

Search history

Search INV=(GOEBEL, Sandy) and AP=(co20160105035) (Results 1)

1:

Search fn=(58870682) (Results 1)

2:

Search [SP]: related applications [0001] this application claims priority to u.s. provisional application ser. no. 61/882,495 filed sep. 25, 2013

3: entitled ophthalmic lens holder for physical vapor deposition, which is hereby incorporated by reference in its entirety. field of the invention [0002] the present invention relates to the coating of optical lenses and, more particularly, to systems and methods for holding optical lenses during a lens coating process. background of the invention [0003] anti-reflective coatings reduce reflections off the front and back surfaces of ophthalmic lenses and therefore are desirable for creating eyeglasses with improved light transmission, visibility, and aesthetics. typically, these anti-reflective coatings must be applied as one or more layers having a precise and relatively thin thickness. in this respect, physical vapor deposition machines, such as sputtering box coaters, are often used for the coating application process.[0004] fig. 1 is a plan view of a horizontally rotating drum 10 for holding a lens 22 for coating a surface 22a of the lens 22 in a vertical orientation within an interior of a sputtering box or chamber. the drum 10 includes a plurality of sides 6 that are separated from each other by divider walls 4. as shown in fig. 2, each side 6 has a mounting fixture 8 onto which an item, for example the optical lens 22, can be mounted for coating. [0005] in operation, an ophthalmic lens 22 is mounted to the fixture 8 via a double-sided adhesive pad or tape 20. one drawback to this mounting style is that a backside 22b of the lens 22 must be completely covered with an adhesive tape 20 or similar covering to prevent portions of the backside 22b of the lens 22 from also being coated. since this back covering must precisely and completely cover the backside 22b surface of the lens 22, the tape 20 can be time consuming to apply. additionally, the adhesive nature of the double-sided adhesive pad 20 often prevents the tape 20 from being reused for the coating more than one lenses 22.[0006] what is needed in the art is a drum and lens holder system that is more robust, reusable, and allows for a more efficient holding and exchange of lenses of varying shapes and sizes. objects and summary of the invention [0007] lens holding systems and methods according to the present invention provide robust, reusable, and efficient holding and exchange systems for lenses of varying shapes and sizes during a coating process such as vapor deposition. these objectives are realized, in part, by providing a housing or drum having a plurality of apertures into which lens holders can be inserted and secured.[0008] the lens holders are configured to accept a single lens size and shape or, alternatively, configured to employ a system of spring arms that facilitate acceptance of a variety of lenses of different sizes and shapes.[0009] the housing or drum may be of a modular design that is formed of a plurality of individual drum segments that are held together by, for example, magnets. the housing and/or lens holder may be configured to present the lens for uniform coating across a surface of the lens or for a non-uniform, for example gradient, coating across a surface of the lens. brief description of the drawings [0010] these and other aspects, features and advantages of which embodiments of the invention are capable of will be apparent and elucidated from the following description of embodiments of the present invention, reference being made to the accompanying drawings, in which[0011] fig. 1 is a plan view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0012] fig. 2 is an elevation view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0013] fig. 3 a plan view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0014] fig. 4 is an elevation view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0015] fig. 5 is a plan view of a lens holder fixture according to one embodiment of the present invention[0016] fig. 6 is a plan view of a lens holder fixture according to one embodiment of the present invention[0017] fig. 7 is a plan view of a lens holder fixture according to one embodiment of the present invention[0018] fig. 8 is a plan view of a lens holder fixture according to one embodiment of the present invention[0019] fig. 9 is an elevation view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0020] fig. 10 is an elevation view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0021] fig. 11 is a perspective view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0022] fig. 12 is a plan view of a lens holder assembly according to one embodiment of the present invention and,[0024] fig. 14 is a plan view of a lens holder assembly according to one embodiment of the present invention. description of embodiments [0025] specific embodiments of the invention will now be described with reference to the accompanying drawings. this invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. the terminology used in the detailed description of the embodiments illustrated in the accompanying drawings is not intended to be limiting of the invention. in the drawings, like numbers refer to like elements.[0026] with reference to figs. 3 and 4, one embodiment of the present invention employs a housing or drum 100 having a plurality of divider walls 102 that extend from the intersections of a plurality of drum sides 106. for example, the drum 100 may employ six sides 106, as shown in fig. 4, or as few as 2 drum sides 106. the lens retaining system includes a spring clip ring 104 within which the lens 22 is retained or secured. the spring clip ring 104 is, in turn, secured to the drum 100 by guides 108 that are formed vertically within the divider walls 102. the sides of the spring clip ring 104 slides within opposing guides 108. in one embodiment, the guides 108 are, for example grooves, channels, or parallel raised lips formed within or on the surface of opposing sides of each divider wall 102. each guide 108 begins, for example at an upper most end of the walls 102 and extend downward.[0027] in one embodiment, the spring clip ring 104 includes a rigid framework formed of an outer portion 110 and a lens support portion comprising a plurality of spring-loaded arms 112 that are biased inward relative to the outer portion 110. in this respect, the plurality of arms 112 apply opposing pressure against the edge or edges of the lens 22, thereby securing the lens 22 in a removable arrangement.[0028] in one embodiment, the spring clip ring 104 is composed of a wire and has an internal diameter of about 82 millimeters and an external diameter of about 85 millimeters. the walls 102 have a height of, for example, about 85 millimeters and are spaced, for example, about 90 millimeters from each other. the guides 102 have a height of, for example, about 65 millimeters, a width of about 7 millimeters and a depth of about 7 millimeters.[0029] the spring clip ring 104 is sized such that its diameter is larger than the distance between the inner surfaces of two adjacent divider walls 102, but smaller or nearly the same size as the distance between the interior surface of the opposing guides 108. hence, the spring clip ring 104 can be simultaneously slid into each guide 108, starting at the upper, open ends of the guides 108 and rests upon the lower, closed end of the guide 108.[0030] in one embodiment, each guide 108 is preferably located between the top of each divider wall 102 and a position about halfway down the vertical height of the wall 102. in another embodiment, the guide 108 is located between the top of each divider wall 102 and any lower point that would maintain the spring clip ring 104 between the top and bottom of the divider walls 102. in yet another embodiment, the guide 108 extends the entire length of the divider wall 102, allowing the spring clip ring 104 to rest on a lower horizontal surface of the drum 100.[0031] with reference to figs. 5-9, in another embodiment of the present invention, instead of employing spring clip ring 104 to attach the lens 22 to the drum 100, a curved fixture 120 is employed to secure the lens 22 to the drum 100. the fixture 120 is formed of an elongated rigid member having a generally ring, crescent, "c-shape," or broken or incomplete-circle shape. the gap between ends of the fixture 120 is, for example, between 180 degrees and 0 degree (Results 6)

Search [SP]: [0010] these and other aspects, features and advantages of which embodiments of the invention are capable of will be apparent and elucidated from the following description of embodiments of the present invention, reference being made to the accompanying drawings, in which[0011] fig. 1 is a plan view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0012] fig. 2 is an elevation view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0013] fig. 3 a plan view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0014] fig. 4 is an elevation view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0015] fig. 5 is a plan view of a lens holder fixture according to one embodiment of the present invention[0016] fig. 6 is a plan view of a lens holder fixture according to one embodiment of the present invention[0017] fig. 7 is a plan view of a lens holder fixture according to one embodiment of the present invention[0018] fig. 8 is a plan view of a lens holder fixture according to one embodiment of the present invention[0019] fig. 9 is an elevation view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0020] fig. 10 is an elevation view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0021] fig. 11 is a perspective view of a drum for a vapor deposition coater system according to one embodiment of the present invention[0022] fig. 12 is a plan view of a lens holder assembly according to one embodiment of the present invention[0023] fig. 13 is a cross-sectional view of a lens holder assembly according to one embodiment of the present invention and,[0024] fig. 14 is a plan view of a lens holder assembly according to one embodiment of the present invention. (Results 11)

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Title: Synchronous shielding in vacuum deposition system

Abstract: Source: US4022939A A sputtering apparatus of the bell-jar type includes a high-vacuum pump disposed centrally of, and directly within a vacuum chamber of the apparatus. A separate enclosing member is disposed within the chamber and allows selective exposure of the pump to the chamber. An annular workholder is mounted in concentric surrounding relation with the pump, and an apertured, annular shutter is mounted in concentric surrounding relation with the workholder. Targets of materials to be sputter deposited on the workpieces are mounted on the inside wall of the main enclosure of the apparatus. The shutter and the workholder are moved in synchronism at the beginning and at the end of the deposition cycle to provide a uniform exposure of all the workpieces to the targets.

Classifications:

International (IPC 8-9): B01J3/02 C23C14/24 C23C14/34

C23C14/50 C23C14/56 F04B37/16 (Advanced/Invention);

B01J3/02 C23C14/24 C23C14/34 C23C14/50 C23C14/56

F04B37/00 (Core/Invention)

International (IPC 1-7): B01J3/00 B01J3/03 B01J3/04 B05B13/00

B05C C23B C23C13/02 C23C13/08 C23C14/34 C23C15/00

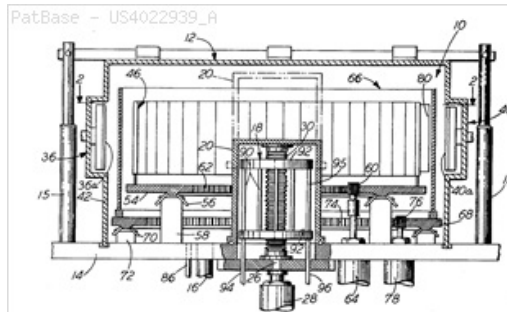
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CPC: C23C14/505 C23C14/564 C23C14/568

European: C23C14/50B C23C14/56D C23C14/56F

US: 118/49.1 118/504 118/720 118/730 118/733 204/298

204/298.07 204/298.11 204/298.15 204/298.26 427/251 427/282



Family:

Publication number	Publication date	Application number	Application date
BE849387 A1	19770401	BE19760173243	19761214
CA1118714 A1	19820223	CA19760265248	19761109
DE2656723 A1	19770707	DE19762656723	19761215
DE2656723 B2	19790719	DE19762656723	19761215
DE2656723 C3	19800306	DE19762656723	19761215
ES454329 A1	19780101	ES19760454329	19761217
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JP55038427 B4	19801003	JP19760151032	19761217
NL168566 B	19811116	NL19760013969	19761216
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SE417281 B	19810309	SE19760013681	19761206
SE417281 C	19810625	SE19760013681	19761206
SE7613681 A	19770619	SE19760013681D	19761206
US4022939 A	19770510	US19750642043	19751218
US4051010 A	19770927	US19770758300	19770110
US4062319 A	19771213	US19770758385	19770110

Priority:

CA19760265248 19761109 US19750642043 19751218 US19770758300 19770110

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Agent(s): KIRBY EADES GALE BAKER

Legal status (INPADOC)

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Patent	Date recorded	Event group	Code	Event	Details
BE849387 A1	19770401	LSPB	+	published / reissued	
BE849387 A1	19850630	LSLE	-RE	LAPSED	OWNER NAME : WESTERN ELECTRIC CY INC. EFFECTIVE DATE : 19841214
CA1118714 A1	19820223	LSPB	+	published / reissued	
CA1118714 A1	19990223	LSLE	-MKEX	EXPIRY	
DE2656723 A1	19770707	LSPB	+	published / reissued	
DE2656723 A1	19780209	LSSES	+OD	REQUEST FOR EXAMINATION	

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DE2656723 A1	19851205	LSLE	-8339	CEASED/NON-PAYMENT OF THE ANNUAL FEE	
DE2656723 B2	19790719	LSPB	+	published / reissued	
DE2656723 C3	19800306	LSGT	+	granted / extensions (spc, cpc, pte)	
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Title: Magnetron sputtering apparatus and process

Abstract: Source: US4851095A A rotary cylindrical sputtering system incorporates separate, separately-controlled linear magnetron sputter cathode and reaction zones for sputter depositing materials such as refractory metals and forming oxides and other compounds and alloys of such materials. The associated process involves rotating or translating workpieces past the differentially pumped, atmospherically separated, sequentially or simultaneously operated cathode and reaction zones and is characterized by the ability to form a wide range of materials, by high throughput, and by controlled coating thickness, including both constant and selectively varied thickness profiles.

