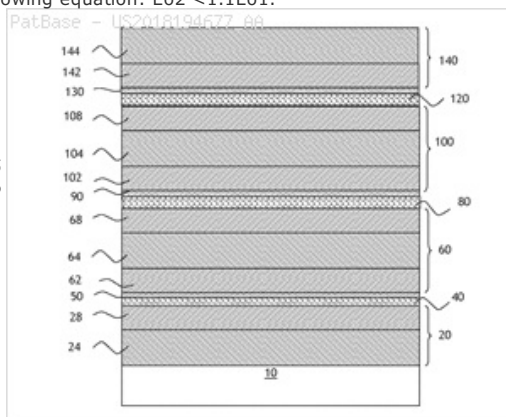
International (IPC 1-7): C03C17/36

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C23C14/3464 C23C14/0036 C23C14/0652 C23C14/086 C23C14/185

C23C14/083 C03C17/3639 C03C17/3644 C03C17/3652 C03C17/366



Family:

Publication number	Publication date	Application number	Application date
BR112017027581 A2	20180828	BR20171127581	20160630
CN107810170 A	20180316	CN201680039908	20160630
CO20170013531 A2	20180320	CO20170013531	20171227
EP3319917 A1	20180516	EP20160742359	20160630
FR3038598 A1	20170113	FR20150056483	20150708
FR3038598 B1	20170721	FR20150056483	20150708
ID201807138 A	20180720	ID2018P0000113	20160630
JP2018519239 T2	20180719	JP20180500304T	20160630
KR20180028435 A	20180316	KR20187000102	20160630
MX2017016712 A1	20180309	MX20170016712	20160630
US2018194677 AA	20180712	US20160742360	20160630
WO17006030 A1	20170112	WO2016FR51653	20160630

Priority:

FR20150056483 20150708 WO2016FR51653 20160630

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): SAINT GOBAIN ; SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN SA

Inventor(s): (std): LORENZZI JEAN CARLOS ; GEORGES BENOIT ; JEAN CARLOS LORENZZI ; BENOIT GEORGES ;
GEORGES BENO T

Agent(s): MARGARITA CASTELLANOS ABONDANO; SAINT GOBAIN RECHERCHE; IR MIGNI MYRIASANDRA
NOERHADI SH MIP MSEL; AOKI ATSUSHI

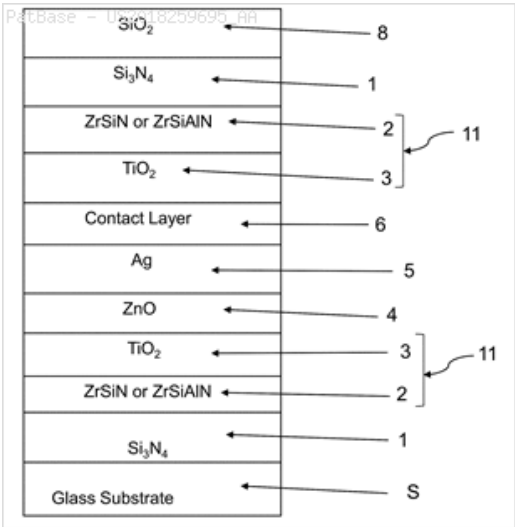
Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: COATED ARTICLE HAVING LOW-E COATING WITH IR REFLECTING LAYER(S) AND HIGH INDEX NITRIDED DIELECTRIC FILM HAVING MULTIPLE LAYERS

Abstract: A coated article includes a low emissivity (low-E) coating having at least one infrared (IR) reflecting layer of a material such as silver, gold, or the like, and at least one high refractive index dielectric multilayer film. The high index dielectric multilayer film may be of or include a first high index layer of or including ZrSiN and/or ZrSiAlN, and a second high index layer of or including titanium oxide (e.g., TiO₂). The first high index layer of or including ZrSiN and/or ZrSiAlN may be amorphous or substantially amorphous, and the second high index layer of or including titanium oxide may be substantially crystalline in certain example embodiments. The low-E coating may be used in applications such as monolithic or insulating glass (IG) window units, vehicle windows, or the like.