Classifications:

International (IPC 8-9): B05C21/00 B05C9/06 B05D1/00 B05D3/10 B05D5/06 C23C14/00 C23C14/08 C23C14/10 C23C14/14 C23C14/24 C23C14/34 C23C14/35 C23C14/50 C23C14/54 C23C14/56 C23C14/58 C23C8/02 F16H1/36 G02B1/10 H01J37/34 (Advanced/Invention); C23C14/00 C23C14/08 C23C14/10 C23C14/24 C23C14/34 C23C14/35 C23C14/50 C23C14/54 C23C14/56 C23C14/58 C23C8/02 F16H1/28 G02B1/10 (Core/Invention)

International (IPC 1-7): B05C21/00 B05C9/06 B05D1/00 B05D3/10 B05D5/6 C23C14/14 C23C14/22 C23C14/24 C23C14/32 C23C14/34 C23C14/35 C23C14/50 C23C14/54 C23C14/56 C23C14/58 F16H1/28 G02B1/10 H01J37/34

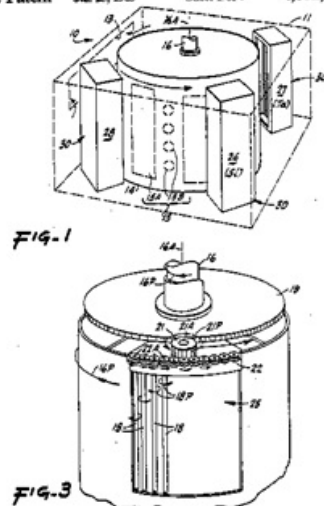
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European: C23C14/00F2D C23C14/00F2L2 C23C14/08 C23C14/08H C23C14/10 C23C14/34B C23C14/35D C23C14/50B C23C14/56 C23C14/56B C23C14/56F C23C14/58 C23C14/58B C23C8/02 F16H1/36 M23C14/00F2 M23C14/08 M23C14/58B T01J237/022

US: 118/719 118/723R 118/730 204/192.12 204/192.13 204/192.15 204/192.26 204/192.27 204/192.28 204/192.29 204/298.19 204/298.24 204/298.26 204/298.27 204/298.28 204/298.29 427/255.5 427/538 427/539 427/551

PatBase - US4851095_A

U.S. Patent Jul. 25, 1989 Sheet 1 of 7 4,851,095



Family:

Publication number	Publication date	Application number	Application date
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AT151119 E	19970415	AT19890300521T	19890119
AT183245 E	19990815	AT19890101758T	19890119
AT189272 E	20000215	AT19900117528T	19901112
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DE68927920 D1	19970507	DE19896027920	19890119
DE68927920 T2	19970717	DE19896027920T	19890119
DE68927920 T3	20041216	DE19896027920T	19890119
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EP0328257 B1	19970402	EP19890300521	19890119
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Priority:

CA19890590272 19890207	CA19902021367 19900717	EP19890300521 19890119
CA19922059094 19920109	CA19922059094 19920109	CA19902029755 19901113
US19900490535 19900305	EP19900312323 19901112	US19900604356 19901026
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US19930088401 19930706	US19910785230 19911024	

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Assignee(s): (std): OPTICAL COATING LABORATORY INC

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Designated states: AT BE CH DE DK ES FR GB GR IT LI LU MC NL PT SE

Legal status (INPADOC)

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Patent	Date recorded	Event group	Code	Event	Details
AT138111 E	19960615	LSGT	+	granted / extensions (spc, cpc, pte)	
AT138111 E	19961115	LSLE	-RER	CEASED AS TO PARAGRAPH 5 LIT. 3 LAW INTRODUCING PATENT TREATIES	
AT151119 E	19970415	LSGT	+	granted / extensions (spc, cpc, pte)	
AT151119 E	19971015	LSLE	-RER	CEASED AS TO PARAGRAPH 5 LIT. 3 LAW INTRODUCING PATENT TREATIES	
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AT189272 E	20000215	LSGT	+	granted / extensions (spc, cpc, pte)	
AT189272 E	20000715	LSLE	-RER	CEASED AS TO PARAGRAPH 5 LIT. 3 LAW	

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CA1340651 A1	20160914	LSLE	-MKEX	EXPIRY EFFECTIVE DATE : 20160713
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CA2021367 AA	19970717	LSLE	-FZDE	DEAD
CA2029755 AA	19910514	LSPB	+	published / reissued
CA2029755 AA	19921005	LSES	+EEER	EXAMINATION REQUEST
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DE68927920 T3	20041216	LSGT	+	granted / extensions (spc, cpc, pte)
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EP0328257 A2	19920902	LSES	+17Q	FIRST EXAMINATION EFFECTIVE DATE : 19920717

REPORT					
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EP0328257 A2	19980311	LSOP	-26	OPPOSITION FILED	PARTY TYPE : OPPONENT OPPONENT : APPLIED VISION LTD EFFECTIVE DATE : 19970919
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EP0494790 A2	19951206	LSDW	-18D	DEEMED TO BE WITHDRAWN	EFFECTIVE DATE : 19950506
EP0655515 A1	19950531	LSPB	+	published / reissued	
EP0655515 A1	19950531	LSES	+17P	REQUEST FOR EXAMINATION FILED	EFFECTIVE DATE : 19950209
EP0655515 A1	19981028	LSES	+17Q	FIRST EXAMINATION REPORT	EFFECTIVE DATE : 19980910
EP0655515 A1	19990811	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : AT NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 19990811
EP0655515 A1	19990811	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : BE NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 19990811
EP0655515 A1	19990811	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : CH NOTIFICATIONNOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 19990811
EP0655515 A1	19990811	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT	COUNTRY OF REF DOCUMENT : ES NOTIFICATIONNOFLAPSE : THE PATENT HAS BEEN ANNULLED BY A DECISION OF A NATIONAL AUTHORITY

				INFORM. FROM NAT. OFFICE TO EPO	LAPSED DATE : 19990811
EP0655515 A1	19990811	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : GR NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 19990811
EP0655515 A1	19990811	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : LI NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME- LIMIT LAPSED DATE : 19990811
EP0655515 A1	19990811	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : NL NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME- LIMIT LAPSED DATE : 19990811
EP0655515 A1	19990811	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : SE NOTIFICATIONOFLAPSE : THE PATENT HAS BEEN ANNULLED BY A DECISION OF A NATIONAL AUTHORITY LAPSED DATE : 19990811
EP0655515 A1	19990813	LSNP	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : EP
EP0655515 A1	20000103	LSLE	-NLV1	NL: LAPSED OR ANNULLED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT	REF COUNTRY CODE : EP
EP0655515 A1	20000119	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : LU NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20000119
EP0655515 A1	20000215	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : PL
EP0655515 A1	20000705	LSOP	-26	OPPOSITION FILED	PARTYTYPE : OPPONENT OPPONENT : DEPOSITION SCIENCES, INC. EFFECTIVE DATE : 20000511
EP0655515 A1	20000705	LSOP	-26	OPPOSITION FILED	PARTYTYPE : OPPONENT OPPONENT : APPLIED VISION LTD THE COURTYARD WHITWICK BUSINESS EFFECTIVE DATE : 20000511
EP0655515 A1	20031015	LSOP	-R26	OPPOSITION FILED (CORRECTION)	PARTYTYPE : OPPONENT OPPONENT : DEPOSITION SCIENCES, INC. EFFECTIVE DATE : 20000511
EP0655515 A1	20031015	LSOP	-R26	OPPOSITION FILED (CORRECTION)	PARTYTYPE : OPPONENT OPPONENT : EDWARDS HIGH VACUUM INTERNATIONAL LIMITED EFFECTIVE DATE : 20000511
EP0655515 A1	20050119	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : IT NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20050119
EP0655515 A1	20080430	LSRE	+PGRI	POSTGRANT: PATENT REINSTATED IN CONTRACTING STATE	COUNTRY OF REF DOCUMENT : IT REINSTATED DATE : 20080301

EP0655515 A1	20080530	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	COUNTRY OF REF DOCUMENT : GB PAYMENT DATE : 20080129 YEAR OF FEE PAYMENT : 20
EP0655515 A1	20080530	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	COUNTRY OF REF DOCUMENT : IT PAYMENT DATE : 20080129 YEAR OF FEE PAYMENT : 20
EP0655515 A1	20080731	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	COUNTRY OF REF DOCUMENT : DE PAYMENT DATE : 20080229 YEAR OF FEE PAYMENT : 20
EP0655515 A1	20080731	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	COUNTRY OF REF DOCUMENT : FR PAYMENT DATE : 20080117 YEAR OF FEE PAYMENT : 20
EP0655515 A1	20081015	LSRE	27A	MAINTAINED AS AMENDED	EFFECTIVE DATE : 20081015
EP0655515 A1	20081216	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : ES REF LEGAL EVENT CODE : FD2A EFFECTIVE DATE : 20000120
EP0655515 A1	20090211	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : GB REF LEGAL EVENT CODE : PE20 EXPIRY DATE : 20090118
EP0655515 A1	20090630	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : GB NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF EXPIRATION OF PROTECTION LAPSED DATE : 20090118
EP0655515 A1	20091030	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : DE NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME- LIMIT LAPSED DATE : 20090116
EP0655515 B1	19990811	LSGT	+	granted / extensions (spc, cpc, pte)	
EP0655515 B2	20081015	LSGT	+	granted / extensions (spc, cpc, pte)	
EP0716160 A1	19960612	LSPB	+	published / reissued	
EP0716160 A1	19960612	LSES	+17P	REQUEST FOR EXAMINATION FILED	EFFECTIVE DATE : 19951107
EP0716160 A1	19970827	LSES	+17Q	FIRST EXAMINATION REPORT	EFFECTIVE DATE : 19970710
EP0716160 A1	20000126	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : SE DESCRIPTION : THE PATENT HAS BEEN ANNULLED BY A DECISION OF A NATIONAL AUTHORITY EFFECTIVE DATE : 20000126
EP0716160 A1	20000126	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : NL DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME- LIMIT EFFECTIVE DATE : 20000126
EP0716160 A1	20000126	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : LI DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME- LIMIT EFFECTIVE DATE : 20000126
EP0716160 A1	20000126	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : ES DESCRIPTION : THE PATENT HAS BEEN ANNULLED BY A DECISION OF A NATIONAL AUTHORITY EFFECTIVE DATE : 20000126

EP0716160 A1	20000126	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : GR DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 20000126
EP0716160 A1	20000126	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : CH DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20000126
EP0716160 A1	20000126	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : AT DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20000126
EP0716160 A1	20000131	LSNP	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : EP
EP0716160 A1	20000426	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : DK DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20000426
EP0716160 A1	20000703	LSLE	-NLV1	NL: LAPSED OR ANNULLED DUE TO FAILURE TO FULFILL THE REQUIREMENTS OF ART. 29P AND 29M OF THE PATENTS ACT	
EP0716160 A1	20000731	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : PL
EP0716160 A1	20001112	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : LU DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 20001112
EP0716160 A1	20001220	LSOP	-26	OPPOSITION FILED	OPPONENT NAME : DEPOSITION SCIENCES, INC. EFFECTIVE DATE : 20001026
EP0716160 A1	20031105	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : GB PAYMENT DATE : 20031105 YEAR OF FEE PAYMENT : 14
EP0716160 A1	20031119	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : FR PAYMENT DATE : 20031119 YEAR OF FEE PAYMENT : 14
EP0716160 A1	20031231	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : DE PAYMENT DATE : 20031231 YEAR OF FEE PAYMENT : 14
EP0716160 A1	20041222	LSRV	-27W	REVOKED	EFFECTIVE DATE : 20041012
EP0716160 A1	20041222	LSRV	-GBPR	GB: PATENT REVOKED UNDER ART. 102 OF THE EP CONVENTION DESIGNATING THE UK AS CONTRACTING STATE	DESCRIPTION : 20041012
EP0716160 B1	20000126	LSGT	+	granted / extensions (spc, cpc, pte)	
JP2004967 A2	19900109	LSPB	+	published / reissued	
JP2004967 A2	20040309	LSLI	S201	REQUEST FOR REGISTRATION OF EXCLUSIVE LICENCE	DESCRIPTION : JAPANESE INTERMEDIATE CODE: R314201

JP2004967 A2	20040315	LSAS	R350	WRITTEN NOTIFICATION OF REGISTRATION OF TRANSFER	DESCRIPTION : JAPANESE INTERMEDIATE CODE: R350
JP2004967 A2	20040525	LSFE	+R250	RECEIPT OF ANNUAL FEES	DESCRIPTION : JAPANESE INTERMEDIATE CODE: R250
JP2004967 A2	20070522	LSFE	+R250	RECEIPT OF ANNUAL FEES	DESCRIPTION : JAPANESE INTERMEDIATE CODE: R250
JP2004967 A2	20080508	LSFE	+FPAY	RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)	DESCRIPTION : PAYMENT UNTIL: 20080512 YEAR OF FEE PAYMENT : 8
JP2004967 A2	20080513	LSFE	+FPAY	RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)	DESCRIPTION : PAYMENT UNTIL: 20090512 YEAR OF FEE PAYMENT : 9
JP2004967 A2	20090208	LSLE	-EXPY	CANCELLATION BECAUSE OF COMPLETION OF TERM	
JP2004967 A2	20090501	LSFE	+FPAY	RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)	DESCRIPTION : PAYMENT UNTIL: 20090512 YEAR OF FEE PAYMENT : 9
JP2695514 B2	19971224	LSGT	+	granted / extensions (spc, cpc, pte)	
JP2695514 B2	20040309	LSLI	S201	REQUEST FOR REGISTRATION OF EXCLUSIVE LICENCE	DESCRIPTION : JAPANESE INTERMEDIATE CODE: R314201
JP2695514 B2	20040315	LSAS	R350	WRITTEN NOTIFICATION OF REGISTRATION OF TRANSFER	DESCRIPTION : JAPANESE INTERMEDIATE CODE: R350
JP2695514 B2	20040928	LSFE	+R250	RECEIPT OF ANNUAL FEES	DESCRIPTION : JAPANESE INTERMEDIATE CODE: R250
JP2695514 B2	20070925	LSFE	+FPAY	RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)	DESCRIPTION : PAYMENT UNTIL: 20080912 YEAR OF FEE PAYMENT : 11
JP2695514 B2	20080924	LSFE	+FPAY	RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)	DESCRIPTION : PAYMENT UNTIL: 20090912 YEAR OF FEE PAYMENT : 12
JP2695514 B2	20090908	LSFE	+FPAY	RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)	DESCRIPTION : PAYMENT UNTIL: 20100912 YEAR OF FEE PAYMENT : 13
JP2695514 B2	20100718	LSLE	-EXPY	CANCELLATION BECAUSE OF COMPLETION OF TERM	
JP3064301 B2	20000712	LSGT	+	granted / extensions (spc, cpc, pte)	
JP3211275 A2	19910917	LSPB	+	published / reissued	
JP3229870 A2	19911011	LSPB	+	published / reissued	
JP6108232 A2	19940419	LSPB	+	published / reissued	
KR920004846 B1	19920619	LSGT	+	granted / extensions (spc, cpc, pte)	
KR920004846 B1	19900122	LSES	A201	REQUEST FOR EXAMINATION	
KR920004846 B1	19911122	LSES	-E902	NOTIFICATION OF REASON FOR REFUSAL	
KR920004846 B1	19920522	LSPB	G160	DECISION TO PUBLISH PATENT APPLICATION	
KR920004846 B1	19920915	LSGT	+E701	DECISION TO GRANT OR	

KR920004846 B1	19921204	LSGT	+GRNT	REGISTRATION OF PATENT RIGHT WRITTEN DECISION TO GRANT	
KR920004846 B1	20080616	LSFE	FPAY	ANNUAL FEE PAYMENT	PAYMENT DATE : 20080617 YEAR OF FEE PAYMENT : 17
KR920004846 B1	20090209	LSLE	-EXPY	EXPIRATION OF TERM	
US4851095 A	19890725	LSGT	+	granted / extensions (spc, cpc, pte)	
US4851095 A	19880421	LSAS	AS	ASSIGNMENT	OWNER NAME : OPTICAL COATING LABORATORY, INC., SANTA ROSA, CA. DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNORS:SCOBAY, MICHAEL A.; SEDDON, RICHARD I.; SEESER, JAMES W.; AND OTHERS; REEL/FRAME:004866/0883; SIGNING DATES FROM 19880325 TO 19880401
US4851095 A	19880421	LSAS	AS	ASSIGNMENT	OWNER NAME : OPTICAL COATING LABORATORY, INC., CALIFORNIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:SCOBAY, MICHAEL A.; SEDDON, RICHARD I.; SEESER, JAMES W.; AND OTHERS; SIGNING DATES FROM 19880325 TO 19880401; REEL/FRAME:004866/0883
US4851095 A	19880720	LSAS	AS	ASSIGNMENT	OWNER NAME : BANK OF AMERICA NATIONAL TRUST AND SAVINGS ASSOCIA DESCRIPTION : SECURITY INTEREST; ASSIGNOR:OPTICAL COATING LABORATORY, INC.; REEL/FRAME:4945/622 EFFECTIVE DATE : 19880309
US4851095 A	19880720	LSAS	AS	ASSIGNMENT	OWNER NAME : BANK OF AMERICA NATIONAL TRUST AND SAVINGS ASSOCIA DESCRIPTION : SECURITY INTEREST; ASSIGNOR:OPTICAL COATING LABORATORY, INC.; REEL/FRAME:004945/0622 EFFECTIVE DATE : 19880309
US4851095 A	19890610	LSGT	PAT1	Patented Case	
US4851095 A	19930125	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US4851095 A	19970125	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US4851095 A	20010124	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 12
US4851095 A	20050224	LSAS	AS	ASSIGNMENT	OWNER NAME : JDS UNIPHASE CORPORATION, CALIFORNIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:OPTICAL COATING LABORATORIES, INC.; REEL/FRAME:015698/0594 EFFECTIVE DATE : 20050223
US5124013 A	19920623	LSGT	+	granted / extensions (spc, cpc, pte)	
US5124013 A	19910410	LSAS	AS	ASSIGNMENT	OWNER NAME : OPTICAL COATING LABORATORY, INC., SANTA ROSA, CA A DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNORS:SEDDON, RICHARD I.; SONDERMAN, JOHN D.; REEL/FRAME:005671/0731; SIGNING DATES FROM 19910202 TO 19910204
US5124013 A	19920612	LSGT	PAT1	Patented Case	
US5124013 A	19951221	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5124013 A	19991222	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8

US5124013 A	20031223	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 12
US5124013 A	20050224	LSAS	AS	ASSIGNMENT	OWNER NAME : JDS UNIPHASE CORPORATION, CALIFORNIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:OPTICAL COATING LABORATORIES, INC.; REEL/FRAME:015698/0594 EFFECTIVE DATE : 20050223
US5225057 A	19930706	LSGT	+	granted / extensions (spc, cpc, pte)	
US5225057 A	19930625	LSGT	PAT1	Patented Case	
US5225057 A	19970131	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5225057 A	20010105	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US5225057 A	20050106	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 12
US5225057 A	20050224	LSAS	AS	ASSIGNMENT	OWNER NAME : JDS UNIPHASE CORPORATION, CALIFORNIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:OPTICAL COATING LABORATORIES, INC.; REEL/FRAME:015698/0594 EFFECTIVE DATE : 20050223
US5618388 A	19970408	LSGT	+	granted / extensions (spc, cpc, pte)	
US5618388 A	20001006	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5618388 A	20041008	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US5618388 A	20050224	LSAS	AS	ASSIGNMENT	OWNER NAME : JDS UNIPHASE CORPORATION, CALIFORNIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:OPTICAL COATING LABORATORIES, INC.; REEL/FRAME:015698/0594 EFFECTIVE DATE : 20050223
US5618388 A	20090408	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5618388 A	20090504	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5618388 A	20090526	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20090408
US5798027 A	19980825	LSGT	+	granted / extensions (spc, cpc, pte)	
US5798027 A	20020222	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5798027 A	20050224	LSAS	AS	ASSIGNMENT	OWNER NAME : JDS UNIPHASE CORPORATION, CALIFORNIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:OPTICAL COATING LABORATORIES, INC.; REEL/FRAME:015698/0594 EFFECTIVE DATE : 20050223
US5798027 A	20060227	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US5798027 A	20100825	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5798027 A	20100920	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5798027 A	20101012	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20100825

US5879519 A	19990309	LSGT	+	granted / extensions (spc, cpc, pte)	
US5879519 A	20020906	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5879519 A	20050224	LSAS	AS	ASSIGNMENT	OWNER NAME : JDS UNIPHASE CORPORATION, CALIFORNIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:OPTICAL COATING LABORATORIES, INC.; REEL/FRAME:015698/0594 EFFECTIVE DATE : 20050223
US5879519 A	20060911	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US5879519 A	20110309	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5879519 A	20110404	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5879519 A	20110426	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20110309

Title: SEMICONDUCTOR WAFER PROCESSING MODULE HAVING AN INCLINED ROTATING WAFER HANDLING TURRET AND A METHOD OF USING THE MODULE

Abstract: Source: US5154730A A sputtering module incorporated into a wafer processing system includes an evacuable housing connectable to one or more other evacuable housings and a wafer handling turret adapted to receive a wafer in horizontal orientation at a load/unload position and rotate the wafer 180 DEG about an inclined axis into vertical orientation at a sputtering position across from a sputtering target. After sputter coating, the wafer handling turret again rotates 180 DEG about the inclined axis to rotatably return the wafer to the horizontal load/unload position, whereupon the wafer is lowered to a horizontal receiving position for subsequent retrieval by an arm extendible into the module from an adjacently situated housing. The wafer handling turret includes three wafer holding rings and a disc-shaped shutter that is rotatably located in front of the target during precleaning.

Classifications:

International (IPC 8-9): B65G49/07 C23C14/50 C23C14/56
H01L21/203 H01L21/285 H01L21/677 H01L21/683

H01L21/687 (Advanced/Invention);

B65G49/07 (Advanced/Non-invention);

B65G49/07 C23C14/50 C23C14/56 H01L21/02

H01L21/67 (Core/Invention)

International (IPC 1-7): C23C13/08 C23C14/50 H01L21/00

H01L21/203 H01L21/285 H01L21/68

CPC: Y10T29/41 H01L21/67748 C23C14/505 C23C14/568

H01L21/67751 H01L21/68707 H01L21/68764 H01L21/68771

H01L21/68785

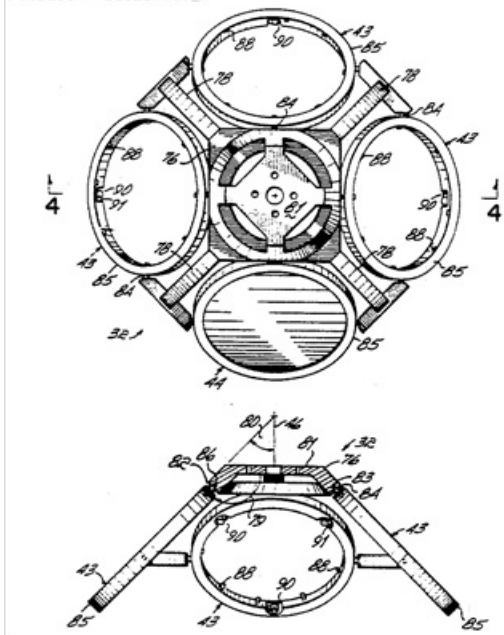
European: C23C14/50B C23C14/56F H01L21/677B6 H01L21/677B8

H01L21/687G H01L21/687S14 H01L21/687S16 H01L21/687S20

US: 118/730 204/298.11 204/298.15 204/298.25 204/298.28

29/25.01

PatBase - US5154730_A



Family:

Publication number	Publication date	Application number	Application date
AT153180 E	19970515	AT19920905171T	19920121
AU199212749 A1	19921230	AU19920012749	19920121
CA2102202 AA	19931101	CA19922102202	19920121
DE69219771 D1	19970619	DE19926019771	19920121
DE69219771 T2	19970828	DE19926019771T	19920121
DK0584076 T3	19970901	DK19920905171T	19920121
EP0584076 A1	19940302	EP19920905171	19920121
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JP6507523 T2	19940825	JP19920505398T	19920121
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US5154730 A	19921013	US19910701771	19910517
WO9221143 A1	19921126	WO1992US00483	19920121

Priority:

US19910701771 19910517 WO1992US00483 19920121

Probable Assignee: TOKYO ELECTRON LTD

Assignee(s): (std): MATERIALS RESEARCH CORP

Assignee(s): MATERIALS RESEARCH CORP ORANGEBURG N Y US ; TOKYO ELECTRON LTD ; HODOS JULIAN ; HURWITT STEVEN ; MATERIALS RESEARCH A OF NY CORP

Inventor(s): (std): HURWITT STEVEN ; HODOS JULIAN

Inventor(s): HODOS JULIAN HOWARD BEACH NY 11414 US ; HURWITT STEVEN PARK RIDGE NJ 07656 US ; JULIAN HODOS ; STEVEN HURWITT

Agent(s): MACRAE AND CO

Designated states: AT AU BB BE BF BG BJ BR CA CF CG CH CI CM CS DE DK ES FI FR GA GB GN GR HU IT JP KP KR LI LK LU MC MG ML MN MR MW NL NO PL RO RU SD SE SN TD TG