Classifications:

International (IPC 8-9): B32B15/04 B32B17/06 C03C17/36 G02B5/28 (Advanced/Invention)
CPC: G02B5/282 C03C17/3642 C03C17/3636 G02B5/285 C03C17/3626 C03C17/3607 C03C17/3615 C03C17/36 C03C17/3644 C03C17/366



Family:

Publication number	Publication date	Application number	Application date
US2018259695 AA	20180913	US20170453944	20170309
US10138159 BB	20181127	US20170453944	20170309
WO18165357 A1	20180913	WO2018US21441	20180308

Priority:

US20170453944 20170309

Probable Assignee: GUARDIAN IND

Assignee(s): (std): GUARDIAN GLASS LLC ; GUARDIAN IND

Assignee(s): GUARDIAN IND CORP ; INTERMOLECULAR INC

Inventor(s): (std): BOYCE BRENT ; DING GUOWEN ; LE MINH ; SCHWEIGERT DANIEL ; BOYCLE BRENT

Agent(s): NIXON AND VANDERHYE PC; RHOA JOSEPH A

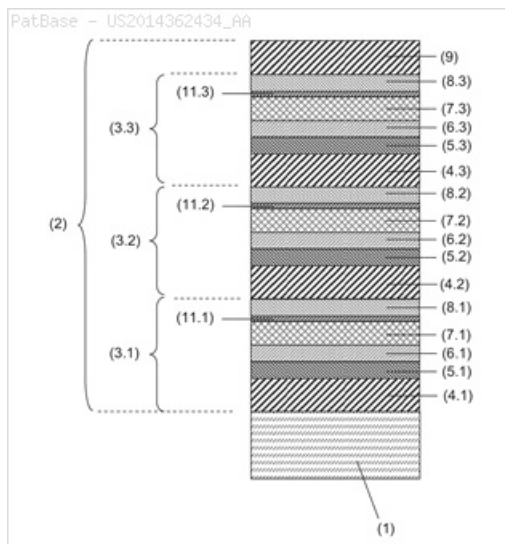
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Title: TRANSPARENT PANEL WITH ELECTRICALLY CONDUCTIVE COATING

Abstract: A transparent panel is described. The transparent panel has at least one transparent substrate and at least one electrically conductive coating on at least one surface of the transparent substrate. The electrically conductive coating has at least two functional layers which are arranged one above the other, and each functional layer has at least an optically highly refractive material layer, which has a refractive index greater than or equal to 2.1, and a smoothing layer, which is above the optically highly refractive material layer. The smoothing layer contains at least one non-crystalline oxide, a first matching layer, which is above the smoothing layer, an electrically conductive layer, which is above the first matching layer, and a second matching layer, which is above the electrically conductive layers. The total thickness of all the electrically conductive layers is between 40 nm and 75 nm, and the electrically conductive coating has a low ohm/square sheet resistance. The optically highly refractive material contains at least one mixed silicon/metal nitride.

Classifications:

International (IPC 8-9): B32B17/06 B32B17/10 B32B9/00 B60J1/20 C03C17/36 C03C27/12 E06B3/66 G02B1/10 G02B5/20 H05B3/84 H05B3/86 (Advanced/Invention)
CPC: E06B3/66 G02B5/208 G02B1/10 B32B17/10036 B32B17/10229 B32B17/10293 B32B17/10761 C03C17/3626 C03C17/3639 C03C17/3644 C03C17/3652 C03C17/366 H05B3/84 H05B2203/01 H05B2203/011 H05B2203/013 H05B2203/017 Y10T428/24942 Y10T428/24975 Y10T428/265 C03C17/36 H05B3/86
US: 1/1 359/350 427/125 428/212 428/216 428/336



Family:

Publication number	Publication date	Application number	Application date
BR112014012695 A2	20170613	BR20141112695	20121004
BR112014012695 A8	20170613	BR20141112695	20121004
BR112014012695 A8	20170620	BR20141112695	20121004
CN104081876 A	20141001	CN201280066685	20121004
CN104081876 B	20160831	CN201280066685	20121004
DE502012010252 D1	20170614	DE201250010252T	20121004
EA026887 B1	20170531	EA20140091353	20121004
EA201491353 A1	20150430	EA20140091353	20121004
EP2803246 A1	20141119	EP20120768818	20121004
EP2803246 B1	20170503	EP20120768818	20121004
ES2626057 T3	20170721	ES20120768818T	20121004
IN01087KN2014 A	20140627	IN2014KNO1087	20140521
JP2015509866 T2	20150402	JP20140551539T	20121004
JP5916894 B2	20160511	JP20140551539T	20121004
KR101574456 B1	20151211	KR20147018799	20121004
KR20140099547 A	20140812	KR20147018799	20121004
MX2014008319 A1	20140821	MX20140008319	20121004
PL2803246 T3	20170929	PL20120768818T	20121004
PT2803246 T	20170623	PT20120768818T	20121004
TR201710041 T4	20170821	TR20170010041T	20121004
US2014362434 AA	20141211	US20120358656	20121004
US9359807 BB	20160607	US20120358656	20121004
WO13104438 A1	20130718	WO2012EP69566	20121004