Legal status (INPADOC)

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Patent	Date recorded	Event group	Code	Event	Details
AT153180 E	19970515	LSGT	+	granted / extensions (spc, cpc, pte)	
AT153180 E	19971115	LSPB	+UEP	PUBLICATION OF TRANSLATION OF EUROPEAN PATENT SPECIFICATION	

AT153180 E	19991015	LSLE	-REN	CEASED DUE TO NON-PAYMENT OF THE ANNUAL FEE	
AU199212749 A1	19921230	LSPB	+	published / reissued	
CA2102202 AA	19931101	LSPB	+	published / reissued	
CA2102202 AA	19931101	LSNP	+AFNE	NATIONAL PHASE ENTRY	
CA2102202 AA	20000121	LSLE	-FZDE	DEAD	
DE69219771 D1	19980610	LSGT	+8364	NO OPPOSITION DURING TERM OF OPPOSITION	
DE69219771 D1	20000309	LSLE	-8339	CEASED/NON-PAYMENT OF THE ANNUAL FEE	
DE69219771 D1	20000531	LSAS	8327	CHANGE IN THE PERSON/NAME/ADDRESS OF THE PATENT OWNER	OWNER NAME : TOKYO ELECTRON LTD., TOKIO/TOKYO, JP
DE69219771 T2	19970828	LSGT	+	granted / extensions (spc, cpc, pte)	
DK0584076 T3	19970901	LSGT	+	granted / extensions (spc, cpc, pte)	
EP0584076 A1	19940302	LSPB	+	published / reissued	
EP0584076 A1	19940302	LSES	+17P	REQUEST FOR EXAMINATION FILED	EFFECTIVE DATE : 19931119
EP0584076 A1	19961002	LSES	+17Q	FIRST EXAMINATION REPORT	EFFECTIVE DATE : 19960820
EP0584076 A1	19970514	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : ES DESCRIPTION : THE PATENT HAS BEEN ANNULLED BY A DECISION OF A NATIONAL AUTHORITY EFFECTIVE DATE : 19970514
EP0584076 A1	19970514	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : GR DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 19970514
EP0584076 A1	19970515	LSNP	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : EP
EP0584076 A1	19971218	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : FR PAYMENT DATE : 19971218 YEAR OF FEE PAYMENT : 07
EP0584076 A1	19971219	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : SE PAYMENT DATE : 19971219 YEAR OF FEE PAYMENT : 07
EP0584076 A1	19971222	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : NL PAYMENT DATE : 19971222 YEAR OF FEE PAYMENT : 07
EP0584076 A1	19971222	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : AT PAYMENT DATE : 19971222 YEAR OF FEE PAYMENT : 07
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EP0584076 A1	19971230	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : DK PAYMENT DATE : 19971230 YEAR OF FEE PAYMENT : 07
EP0584076 A1	19980108	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : CH PAYMENT DATE : 19980108 YEAR OF FEE PAYMENT : 07
EP0584076 A1	19980109	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : LU PAYMENT DATE : 19980109 YEAR OF FEE PAYMENT : 07
EP0584076 A1	19980115	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : BE PAYMENT DATE : 19980115 YEAR OF FEE PAYMENT : 07

EP0584076 A1	19980506	LSGT	+26N	NO OPPOSITION FILED	
EP0584076 A1	19981130	LSAS	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : PUE OWNER NAME : MATERIALS RESEARCH CORPORATION TRANSFER- TOKYO ELE
EP0584076 A1	19990121	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : AT DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 19990121
EP0584076 A1	19990121	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : GB DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 19990121
EP0584076 A1	19990121	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : LU DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 19990121
EP0584076 A1	19990122	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : SE DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 19990122
EP0584076 A1	19990131	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : CH DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 19990131
EP0584076 A1	19990131	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : LI DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 19990131
EP0584076 A1	19990131	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : BE DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 19990131
EP0584076 A1	19990202	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : DK DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 19990202
EP0584076 A1	19990731	LSLE	-BERE	BE: LAPSED	OWNER NAME : TOKYO ELECTRON LTD (JAPANESE CORP.) EFFECTIVE DATE : 19990131
EP0584076 A1	19990801	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : NL DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 19990801
EP0584076 A1	19990908	LSLE	-GBPC	GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE	EFFECTIVE DATE : 19990121
EP0584076 A1	19990915	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : PL
EP0584076 A1	19990930	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : FR DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 19990930
EP0584076 A1	19991103	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : DE DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 19991103
EP0584076 A1	19991112	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : FR REF LEGAL EVENT CODE : ST
EP0584076 A1	20000501	LSLE	REG	REFERENCE TO A	REF COUNTRY CODE : DK

				NATIONAL CODE	REF LEGAL EVENT CODE : EBP
EP0584076 A1	20050121	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : IT DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 20050121
EP0584076 B1	19970514	LSGT	+	granted / extensions (spc, cpc, pte)	
JP6507523 T2	19940825	LSPB	+	published / reissued	
SG49092 A1	19980518	LSPB	+	published / reissued	
US5154730 A	19921013	LSGT	+	granted / extensions (spc, cpc, pte)	
US5154730 A	19910605	LSAS	AS	ASSIGNMENT	OWNER NAME : MATERIALS RESEARCH CORPORATION A CORPORATION OF DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNORS:HODOS, JULIAN; HURWITT, STEVEN; REEL/FRAME:005740/0129 EFFECTIVE DATE : 19910530
US5154730 A	19940906	LSRE	CC	CERTIFICATE OF CORRECTION	
US5154730 A	19960412	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5154730 A	19980716	LSAS	AS	ASSIGNMENT	OWNER NAME : TOKYO ELECTRON LIMITED, JAPAN DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:SONY CORPORATION; MATERIALS RESEARCH CORPORATION; REEL/FRAME:009306/0971 EFFECTIVE DATE : 19980624
US5154730 A	20000412	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US5154730 A	20041013	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5154730 A	20041111	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5154730 A	20041207	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20041013
WO9221143 A1	19921126	LSPB	+	published / reissued	
WO9221143 A1	19931101	LSNP	ENP	ENTRY INTO THE NATIONAL PHASE IN:	REF COUNTRY CODE : CA REF DOCUMENT NUMBER : 2102202 KIND CODE OF REF DOCUMENT : A FORMAT OF REF DOCUMENT (F/P) : F
WO9221143 A1	19931101	LSNP	+WWE	WIPO INFORMATION: ENTRY INTO NATIONAL PHASE	REF DOCUMENT NUMBER : 2102202 COUNTRY OF REF DOCUMENT : CA
WO9221143 A1	19931119	LSNP	+WWE	WIPO INFORMATION: ENTRY INTO NATIONAL PHASE	REF DOCUMENT NUMBER : 1992905171 COUNTRY OF REF DOCUMENT : EP
WO9221143 A1	19940302	LSPB	+WWP	WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE	REF DOCUMENT NUMBER : 1992905171 COUNTRY OF REF DOCUMENT : EP
WO9221143 A1	19940310	LSWD	REG	REFERENCE TO NATIONAL CODE	REF COUNTRY CODE : DE REF LEGAL EVENT CODE : 8642
WO9221143 A1	19970514	LSGT	+WWG	WIPO INFORMATION: GRANT IN NATIONAL OFFICE	REF DOCUMENT NUMBER : 1992905171 COUNTRY OF REF DOCUMENT : EP

Title: Metallizing machine

Abstract: Source: US5709785A A vacuum-metallizing machine including a metal platter base (17) having an obverse side and a face side. A substrate-receiving platter (2) is resiliently disposed (3, 3b) in a recess on the face side of the platter base (17). The platter (2) receives a substrate to be metallized. A circumferentially-arranged rigid ring (27) of predetermined dimensions and location is disposed on the face side and mates with a ring (29) around a port (11) on the wall of the vacuum chamber which surrounds an opening in the wall. Engagement of these rings aligns the platter base (17) relative to the port (11, 12, 13 and 14). A compliant ring (42) is disposed between the wall and the platter base (17). The obverse side of the platter base (17) and the chamber are resiliently forced (37a, 37b, 37c) into contact with each other with a toggling action (24, 22b, 22) whereby to align the platter base (17) relative to the port, to force the outer diameter of the platter base (17) into metal-to-metal contact with the periphery of the port (11), to align the substrate relative to the port (11) and also to force the compliant ring into sealing engagement with the wall, thus, to form a vacuum tight seal.

Classifications:

International (IPC 8-9): C23C14/50 C23C14/56 (Advanced/Invention); C23C14/50 C23C14/56 (Core/Invention)

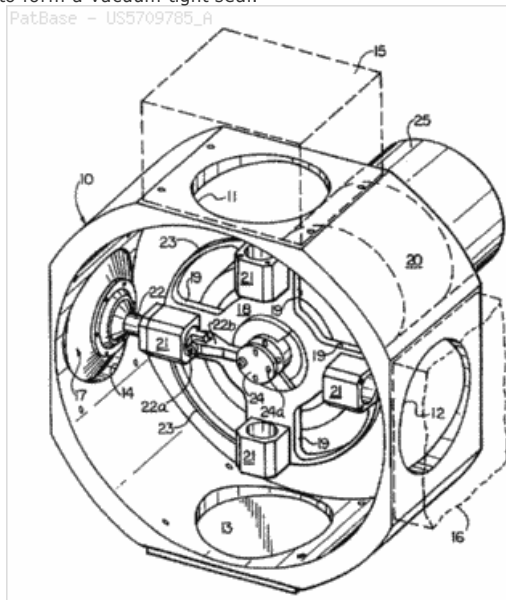
International (IPC 1-7): B05C13/00 C23C14/50 C23C14/56 C23C16/00

CPC: C23C14/505 C23C14/566

European: C23C14/50B C23C14/56D2

US: 118/503 118/719 118/728 118/729 118/730 204/298.15 204/298.23 204/298.25 204/298.26 204/298.27 204/298.28 204/298.29

PatBase - US5709785_A



Family:

Publication number	Publication date	Application number	Application date
US5709785 A	19980120	US19960658170	19960604
WO9641899 A1	19961227	WO1996US08997	19960606

Priority:

US19950000088P 19950608 US19960658170 19960604

Probable Assignee: FIRST LIGHT TECHNOLOGY INC

Assignee(s): (std): FIRST LIGHT TECHNOLOGY INC

Inventor(s): (std): LEBLANC ARTHUR R III ; LEBLANC III ARTHUR R ; MACMILLAN DONALD W ; PARENT DONALD G ; PARENT SCOTT R ; ROSSIGNOL BRIAN C

Inventor(s): LEBLANC ARTHUR R

Designated states: AT BE CH DE DK ES FI FR GB GR IE IT JP LU MC NL PT SE

Legal status (INPADOC)

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Patent	Date recorded	Event group	Code	Event	Details
US5709785 A	19980120	LSGT	+	granted / extensions (spc, cpc, pte)	
US5709785 A	19960604	LSAS	AS	ASSIGNMENT	OWNER NAME : FIRST LIGHT TECHNOLOGY, INC., MAINE DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:LEBLANC, ARTHUR R. III; MACMILLAN, DONALD W.; PARENT, DONALD G.; AND OTHERS; REEL/FRAME:008056/0235 EFFECTIVE DATE : 19960531
US5709785 A	20010308	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5709785 A	20060120	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5709785 A	20060222	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37	

US5709785 A	20060321	LSLE	-FP	CFR 1.362	EFFECTIVE DATE : 20060120
				EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	
WO9641899 A1	19961227	LSPB	+	published / reissued	

Title: SYSTEM FOR PROVIDING A CONTROLLED DEPOSITION ON WAFERS

Abstract: Source: US5759268A A robotic arm assembly in a transport module is expansible to have an effector at its end receive a substrate in a cassette module and is then contracted and rotated with the effector to have the effector face a process module. Planets on a turntable in the process module are rotatable on first parallel axes. The turntable is rotatable on a second axis parallel to the first axes to move successive planets to a position facing the effector. At this position, an alignment assembly is aligned with, but axially displaced from, one of the planets. This assembly is moved axially into coupled relationship with such planet and then rotated to a position aligning the substrate on the effector axially with such planet when the arm assembly is expanded. A lifter assembly aligned with, and initially displaced from, such planet is moved axially to lift the substrate from the effector. The arm assembly is then contracted, rotated with the effector and expanded to receive the next cassette module substrate. The lifter assembly is then moved axially to deposit the substrate on the planet. When the substrates have been deposited on the planets, the planets are individually rotated on the first axes by a stator rotatable on the second axis with the turntable. Guns having a particular disposition relative to the planets provide controlled depositions on the substrates during such planet rotations. The planets and the end effector hold the substrates at peripheral positions displaced from the controlled substrate depositions.