Priority:

EP20120150547 20120110 EP20120768818 20121004 WO2012EP69566 20121004

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): SAINT GOBAIN ; SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN SA

Inventor(s): (std): BILLET ULRICH ; CHRISTOPH SCHMITZ ; DAVID LUXEMBOURG ; KLAUS FISCHER ; MARCUS NEANDER ; SEBASTIAN JANZYK ; ULRICH BILLERT ; SCHMITZ CHRISTOPH ; NEANDER MARCUS ; LUXEMBOURG DAVID ; JANZYK SEBASTIAN ; FISCHER KLAUS ; BILLERT ULRICH

Agent(s): LENDVAI TOMAS DIPL CHEM DRERENAT; LENDVAI TOMAS; DE ELZABURU ALBERTO; CANAN OEZTUERKER; STEINFL AND BRUNO LLP

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

10) Family number: 71028577 (US2018251887A)

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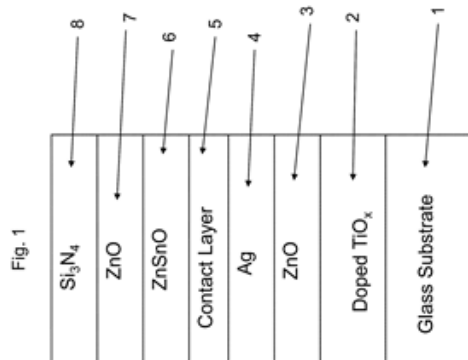
Title: COATED ARTICLE HAVING LOW-E COATING WITH IR REFLECTING LAYER(S) AND DOPED TITANIUM OXIDE DIELECTRIC LAYER(S) AND METHOD OF MAKING SAME

Abstract: A coated article includes a low emissivity (low-E) coating having at least one infrared (IR) reflecting layer of a material such as silver, gold, or the like, and at least one high refractive index layer of or including titanium oxide and at least one additional metal. A doped titanium oxide layer(s) is designed and deposited in a manner so as to be amorphous or substantially amorphous (as opposed to crystalline) in the low-E coating, so as to better withstand optional heat treatment (HT) such as thermal tempering and reduce haze. The high index layer may be a transparent dielectric high index layer in preferred embodiments, which may be provided for antireflection purposes and/or color adjustment purposes, in addition to having thermal stability.

Classifications:

International (IPC 8-9): B32B15/04 B32B17/06 C03C17/34 C03C17/36 C23C14/18 (Advanced/Invention)

CPC: C23C14/18 C03C17/34 C03C17/366 C23C14/185 C03C17/36 C03C17/3618 C03C17/3644 C03C17/3681

**Family:**

Publication number	Publication date	Application number	Application date
US2018251887 AA	20180906	US20170448739	20170303
US10196735 BB	20190205	US20170448739	20170303
WO18160933 A1	20180907	WO2018US20605	20180302

Priority:

US20170448739 20170303

Probable Assignee: GUARDIAN IND**Assignee(s):** (std): GUARDIAN GLASS LLC ; GUARDIAN IND**Assignee(s):** GUARDIAN IND CORP ; INTERMOLECULAR INC**Inventor(s):** (std): CLAVERO CESAR ; DING GUOWEN ; FRANK MARCUS ; JEWHRST SCOTT ; LE MINH ; LEE DANIEL ; MURPHY NESTOR ; MURPHY NESTOR P ; SARAF GAURAV ; SCHWEIGERT DANIEL ; ZHANG GUIZHEN**Agent(s):** NIXON AND VANDERHYTE PC ; RHOA JOSEPH A

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

11) Family number: 31770582 (US2006280951A)

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Title: TRANSPARENT SUBSTRATE COMPRISING A STACK OF THIN LAYERS FOR ELECTROMAGNETIC ARMOUR

Abstract: A transparent substrate, especially made of glass, provided with a thin-film multilayer (20) that includes three silver layers (Ag 1, Ag 2, Ag 3) and comprises, alternately on the substrate, a titanium dioxide layer (21), a metal oxide layer (22), one of the silver layers (Ag 1, Ag 2, Ag 3) and a covering layer (23), characterized in that: the metal oxide is zinc oxide; the covering layer (23) is a sacrificial metal; and an antireflection layer (24) comprising at least one metal oxide is deposited on the covering layer (23) for the silver layer (Ag₃) furthest away from the substrate.

Classifications:

International (IPC 8-9): B32B15/00 B32B15/04 B32B17/00 B32B17/06 B32B19/00 B32B9/00 C03C17/34 C03C17/36 C03C17/40 G02B1/10 G02B1/11 G02B5/26 G09F9/00 G09G3/28 H01J17/16 H01J5/02 H05K9/00 (Advanced/Invention);

C03C17/34 C03C17/36 G02B1/10 G02B1/11 (Advanced/Non-invention)

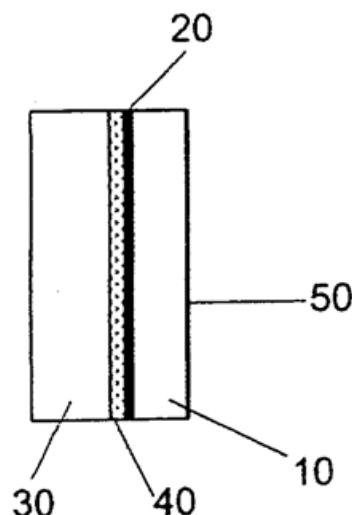
International (IPC 1-7): B32B17/00 B32B17/10 C03C17/36 C03C17/40 G09G3/28 H05K9/00

CPC: Y10T428/12646 H05K9/0096 B32B17/10018 B32B17/10174 B32B17/10761 B32B2367/00 C03C17/3618 C03C17/3639 C03C17/3644 C03C17/3652 C03C17/3676 C03C2217/73 H01J5/02 H01J17/16 H01J2211/446 C03C17/36

European: B32B17/10C2 B32B17/10E10 B32B17/10G28 C03C17/36 C03C17/36B320 C03C17/36B339 C03C17/36B342 C03C17/36B346 C03C17/36B354M H01J17/16 H01J5/02 H05K9/00B1B H05K9/00M H05K9/00M5B L32B367/00 M03C217/730 T01J211/44F

US: 359/360 359/360P 428/426 428/432 428/432P 428/433 428/434 428/469 428/469S 428/637 428/637S 428/701 428/701S 428/702 428/702S

PatBase - US2006280951_AA

**Family:**

Publication number	Publication date	Application number	Application date
AT441624 E	20090915	AT20040786318T	20040818
CN1852871 A	20061025	CN200480026704	20040818
CN1852871 B	20111005	CN200480026704	20040818
DE602004022955 D1	20091015	DE200460022955T	20040818
EP1663897 A1	20060607	EP20040786318	20040818

EP1663897 B1	20090902	EP20040786318	20040818
FR2859721 A1	20050318	FR20030010912	20030917
FR2859721 B1	20060825	FR20030010912	20030917
IN00335KN2006 A	20070316	IN2006KN00335	20060215
IN231747 B	20090313	IN2006KN00335	20060215
JP2007505810 T2	20070315	JP20060526656T	20040818
JP4800947 B2	20111026	JP20060526656T	20040818
KR101148039 B1	20120705	KR20067004999	20040818
KR20060073955 A	20060629	KR20067004999	20040818
MXPA06002831 A1	20060614	MX2006PA02831	20040818
US2006280951 AA	20061214	US20060572286	20060316
US2009015909 AA	20090115	US20080234881	20080922
US7452603 BB	20081118	US20060572286	20060316
WO05028391 A1	20050331	WO2004FR02152	20040818

Priority:

FR20030010912 20030917 FR20030031092 20030917 WO2004FR02152 20040818
US20060572286 20060316 US20080234881 20080922

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): BELLIOU SYLVAIN ; FLEURY CARINNE ; MAINPIN ESTELLE ; SAINT GOBAIN ; SAINT GOBAIN GLASSE FRANCE ; SAINT GOBAIN SA

Assignee(s): SAINT GOBAIN GLASS FRANCE

Inventor(s): (std): SYLVAIN BELLIOU ; ESTELLE MAINPIN ; CARINNE FLEURY ; ESTELLE FLEURY CARINNE BELLIOU ; MAINPIN ESTELLE ; FLEURY CARINNE ; BELLIOU SYLVAIN

Inventor(s): FLEURY CARINNE BELLIOU SYLVAIN MAINPIN ESTELLE

Agent(s): AUPETIT MURIEL J C ; C IRVIN MCCLELLAND OBLON SPIVAK MCCLELLAND MAIER AND NEUSTADT PC ; OBLON SPIVAK MCCLELLAND MAIER AND NEUSTADT PC