Classifications:

International (IPC 8-9): B65G49/07 C23C14/34 C23C14/50

C23C14/56 F16H57/08 (Advanced/Invention);

B65G49/07 C23C14/34 C23C14/56 (Core/Invention)

International (IPC 1-7): B05C11/00 B05C13/00 B05C5/00

B65G49/07 C23C14/00 C23C14/34 C23C14/50 C23C14/56

F16H57/08 G11B5/48

CPC: Y10S414/135 Y10S414/136 Y10S414/137 Y10S414/139

Y10S414/141 Y10S414/14 C23C14/3464 C23C14/34 C23C14/3407

C23C14/505 C23C14/56 C23C14/566

European: C23C14/34 C23C14/34B C23C14/34F C23C14/50B

C23C14/56 C23C14/56D2

US: 118/319 118/320 118/500 118/503 118/52 118/56 118/620

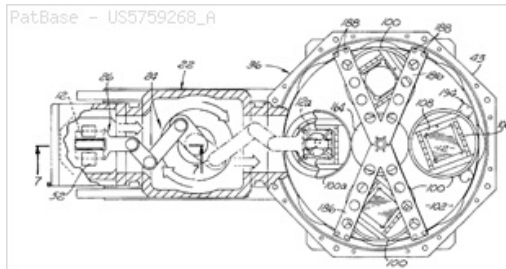
118/621 118/669 118/719 118/728 118/729 118/730 204/192.1 204/192.12 204/298.08 204/298.09 204/298.12 204/298.14

204/298.15 204/298.16 204/298.17 204/298.18 204/298.23 204/298.25 204/298.27 204/298.28 294/1.1 294/213 414/217

414/222 414/222.04 414/223 414/225 414/226 414/226.05 414/331.18 414/744.6 414/935 414/936 414/937 414/939

414/940 414/941 427/240 427/248.1 427/445 901/30 901/43

PatBase - US5759268_A



Family:

Publication number	Publication date	Application number	Application date
EP0773308 A1	19970514	EP19960114165	19960904
JP9184067 A2	19970715	JP19960288469	19961030
US5759268 A	19980602	US19970791449	19970127
US5830272 A	19981103	US19950554459	19951107
US5858101 A	19990112	US19970790735	19970127
US5865969 A	19990202	US19960736232	19961023
US5879460 A	19990309	US19970790736	19970127
US5881668 A	19990316	US19970790732	19970127
US5882403 A	19990316	US19970791502	19970127
US6051066 A	20000418	US19980059883	19980414
US6059517 A	20000509	US19980999937	19980415
US6083357 A	20000704	US19970791503	19970127
US6117238 A	20000912	US19960714804	19960917
US6135051 A	20001024	US19980999939	19980415
US6149367 A	20001121	US19980999936	19980415
US6176987 BA	20010123	US19970788408	19970127
US6235172 BA	20010522	US19990387370	19990831

Priority:

US19950554459 19951107	US19960714804 19960917	US19970788409 19970127
US19970788408 19970127	US19970790732 19970127	US19960736232 19961023
US19970791503 19970127	US19970791502 19970127	US19970790735 19970127
US19980059883 19980414	US19980999936 19980415	US19970791449 19970127
US19970790736 19970127	US19980999937 19980415	US19980999939 19980415
US19990387370 19990831		

Probable Assignee: MKS INSTRUMENTS INC

Assignee(s): (std): APPLIED SCIENCE AND TECH INC ; APPLIED SCIENCE AND TECHNOLOGY ; SPUTTERED FILMS INC ; SHAMROCK TECHNOLOGY CORP

Assignee(s): SPUTTERED FILMS INC (A CA CORP) ; SPUTTERED FILMS INC A CALIFORNIA CORP ; SPUTTERED FILMS INC A CA CORP ; DEUTSCHE BANK NEW YORK BRANCH AG ; FINOVA CAPITAL CORP ; MKS INSTRUMENTS INC ; SUPATAADE FUJIRUMUZI INC ; APPLIED SCIENCE AND TECHNOLOGY INC ; BARCLAYS BANK PLC ; BEGIN ROBERT GEORGE ; CONCEPTS IMPLEMENTATION GROUP MAIN ST ; CONCEPTS IMPLEMENTATION GROUP MAIN ST USA ; CONCEPTS IMPLEMENTATION GROUP MAIN STREET USA

Inventor(s): (std): BEGIN ROBERT GEORGE ; CLARKE PETER J

Inventor(s): PIITAA JIEI KURAUKU ; ROBAATO JIYOOJI BIGIN

Designated states: CH DE FR GB IT LI SE

Legal status (INPADOC)

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Patent	Date recorded	Event group	Code	Event	Details
EP0773308 A1	19970514	LSPB	+	published / reissued	
EP0773308 A1	19970604	LSSES	+17P	REQUEST FOR EXAMINATION FILED	EFFECTIVE DATE : 19970409

EP0773308 A1	19990707	LSSES	+17Q	FIRST EXAMINATION REPORT	EFFECTIVE DATE : 19990520
EP0773308 A1	20020313	LSDW	-18D	DEEMED TO BE WITHDRAWN	EFFECTIVE DATE : 20010731
JP9184067 A2	19970715	LSPB	+	published / reissued	
US5759268 A	19980602	LSGT	+	granted / extensions (spc, cpc, pte)	
US5759268 A	19971103	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY AGREEMENT; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:008766/0855 EFFECTIVE DATE : 19971028
US5759268 A	19980427	LSGT	PAT1	Patented Case	
US5759268 A	19990312	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:009808/0010 EFFECTIVE DATE : 19990304
US5759268 A	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010206/0037 EFFECTIVE DATE : 19990826
US5759268 A	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010206/0041 EFFECTIVE DATE : 19990824
US5759268 A	20011130	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5759268 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US5759268 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US5759268 A	20051123	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US5759268 A	20091202	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 12
US5830272 A	19981103	LSGT	+	granted / extensions (spc, cpc, pte)	
US5830272 A	19951107	LSAS	AS	ASSIGNMENT	OWNER NAME : SPUTTERED FILMS, INC., CALIFORNIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:BEGIN, ROBERT GEORGE; CLARKE, PETER J.; REEL/FRAME:007742/0193 EFFECTIVE DATE : 19951030
US5830272 A	19971103	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY AGREEMENT; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:008766/0855 EFFECTIVE DATE : 19971028
US5830272 A	19990312	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA

					DESCRIPTION : SECURITY INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:009808/0010 EFFECTIVE DATE : 19990304
US5830272 A	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010206/0037 EFFECTIVE DATE : 19990826
US5830272 A	20020502	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5830272 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US5830272 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US5830272 A	20061103	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5830272 A	20061206	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5830272 A	20070102	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20061103
US5858101 A	19990112	LSGT	+	granted / extensions (spc, cpc, pte)	
US5858101 A	19971103	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY AGREEMENT; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:008766/0855 EFFECTIVE DATE : 19971028
US5858101 A	19990312	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:009808/0010 EFFECTIVE DATE : 19990304
US5858101 A	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010206/0037 EFFECTIVE DATE : 19990826
US5858101 A	20020711	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5858101 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US5858101 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608

US5858101 A	20070112	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5858101 A	20070214	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5858101 A	20070313	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20070112
US5865969 A	19990202	LSGT	+	granted / extensions (spc, cpc, pte)	
US5865969 A	19961023	LSAS	AS	ASSIGNMENT	OWNER NAME : SPATTERED FILMS, INC., A CALIFORNIA CORP., CALIFOR DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:CLARKE, PETER J.; REEL/FRAME:008285/0372 EFFECTIVE DATE : 19961019
US5865969 A	19971103	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY AGREEMENT; ASSIGNOR:SPATTERED FILMS, INC.; REEL/FRAME:008766/0855 EFFECTIVE DATE : 19971028
US5865969 A	19990312	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY INTEREST; ASSIGNOR:SPATTERED FILMS, INC.; REEL/FRAME:009808/0010 EFFECTIVE DATE : 19990304
US5865969 A	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPATTERED FILMS, INC.; REEL/FRAME:010206/0037 EFFECTIVE DATE : 19990826
US5865969 A	20020801	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5865969 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US5865969 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US5865969 A	20070202	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5865969 A	20070307	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5865969 A	20070403	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20070202
US5879460 A	19990309	LSGT	+	granted / extensions (spc, cpc, pte)	
US5879460 A	19971103	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY AGREEMENT; ASSIGNOR:SPATTERED FILMS, INC.; REEL/FRAME:008766/0855 EFFECTIVE DATE : 19971028
US5879460 A	19990727	LSRE	CC	CERTIFICATE OF CORRECTION	

US5879460 A	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010206/0037 EFFECTIVE DATE : 19990826
US5879460 A	20020906	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5879460 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US5879460 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US5879460 A	20070309	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5879460 A	20070411	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5879460 A	20070508	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20070309
US5881668 A	19990316	LSGT	+	granted / extensions (spc, cpc, pte)	
US5881668 A	19971103	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY AGREEMENT; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:008766/0855 EFFECTIVE DATE : 19971028
US5881668 A	19990713	LSRE	CC	CERTIFICATE OF CORRECTION	
US5881668 A	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010206/0037 EFFECTIVE DATE : 19990826
US5881668 A	20020913	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5881668 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US5881668 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US5881668 A	20070316	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5881668 A	20070418	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5881668 A	20070515	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY	EFFECTIVE DATE : 20070316

MAINTENANCE FEE					
US5882403 A	19990316	LSGT	+	granted / extensions (spc, cpc, pte)	
US5882403 A	19971103	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY AGREEMENT; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:008766/0855 EFFECTIVE DATE : 19971028
US5882403 A	19990831	LSRE	CC	CERTIFICATE OF CORRECTION	
US5882403 A	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010206/0037 EFFECTIVE DATE : 19990826
US5882403 A	20020913	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US5882403 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US5882403 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US5882403 A	20070316	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US5882403 A	20070418	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US5882403 A	20070515	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20070316
US6051066 A	20000418	LSGT	+	granted / extensions (spc, cpc, pte)	
US6051066 A	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010206/0041 EFFECTIVE DATE : 19990824
US6051066 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US6051066 A	20040130	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US6051066 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US6051066 A	20080418	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US6051066 A	20080519	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees	

US6051066 A	20080610	LSLE	-FP	Under 37 CFR 1.362 EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20080418
US6059517 A	20000509	LSGT	+	granted / extensions (spc, cpc, pte)	
US6059517 A	19811212	LSAS	AS	ASSIGNMENT	OWNER NAME : CONCEPTS IMPLEMENTATION GROUP, MAIN ST., U.S.A. DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNOR:PUBLIC, JOHN Q.; REEL/FRAME:006402/0337 EFFECTIVE DATE : 19811211
US6059517 A	20000501	LSGT	PAT1	Patented Case	
US6059517 A	20000724	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP, MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010991/0389 EFFECTIVE DATE : 19990824
US6059517 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US6059517 A	20031204	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US6059517 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US6059517 A	20071016	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US6059517 A	20111109	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 12
US6059517 A	20160504	LSAS	AS	ASSIGNMENT	OWNER NAME : DEUTSCHE BANK AG NEW YORK BRANCH, NEW YORK DESCRIPTION : SECURITY AGREEMENT; ASSIGNORS:MKS INSTRUMENTS, INC.; NEWPORT CORPORATION; REEL/FRAME:038663/0265 EFFECTIVE DATE : 20160429
US6059517 A	20160504	LSAS	AS	ASSIGNMENT	OWNER NAME : BARCLAYS BANK PLC, NEW YORK DESCRIPTION : SECURITY AGREEMENT; ASSIGNORS:MKS INSTRUMENTS, INC.; NEWPORT CORPORATION; REEL/FRAME:038663/0139 EFFECTIVE DATE : 20160429
US6083357 A	20000704	LSGT	+	granted / extensions (spc, cpc, pte)	
US6083357 A	19971103	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY AGREEMENT; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:008766/0855 EFFECTIVE DATE : 19971028
US6083357 A	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010206/0041 EFFECTIVE DATE : 19990824
US6083357 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF

					ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US6083357 A	20040105	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US6083357 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US6083357 A	20080704	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US6083357 A	20080804	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US6083357 A	20080826	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20080704
US6117238 A	20000912	LSGT	+	granted / extensions (spc, cpc, pte)	
US6117238 A	19960917	LSAS	AS	ASSIGNMENT	OWNER NAME : SPATTERED FILMS, INC. (A CA CORP.), CALIFORNIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:BEGIN,ROBERT GEORGE; REEL/FRAME:008228/0259 EFFECTIVE DATE : 19960910
US6117238 A	19971103	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY AGREEMENT; ASSIGNOR:SPATTERED FILMS, INC.; REEL/FRAME:008766/0855 EFFECTIVE DATE : 19971028
US6117238 A	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPATTERED FILMS, INC.; REEL/FRAME:010206/0041 EFFECTIVE DATE : 19990824
US6117238 A	20000825	LSGT	PAT1	Patented Case	
US6117238 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US6117238 A	20040913	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US6117238 A	20041109	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20040912
US6135051 A	20001024	LSGT	+	granted / extensions (spc, cpc, pte)	
US6135051 A	19811212	LSAS	AS	ASSIGNMENT	OWNER NAME : CONCEPTS IMPLEMENTATION GROUP, MAIN STREET, U.S.A. DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNOR:PUBLIC,JOHN Q.; REEL/FRAME:006402/0339 EFFECTIVE DATE : 19811211
US6135051 A	20000724	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP, MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPATTERED FILMS, INC.; REEL/FRAME:010991/0389 EFFECTIVE DATE : 19990824

US6135051 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US6135051 A	20040325	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US6135051 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US6135051 A	20081024	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	EFFECTIVE DATE : 20081024
US6135051 A	20081124	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US6135051 A	20081216	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	
US6149367 A	20001121	LSGT	+	granted / extensions (spc, cpc, pte)	
US6149367 A	19811212	LSAS	AS	ASSIGNMENT	OWNER NAME : CONCEPTS IMPLEMENTATION GROUP, MAIN ST., U.S.A. DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNOR:PUBLIC, JOHN Q.; REEL/FRAME:006402/0336 EFFECTIVE DATE : 19811211
US6149367 A	20000724	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP, MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010991/0389 EFFECTIVE DATE : 19990824
US6149367 A	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US6149367 A	20040517	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US6149367 A	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US6149367 A	20081121	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	EFFECTIVE DATE : 20081121
US6149367 A	20081222	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US6149367 A	20090113	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	
US6176987 BA	20010123	LSGT	+	granted / extensions (spc, cpc, pte)	
US6176987 BA	19971103	LSAS	AS	ASSIGNMENT	OWNER NAME : FINOVA CAPITAL CORPORATION, CALIFORNIA DESCRIPTION : SECURITY AGREEMENT; ASSIGNOR:SPUTTERED FILMS, INC.;

					REEL/FRAME:008766/0855 EFFECTIVE DATE : 19971028
US6176987 BA	19990901	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:010206/0041 EFFECTIVE DATE : 19990824
US6176987 BA	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US6176987 BA	20040609	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US6176987 BA	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US6176987 BA	20090123	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US6176987 BA	20090223	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US6176987 BA	20090317	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20090123
US6235172 BA	20010522	LSGT	+	granted / extensions (spc, cpc, pte)	
US6235172 BA	20010503	LSGT	PAT1	Patented Case	
US6235172 BA	20010622	LSAS	AS	ASSIGNMENT	OWNER NAME : SHAMROCK TECHNOLOGY CORP., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SPUTTERED FILMS, INC.; REEL/FRAME:011923/0431 EFFECTIVE DATE : 20010125
US6235172 BA	20030113	LSAS	AS	ASSIGNMENT	OWNER NAME : APPLIED SCIENCE AND TECHNOLOGY, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:SHAMROCK TECHNOLOGY CORP.; REEL/FRAME:013645/0778 EFFECTIVE DATE : 20021216
US6235172 BA	20041119	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US6235172 BA	20050701	LSAS	AS	ASSIGNMENT	OWNER NAME : MKS INSTRUMENTS, INC., MASSACHUSETTS DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:APPLIED SCIENCE AND TECHNOLOGY, INC.; REEL/FRAME:016700/0252 EFFECTIVE DATE : 20050608
US6235172 BA	20081124	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US6235172 BA	20121121	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 12

Title: Process and machine for coating ophthalmic lenses

Abstract: Source: US6129042A In a process and machine for coating a surface of an ophthalmic lens, the lens is manually loaded by the operator to a wash/dry station within an enclosure of the coating machine. Thereafter, the machine computer controls the entire process. The machine is closed to minimize the introduction of external contaminants into the machine. Positive pressure and filtration of air is initiated in the enclosure before washing the lens. The loaded lens is washed and dried at the wash/dry station. The dried lens is transferred to a coating station within the enclosure and coated. The coated lens is transferred to a curing oven within the enclosure and cured. The cured lens is then discharged from the curing oven and the machine for collection by the operator. The machine can simultaneously process three lenses, one in the wash/dry/coat section, one in the cure section and one at a pick-off station between the wash/dry/coat and cure sections of the machine. A coated and cured lens can be produced in approximately sixty seconds.

Classifications:

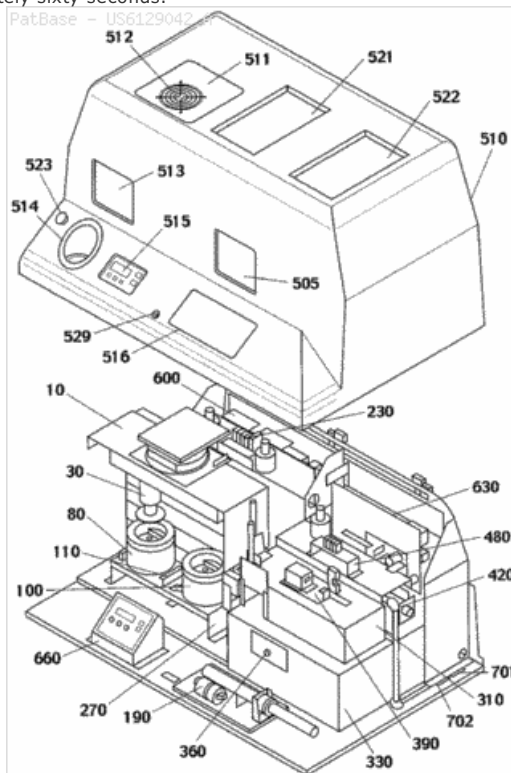
International (IPC 8-9): B29D11/00 (Advanced/Invention)

International (IPC 1-7): B05B13/04 B05C11/02 B05D1/02 B05D3/06 B05D5/06

CPC: B29D11/00903

European: B29D11/00K6B

US: 118/319 118/320 118/52 118/56 118/694 118/712 427/164 427/168 427/240



Family:

Publication number	Publication date	Application number	Application date
US6129042 A	20001010	US19970966157	19971107
US6326054 BA	20011204	US20000542766	20000404

Priority:

US19960030711P 19961108 US19970966157 19971107 US20000542766 20000404

Probable Assignee: COBURN TECHNOLOGIES INC

Assignee(s): (std): GERBER COBURN OPTICAL INC ; COBURN OPTICAL IND

Assignee(s): PNC BANK NATIONAL ASSOCIATION ; COBURN OPTICAL IND INC ; LENS TECHNOLOGY I LLC ; COBURN OPTICAL INDUSTRIES INC ; GERBER COBURN OPTICAL INT INC ; GERBER SCIENTIFIC INC ; GERBER SCIENTIFIC INT INC ; COBURN TECHNOLOGIES INC ; CITIZENS BANK OF MASSACHUSETTS

Inventor(s): (std): BRANCH DANIEL P ; SMITH KENNETH L

Legal status (INPADOC)

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Patent	Date recorded	Event group	Code	Event	Details
US6129042 A	20001010	LSGT	+	granted / extensions (spc, cpc, pte)	
US6129042 A	19971107	LSAS	AS	ASSIGNMENT	OWNER NAME : COBURN OPTICAL INDUSTRIES, INC., OKLAHOMA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:SMITH, KENNETH L.; BRANCH, DANIEL P.; REEL/FRAME:008816/0504 EFFECTIVE DATE : 19971107
US6129042 A	20000921	LSGT	PAT1	Patented Case	
US6129042 A	20020211	LSAS	AS	ASSIGNMENT	OWNER NAME : GERBER COBURN OPTICAL, INC., CONNECTICUT DESCRIPTION : MERGER AND CHANGE OF NAME; ASSIGNORS:GERBER OPTICAL, INC.

					(MERGED INTO) A C T CORP.; COBURN OPTICAL INDUSTRIES, INC. A D E CORP.; REEL/FRAME:012795/0979 EFFECTIVE DATE : 19980430
US6129042 A	20020211	LSAS	AS	ASSIGNMENT	OWNER NAME : LENS TECHNOLOGY I, LLC, CALIFORNIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:GERBER COBURN OPTICAL, INC.; REEL/FRAME:012569/0167 EFFECTIVE DATE : 20020107
US6129042 A	20040722	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US6129042 A	20060109	LSAS	AS	ASSIGNMENT	OWNER NAME : CITIZENS BANK OF MASSACHUSETTS, MASSACHUSETTS DESCRIPTION : INTELLECTUAL PROPERTY SECURITY AGREEMENT; ASSIGNOR:GERBER SCIENTIFIC, INC.; REEL/FRAME:016976/0965 EFFECTIVE DATE : 20051031
US6129042 A	20080404	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US6129042 A	20110823	LSAS	AS	ASSIGNMENT	OWNER NAME : GERBER SCIENTIFIC INTERNATIONAL INC., CONNECTICUT DESCRIPTION : TERMINATION AND RELEASE OF SECURITY INTEREST IN INTELLECTUAL PROPERTY; ASSIGNOR:RBS CITIZENS, N.A. ANATIONAL BANKING ASSOCIATION AND SUCCESSOR TO CITIZENS BANK OF MASSACHUSETTS, A MASSACHUSETTS BANK; REEL/FRAME:026795/0056 EFFECTIVE DATE : 20110822
US6129042 A	20110823	LSAS	AS	ASSIGNMENT	OWNER NAME : GERBER SCIENTIFIC INC., CONNECTICUT DESCRIPTION : TERMINATION AND RELEASE OF SECURITY INTEREST IN INTELLECTUAL PROPERTY; ASSIGNOR:RBS CITIZENS, N.A. ANATIONAL BANKING ASSOCIATION AND SUCCESSOR TO CITIZENS BANK OF MASSACHUSETTS, A MASSACHUSETTS BANK; REEL/FRAME:026795/0056 EFFECTIVE DATE : 20110822
US6129042 A	20120410	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 12
US6326054 BA	20011204	LSGT	+	granted / extensions (spc, cpc, pte)	
US6326054 BA	20011019	LSAS	AS	ASSIGNMENT	OWNER NAME : GERBER COBURN OPTICAL, INC., CONNECTICUT DESCRIPTION : MERGER CHANGE OF NAME; ASSIGNORS:GERBER OPTICAL,INC. (MERGED INTO); COBURN OPTICAL INDUSTRIES, INC. (CHANGE NAME TO); REEL/FRAME:012293/0328 EFFECTIVE DATE : 19980430
US6326054 BA	20050530	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US6326054 BA	20060109	LSAS	AS	ASSIGNMENT	OWNER NAME : CITIZENS BANK OF MASSACHUSETTS, MASSACHUSETTS DESCRIPTION : INTELLECTUAL PROPERTY SECURITY AGREEMENT; ASSIGNOR:GERBER SCIENTIFIC, INC.; REEL/FRAME:016987/0139 EFFECTIVE DATE : 20051031
US6326054 BA	20091204	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US6326054 BA	20100104	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US6326054 BA	20100126	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20091204
US6326054 BA	20101231	LSAS	AS	ASSIGNMENT	OWNER NAME : GERBER COBURN OPTICAL

					INTERNATIONAL, INC., CONNECT DESCRIPTION : TERMINATION AND RELEASE OF SECURITY INTEREST IN INTELLECTUAL PROPERTY; ASSIGNOR:RBS CITIZENS, N.A.; REEL/FRAME:025642/0153 EFFECTIVE DATE : 20101231
US6326054 BA	20101231	LSAS	AS	ASSIGNMENT	OWNER NAME : GERBER SCIENTIFIC INC., CONNECTICUT DESCRIPTION : TERMINATION AND RELEASE OF SECURITY INTEREST IN INTELLECTUAL PROPERTY; ASSIGNOR:RBS CITIZENS, N.A.; REEL/FRAME:025642/0153 EFFECTIVE DATE : 20101231
US6326054 BA	20101231	LSAS	AS	ASSIGNMENT	OWNER NAME : GERBER SCIENTIFIC INTERNATIONAL, INC., CONNECTICUT DESCRIPTION : TERMINATION AND RELEASE OF SECURITY INTEREST IN INTELLECTUAL PROPERTY; ASSIGNOR:RBS CITIZENS, N.A.; REEL/FRAME:025642/0153 EFFECTIVE DATE : 20101231
US6326054 BA	20101231	LSAS	AS	ASSIGNMENT	OWNER NAME : COBURN TECHNOLOGIES, INC., CONNECTICUT DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:GERBER SCIENTIFIC INTERNATIONAL, INC; REEL/FRAME:025763/0344 EFFECTIVE DATE : 20101231
US6326054 BA	20110405	LSAS	AS	ASSIGNMENT	OWNER NAME : PNC BANK, NATIONAL ASSOCIATION, PENNSYLVANIA DESCRIPTION : SECURITY AGREEMENT; ASSIGNORS:COBURN TECHNOLOGIES, INC.; COBURN TECHNOLOGIES INTERNATIONAL, INC.; REEL/FRAME:026079/0254 EFFECTIVE DATE : 20101231

Title: Method and apparatus for vacuum coating plastic parts

Abstract: Source: US6258218B A method and apparatus for vacuum coating plastic lens elements employs Meissner traps and a drum work holder configuration for effectively condensing water vapor in the system.