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

12) Family number: 68505687 (WO18024985A1)

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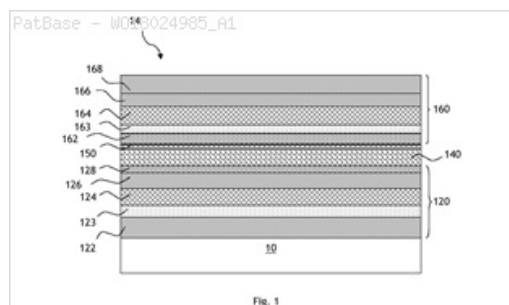
Title: SUBSTRATE EQUIPPED WITH A STACK WITH THERMAL PROPERTIES INCLUDING AT LEAST ONE LAYER COMPRISING ZIRCONIUM-RICH SILICON-ZIRCONIUM NITRIDE, USE AND MANUFACTURE THEREOF

Abstract: 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 Si+Zr , $y/(x+y)$, that is comprised between 25.0 percent and 40.0 percent including these values, or even between 27.0 percent and 37.0 percent including these values.

Classifications:

International (ipc 8-9): G02B1/10 G02B5/08 G02B5/26 G02B5/28 (Advanced/Invention)

CPC: G02B5/282 G02B5/0808 G02B5/26



Family:

Publication number	Publication date	Application number	Application date
CA3032330 AA	20190129	CA20173032330	20170802
FR3054892 A1	20180209	FR20160057497	20160802
WO18024985 A1	20180208	WO2017FR52166	20170802

Priority:

FR20160057497 20160802 WO2017FR52166 20170802

Probable Assignee: SAINT GOBAIN GLASS FRANCE

Assignee(s): (std): SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN

Assignee(s): BILLIERES DOMINIQUE ; CAILLET XAVIER ; MERCADIER NICOLAS ; ORVEN MATTHIEU

Inventor(s): (std): BILLIERES DOMINIQUE ; CAILLET XAVIER ; MERCADIER NICOLAS ; ORVEN MATTHIEU

Inventor(s): XAVIER CAILLET ; NICOLAS MERCADIER ; MATTHIEU ORVEN

Agent(s): LAVERY DE BILLY LLP ; SAINT GOBAIN RECHERCHE

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: TRANSPARENT PANE WITH ELECTRICALLY CONDUCTIVE COATING

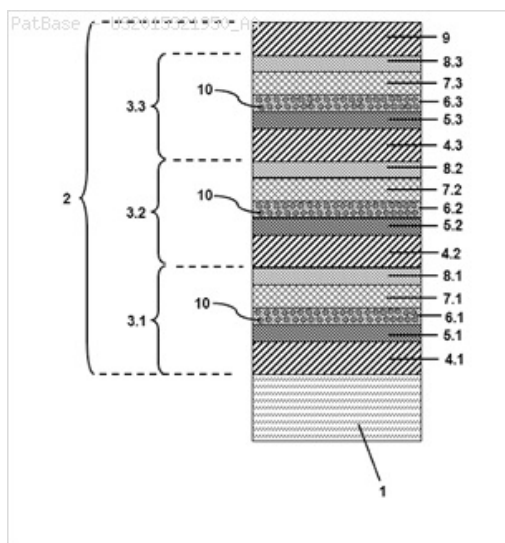
Abstract: A transparent pane having at least one transparent substrate and at least one an electrically conductive coating on at least one surface of the transparent substrate. The electrically conductive coating has at least two functional layers arranged one on top of another. Each functional layer contains: a layer of optically highly refractive material; a smoothing layer above the layer of optically highly refractive material; a lower adapting (matching) layer above the smoothing layer; an electrically conductive layer above the lower adapting layer; and an upper adapting (matching) layer above the electrically conductive layer. The lower adapting layer and/or the upper adapting layer contain a homogeneously distributed getter material. At least one lower adapting layer and/or upper adapting layer containing the getter material is in direct contact with the electrically conductive layer.