Classifications:

International (IPC 8-9): C23C14/20 C23C14/50

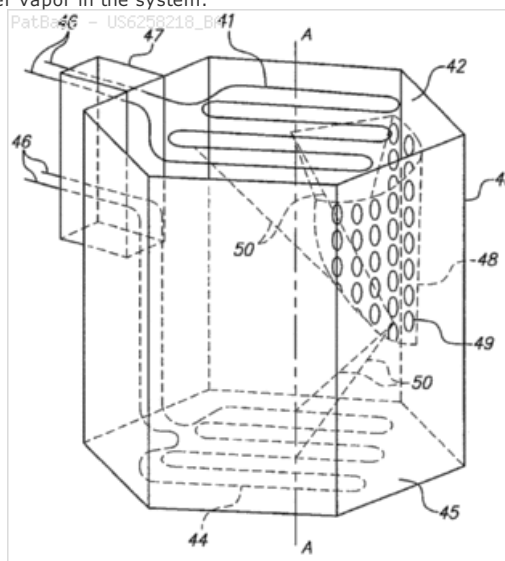
C23C14/56 (Advanced/Invention)

International (IPC 1-7): C23C14/34

CPC: C23C14/205 C23C14/505 C23C14/564

European: C23C14/20B C23C14/50B C23C14/56D

US: 204/192.12 204/298.09 204/298.15 204/298.28



Family:

Publication number	Publication date	Application number	Application date
US6258218 BA	20010710	US19990422948	19991022

Priority:

US19990422948 19991022

Probable Assignee: CARL ZEISS VISION AUSTRALIA HOLDINGS LTD

Assignee(s): (std): SOLA INT HOLDINGS

Assignee(s): SOLA INT HOLDINGS LTD ; SOLA INTERNATIONAL HOLDINGS LTD ; SOLA INT INC ; CARL ZEISS VISION AUSTRALIA HOLDINGS LTD ; SOLA INT

Inventor(s): (std): BURTON CLIVE H

Legal status (INPADOC)

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Patent	Date recorded	Event group	Code	Event	Details
US6258218 BA	20010710	LSGT	+	granted / extensions (spc, cpc, pte)	
US6258218 BA	20000105	LSAS	AS	ASSIGNMENT	OWNER NAME : SOLA INTERNATIONAL HOLDINGS LTD., AUSTRALIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR: BURTON, CLIVE H.; REEL/FRAME: 010475/0192 EFFECTIVE DATE : 19991110
US6258218 BA	20010625	LSGT	PAT1	Patented Case	
US6258218 BA	20011105	LSAS	AS	ASSIGNMENT	OWNER NAME : SOLA INTERNATIONAL, INC., CALIFORNIA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR: SOLA INTERNATIONAL HOLDINGS LTD.; REEL/FRAME: 012295/0378 EFFECTIVE DATE : 20011018
US6258218 BA	20041215	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US6258218 BA	20081207	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US6258218 BA	20100601	LSAS	AS	ASSIGNMENT	OWNER NAME : CARL ZEISS VISION AUSTRALIA HOLDINGS LTD., AUSTRALIA DESCRIPTION : CHANGE OF NAME; ASSIGNOR: SOLA INTERNATIONAL HOLDINGS LTD.; REEL/FRAME: 024463/0935 EFFECTIVE DATE : 20060710
US6258218 BA	20100601	LSAS	AS	ASSIGNMENT	OWNER NAME : CARL ZEISS VISION AUSTRALIA HOLDINGS LTD., AUSTRALIA

					DESCRIPTION : CHANGE OF NAME; ASSIGNOR:SOLA INTERNATIONAL HOLDINGS LTD.; REEL/FRAME:024463/0935 EFFECTIVE DATE : 20060710
US6258218 BA	20100601	LSAS	AS	ASSIGNMENT	OWNER NAME : CARL ZEISS VISION AUSTRALIA HOLDINGS LTD.,AUSTRALI DESCRIPTION : CHANGE OF NAME; ASSIGNOR:SOLA INTERNATIONAL HOLDINGS LTD.; REEL/FRAME:24463/935 EFFECTIVE DATE : 20060710
US6258218 BA	20121220	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 12

Title: METHOD AND APPARATUS FOR PRODUCING AN OPTICALLY EFFECTIVE SYSTEM OF LAYERS ON BOTH SIDES OF A SUBSTRATE

Abstract: Source: US2004089537A A method and apparatus for producing an optically effective system of layers on a substrate, such as a lens for use in an optical device. A plasma supported sputter deposition process is employed which, for the purpose of reducing damage to the rear side (1b) first applies a protective layer (2) to the rear side and then applies a system of layers (3) on the front side (1a) of the substrate (1). The apparatus includes an evacuable sputter chamber and a substrate holder (5) with receiving elements (6) for the substrates, and the receiving elements are mounted to permit rotation about two mutually perpendicular axes.

Classifications:

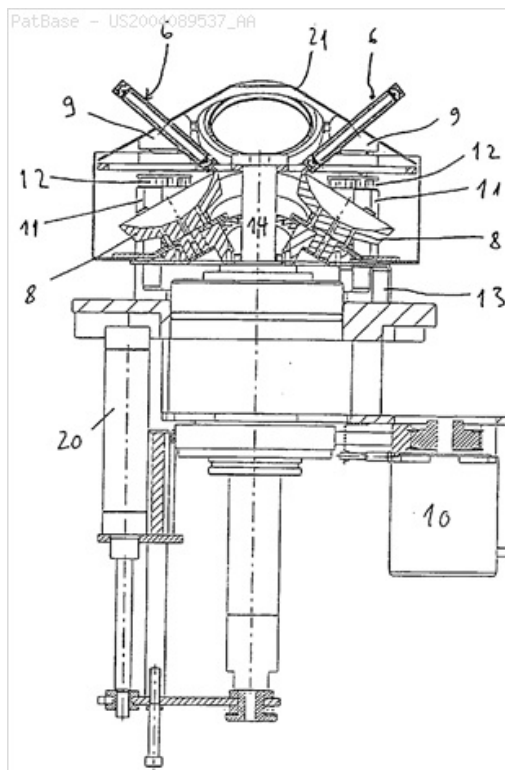
International (IPC 8-9): C23C14/06 C23C14/08 C23C14/34 C23C14/50 C23C14/56 G02B1/10 G02B1/11 (Advanced/Invention); G02B1/10 (Advanced/Non-invention); G02B1/10 (Core/Invention)

International (IPC 1-7): C23C14/06 C23C14/08 C23C14/32 C23C14/34 C23C14/50 C23C14/56 G02B1/10 G02B1/11

CPC: C23C14/505 C23C14/564 G02B1/11 G02B1/10

European: C23C14/50B C23C14/56D G02B1/11

US: 204/192.12 204/192.16 204/192.23 204/192.26 204/298.26 204/298.27 204/298.28



Family:

Publication number	Publication date	Application number	Application date
AT406468 E	20080915	AT20020751081T	20020628
CN1223700 C	20051019	CN20028004913	20020628
CN1491296 A	20040421	CN20028004913	20020628
DE50212709 D1	20081009	DE20025012709	20020628
EP1275751 A1	20030115	EP20010810698	20010713
EP1407059 A1	20040414	EP20020751081	20020628
EP1407059 B1	20080827	EP20020751081	20020628
JP2004534154 T2	20041111	JP20030512459T	20020628
JP3952017 B2	20070801	JP20030512459T	20020628
KR100570851 B1	20060412	KR20037009378	20020628
KR20040007436 A	20040124	KR20037009378	20020628
US2004089537 AA	20040513	US20030700996	20031104
US6878243 BB	20050412	US20030700996	20031104
WO03006704 A1	20030123	WO2002EP07141	20020628

Priority:

EP20010810698 20010713 EP20020751081 20020628 WO2002EP07141 20020628

Probable Assignee: SATIS VACUUM IND VERTRIEBS AG

Assignee(s): (std): BREME FRANK ; SATIS VACUUM IND VERTRIEBS AG

Assignee(s): SATIS VACUUM INDUSTRIES VERTRIEBS AG ; TIS VACUUM INDUSTRIES VERTRIEBS AG SA ; SATIS VACUUM IND

Inventor(s): (std): BREME F ; BREME FRANK

Inventor(s): F BREME

Agent(s): SCHAAD BALASS MENZL AND PARTNER AG

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE 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 NE NL NO NZ OM PH PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW

Legal status (INPADOC)

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Patent Date recorded Event group Code Event Details

AT406468 E 20080915 LSGT + granted /

				extensions (spc, cpc, pte)	
AT406468 E	20100915	LSLE	-REN	CEASED DUE TO NON-PAYMENT OF THE ANNUAL FEE	
CN1223700 C	20051019	LSGT	+	granted / extensions (spc, cpc, pte)	
CN1223700 C	20040421	LSPB	+C06	PUBLICATION	
CN1223700 C	20051019	LSGT	+C14	GRANT OF PATENT OR UTILITY MODEL	
CN1491296 A	20040421	LSPB	+	published / reissued	
DE50212709 D1	20090917	LSGT	+8364	NO OPPOSITION DURING TERM OF OPPOSITION	
EP1275751 A1	20030115	LSPB	+	published / reissued	
EP1275751 A1	20031001	LSFE	+AKX	PAYMENT OF DESIGNATION FEES	
EP1275751 A1	20040512	LSDW	-18D	DEEMED TO BE WITHDRAWN	EFFECTIVE DATE : 20030716
EP1407059 A1	20040414	LSPB	+	published / reissued	
EP1407059 A1	20040414	LSES	+17P	REQUEST FOR EXAMINATION FILED	EFFECTIVE DATE : 20030530
EP1407059 A1	20070516	LSES	+17Q	FIRST EXAMINATION REPORT	EFFECTIVE DATE : 20070417
EP1407059 A1	20080827	LSGT	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : GB REF LEGAL EVENT CODE : FG4D TEXT : NOT ENGLISH
EP1407059 A1	20080831	LSNP	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : EP
EP1407059 A1	20081001	LSGT	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : IE REF LEGAL EVENT CODE : FG4D TEXT : LANGUAGE OF EP DOCUMENT: GERMAN
EP1407059 A1	20090130	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : ES NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20081208
EP1407059 A1	20090130	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : NL NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20080827
EP1407059 A1	20090227	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : FI NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20080827
EP1407059 A1	20090401	LSWD	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : IE REF LEGAL EVENT CODE : FD4D
EP1407059 A1	20090430	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : DK NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20080827
EP1407059 A1	20090430	LSLE	-PG25	LAPSED IN A CONTRACTING	COUNTRY OF REF DOCUMENT : IE

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EP1407059 A1	20090529	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : PT NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20090127
EP1407059 A1	20090805	LSGT	+26N	NO OPPOSITION FILED	EFFECTIVE DATE : 20090528
EP1407059 A1	20091231	LSLE	-BERE	BE: LAPSED	PARTY TYPE : OWNER REF COUNTRY CODE : EP OWNER : SATIS VACUUM INDUSTRIES VERTRIEBS - A.G. EFFECTIVE DATE : 20090630
EP1407059 A1	20100129	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : MC NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20090630
EP1407059 A1	20100129	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : SE NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20081127
EP1407059 A1	20100630	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : BE NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20090630
EP1407059 A1	20100831	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : AT NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20090628
EP1407059 A1	20101029	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : GR NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20081128
EP1407059 A1	20110429	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : LU NOTIFICATION OF LAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20090628
EP1407059 A1	20110831	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : TR NOTIFICATION OF LAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT LAPSED DATE : 20080827
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EP1407059 A1	20151030	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID	COUNTRY OF REF DOCUMENT : CH