Classifications:

International (IPC 8-9): B32B17/10 B32B7/02 B60J1/00 C03C17/36 C03C27/12 C23C14/34 E06B3/00 E06B3/66 H05B3/86 H05K1/02 (Advanced/Invention); C03C17/36 (Core/Invention)

CPC: H05K1/0274 C03C17/3644 C03C17/3636 C03C17/3626 C23C14/34 C03C17/3618 C03C17/3673 E06B3/66 B32B17/10036 B32B17/10183 B32B17/10229 B32B17/10761 C03C17/36 C03C17/3639 C03C17/3652 H05B3/86 H05B2203/013

US: 174/258 204/192.29

**Family:**

Publication number	Publication date	Application number	Application date
BR112015011786 A2	20170711	BR20151111786	20131205
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US20150652105 20150612 US20170820300 20171121

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Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: MATERIAL COMPRISING A STACK WITH THERMAL PROPERTIES

Abstract: The present invention relates to a material comprising a transparent substrate on the surface of which a stack of layers is deposited which itself comprises a plurality of functional layers making it possible to act on the solar and/or infrared ray likely to strike said surface. The material comprises a transparent substrate on at least one surface of which a stack of

layers is deposited which comprises n silver-based metallic functional layers and n+1 dielectric assemblies of layers, n being equal to or greater than 3 and each silver-based metallic functional layer being arranged between two dielectric assemblies of layers. The material is characterized in that the dielectric assembly of layers located below the first silver-based metallic functional layer from the substrate and the dielectric assembly of layers located above the last silver-based metallic functional layer from the substrate, - each comprise a layer with a high refractive index, the value of said index being equal to or greater than 2.15 with a wavelength of 550 nm; -the value of the refractive index of at least one of the high index layers is equal to or greater than 2.40 with a wavelength of 550 nm; and - the value of the ratio of the optical thickness of each of said high refractive index layers to the optical thickness of the dielectric assembly of layers in which it is included is between 0.25 and 0.55. The invention also relates to glazing including such a material.

Classifications:

International (IPC 8-9): C03C17/36 (Advanced/Invention)

CPC: C03C17/3639 C03C17/36 C03C17/3644 C03C17/366

Family:

Publication number	Publication date	Application number	Application date
FR3069241 A1	20190125	FR20170056949	20170721
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Inventor(s): NISITA WANAKULE ; JULIEN BEUTIER

Agent(s): SAINT GOBAIN RECHERCHE

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15) Family number: 51446922 (US2014198389A)

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Title: SUBSTRATE PROVIDED WITH A MULTILAYER COATING HAVING THERMAL PROPERTIES, IN PARTICULAR FOR PRODUCTION OF A HEATED GLAZING UNIT

Abstract: The invention relates to a substrate (10), especially a transparent glass substrate, equipped with a thin-film multilayer comprising, in alternation, "n" metallic functional films (40, 80, 120), in particular functional films based on silver or a metal alloy containing silver, and "(n+1)" antireflection coatings (20, 60, 100, 140), where n is an integer?3, each antireflection coating comprising at least one antireflection film, so that each functional film (40, 80, 120) is located between two antireflection coatings (20, 60, 100, 140), characterized in that said multilayer comprises at least two high-refractive-index antireflection films (25, 145), each having a refractive index?2.15 such that the antireflection coating (20) located under the first, starting from the substrate, functional film (40) and the antireflection coating located on the last, starting from the substrate, functional film each comprise at least one high-refractive-index antireflection film (25, 145) and each antireflection coating (60, 100) located between two functional films does not comprise a high-refractive-index film.

Classifications:

International (IPC 8-9): B32B17/10 C03C17/34 C03C17/36

G02B1/11 G02B1/116 G02B5/20 G02B5/26

G02F1/15 (Advanced/Invention)

CPC: G02B1/11 C03C17/366 C03C17/3681 C03C2217/73

C03C2217/734 C03C17/3618 C03C17/3626 C03C17/3639

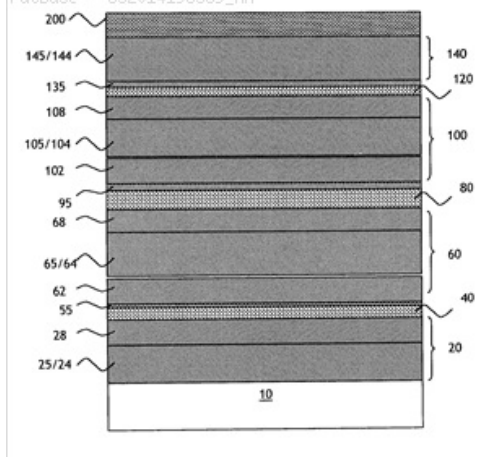
C03C17/3644 C03C17/3652 C03C17/36

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US: 359/585

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FR20110050087 20110106 EP20120702304 20120106 WO2012FR50041 20120106

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