				TO NATIONAL OFFICE	PAYMENT DATE : 20150828 YEAR OF FEE PAYMENT : 14
EP1407059 A1	20160627	LSFE	REG	REFERENCE TO A NATIONAL CODE	COUNTRY OF REF DOCUMENT : FR REF COUNTRY CODE : FR REF LEGAL EVENT CODE : PLFP YEAR OF FEE PAYMENT : 15
EP1407059 A1	20160729	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	COUNTRY OF REF DOCUMENT : GB PAYMENT DATE : 20160621 YEAR OF FEE PAYMENT : 15
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EP1407059 A1	20160831	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	COUNTRY OF REF DOCUMENT : FR PAYMENT DATE : 20160627 YEAR OF FEE PAYMENT : 15
EP1407059 A1	20161031	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	COUNTRY OF REF DOCUMENT : IT PAYMENT DATE : 20160628 YEAR OF FEE PAYMENT : 15
EP1407059 A1	20170131	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : PL
EP1407059 A1	20170428	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : LI NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20160630
EP1407059 A1	20170428	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	COUNTRY OF REF DOCUMENT : CH NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES LAPSED DATE : 20160630
EP1407059 A1	20170621	LSFE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : FR REF LEGAL EVENT CODE : PLFP YEAR OF FEE PAYMENT : 16
EP1407059 B1	20080827	LSGT	+	granted / extensions (spc, cpc, pte)	
JP2004534154 T2	20041111	LSPB	+	published / reissued	
JP3952017 B2	20070801	LSGT	+	granted / extensions (spc, cpc, pte)	
JP3952017 B2	20060810	LSSES	-A131	NOTIFICATION OF REASONS FOR REFUSAL	TEXT : JAPANESE INTERMEDIATE CODE: A131 EFFECTIVE DATE : 20060809
JP3952017 B2	20070209	LSRE	A521	WRITTEN AMENDMENT	TEXT : JAPANESE INTERMEDIATE CODE: A523 EFFECTIVE DATE : 20070208
JP3952017 B2	20070312	LSGT	+TRDD	DECISION OF GRANT OR REJECTION WRITTEN	
JP3952017 B2	20070323	LSGT	+A01	WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL)	TEXT : JAPANESE INTERMEDIATE CODE: A01 EFFECTIVE DATE : 20070322
JP3952017 B2	20070510	LSFE	+A61	FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)	TEXT : JAPANESE INTERMEDIATE CODE: A61 EFFECTIVE DATE : 20070416
JP3952017 B2	20070511	LSGT	+R150	CERTIFICATE OF PATENT OR REGISTRATION OF UTILITY MODEL	TEXT : JAPANESE INTERMEDIATE CODE: R150
JP3952017 B2	20100511	LSFE	+FPAY	RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)	YEAR OF FEE PAYMENT : 4

JP3952017 B2	20110517	LSFE	+FPAY	RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)	YEAR OF FEE PAYMENT : 5
JP3952017 B2	20120515	LSFE	+FPAY	RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)	YEAR OF FEE PAYMENT : 6
JP3952017 B2	20130502	LSFE	+FPAY	RENEWAL FEE PAYMENT (EVENT DATE IS RENEWAL DATE OF DATABASE)	YEAR OF FEE PAYMENT : 6
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JP3952017 B2	20140507	LSFE	+R250	RECEIPT OF ANNUAL FEES	TEXT : JAPANESE INTERMEDIATE CODE: R250
JP3952017 B2	20150519	LSFE	+R250	RECEIPT OF ANNUAL FEES	TEXT : JAPANESE INTERMEDIATE CODE: R250
JP3952017 B2	20160517	LSFE	+R250	RECEIPT OF ANNUAL FEES	TEXT : JAPANESE INTERMEDIATE CODE: R250
JP3952017 B2	20170516	LSFE	+R250	RECEIPT OF ANNUAL FEES	TEXT : JAPANESE INTERMEDIATE CODE: R250
KR100570851 B1	20060412	LSGT	+	granted / extensions (spc, cpc, pte)	
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KR100570851 B1	20051024	LSES	-E902	NOTIFICATION OF REASON FOR REFUSAL	
KR100570851 B1	20060126	LSGT	+E701	DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT	
KR100570851 B1	20060406	LSGT	+GRNT	WRITTEN DECISION TO GRANT	
KR100570851 B1	20120330	LSFE	FPAY	ANNUAL FEE PAYMENT	PAYMENT DATE : 20120402 YEAR OF FEE PAYMENT : 7
KR100570851 B1	20130328	LSFE	FPAY	ANNUAL FEE PAYMENT	PAYMENT DATE : 20130328 YEAR OF FEE PAYMENT : 8
KR100570851 B1	20160324	LSFE	FPAY	ANNUAL FEE PAYMENT	PAYMENT DATE : 20160324 YEAR OF FEE PAYMENT : 11
KR20040007436 A	20040124	LSPB	+	published / reissued	
US2004089537 AA	20040513	LSPB	+	published / reissued	
US2004089537 AA	20050323	LSGT	PAT1	Patented Case	
US6878243 BB	20050412	LSGT	+	granted / extensions (spc, cpc, pte)	
US6878243 BB	20031104	LSAS	AS	ASSIGNMENT	OWNER NAME : SATIS VACUUM INDUSTRIES VERTRIEBS AG, SWITZERLAND DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:BREME, FRANK; REEL/FRAME:014670/0217 EFFECTIVE DATE : 20030916
US6878243 BB	20080929	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US6878243 BB	20120927	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
US6878243 BB	20161003	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 12
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WO03006704 A1	20040414	LSPB	+WWP	WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE	REF DOCUMENT NUMBER : 2002751081 COUNTRY OF REF DOCUMENT : EP
WO03006704 A1	20060126	LSGT	+WWG	WIPO INFORMATION: GRANT IN NATIONAL OFFICE	REF DOCUMENT NUMBER : 1020037009378 COUNTRY OF REF DOCUMENT : KR
WO03006704 A1	20080827	LSGT	+WWG	WIPO INFORMATION: GRANT IN NATIONAL OFFICE	REF DOCUMENT NUMBER : 2002751081 COUNTRY OF REF DOCUMENT : EP

Title: ROTARY FAST TOOL SERVO SYSTEM AND METHODS

Abstract: Source: US2004035266A A high bandwidth rotary fast tool servo provides tool motion in a direction nominally parallel to the surface-normal of a workpiece at the point of contact between the cutting tool and workpiece. Three or more flexure blades having all ends fixed are used to form an axis of rotation for a swing arm that carries a cutting tool at a set radius from the axis of rotation. An actuator rotates a swing arm assembly such that a cutting tool is moved in and away from the lathe-mounted, rotating workpiece in a rapid and controlled manner in order to machine the workpiece. A pair of position sensors provides rotation and position information for a swing arm to a control system. A control system commands and coordinates motion of the fast tool servo with the motion of a spindle, rotating table, cross-feed slide, and in-feed slide of a precision lathe.

Classifications:

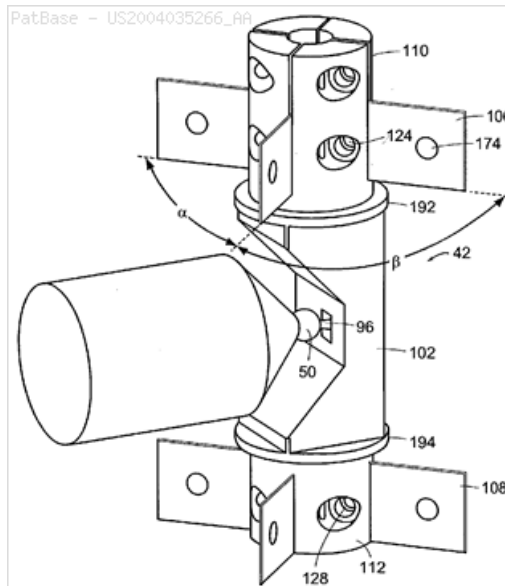
International (IPC 8-9): B23B29/04 B23B29/16 B23B5/00 B23B5/40 B23Q1/36 B23Q1/52 B23Q1/70 B23Q5/22 B23Q5/28 B24B13/04 H02K21/00 H02K41/00 H02K41/02 H02K7/09 (Advanced/Invention); B23B29/16 B23B5/00 (Advanced/Non-invention); B23B29/00 B23B5/00 B23Q1/00 B23Q1/25 B23Q1/26 B23Q5/22 B24B13/00 H02K21/00 H02K41/00 H02K41/02 H02K7/09 (Core/Invention); B23B29/00 (Core/Non-invention)

International (IPC 1-7): B23B29/12 B23B3/00 B23B5/00 B23Q5/22 B23Q5/36 B24B13/04

CPC: B23B5/40 B23Q2210/002 B23B29/04 B23B5/00 B23Q1/36 B23Q1/52 B23Q1/70 B23Q5/22 B23Q5/28 B24B13/046 H02K21/38 B23Q1/34 H02K26/00 Y10T82/10 Y10T82/2583 Y10T82/2585 Y10T82/148

European: B23B29/04 B23B5/00 B23B5/40 B23Q1/34 B23Q1/36 B23Q1/52 B23Q1/70 B23Q5/22 B23Q5/28 B24B13/04D H02K21/38 H02K26/00 H02K33/12

US: 310/12 310/12.04 310/12.19 310/12.22 310/12.24 310/12.31 310/12.32 310/152 318/135 82/1.11 82/1.110P 82/11.1 82/12 82/12S 82/157 82/158 82/158S 821/57



Family:

Publication number	Publication date	Application number	Application date
AU2003249653 AA	20031219	AU20030249653	20030529
US2004035266 AA	20040226	US20030448336	20030529
US2005056125 AA	20050317	US20040858482	20040601
US2005166726 AA	20050804	US20040940427	20040914
US2007247007 AA	20071025	US20070738071	20070420
US7275468 BB	20071002	US20030448336	20030529
US7437980 BB	20081021	US20040858482	20040601
US7574947 BB	20090818	US20040940427	20040914
US7765905 BB	20100803	US20070738071	20070420
WO03101666 A2	20031211	WO2003US16693	20030529
WO03101666 A3	20040408	WO2003US16693	20030529
WO05002788 A2	20050113	WO2004US16970	20040601
WO05002788 A3	20050414	WO2004US16970	20040601
WO08131214 A2	20081030	WO2008US60813	20080418
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Priority:

US20020383956P 20020529 US20030448336 20030529 US20040858482 20040601
 WO2003US16693 20030529 US20070738071 20070420 US20040940427 20040914

Probable Assignee: MASSACHUSETTS INST OF TECHNOLOGY

Assignee(s): (std): CUFF DAVID ; MASSACHUSETTS INST TECHNOLOGY ; MONTESANTI RICHARD C ; TRUMPER DAVID L ; TRUMPER DAVID ; UNIV CALIFORNIA

Assignee(s): THE REGENTS OF THE UNIVERSITY OF CALIFORNIA ; THE UNIV ; UNIV ; OF CALIFORNIA UNIV ; UNIV OF CALIFORNIA ; THE UNIV OF CALIFORNIA ; MASSACHUSETTS INSTITUTE OF TECHNOLOGY ; FOUNDATION NATIONAL SCIENCE ; LAWRENCE LIVERMORE NATIONAL SECURITY LLC ; MASSACHUSETTS INST ; MASSACHUSETTS INST OF TECHNOLOGY

Inventor(s): (std): CUFF DAVID ; MONTESANTI RICHARD C ; KIRTLEY JR JAMES L ; TRUMPER DAVID L ; TRUMPER DAVID

Inventor(s): MONTESANTI RICHARD ; RICHARD C MONTESANTI ; DAVID L TRUMPER

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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 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 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 PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

Legal status (INPADOC)

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Patent **Date recorded** **Event group** **Code** **Event** **Details**

AU2003249653 AA	20031219	LSPB	+	published / reissued	
AU2003249653 AA	20050407	LSLE	-MK6	APPLICATION LAPSED SECTION 142(2)(F)/REG. 8.3(3) - PCT APPLIC. NOT ENTERING NATIONAL PHASE	
US2004035266 AA	20040226	LSPB	+	published / reissued	
US2005056125 AA	20050317	LSPB	+	published / reissued	
US2005166726 AA	20050804	LSPB	+	published / reissued	
US2007247007 AA	20071025	LSPB	+	published / reissued	
US2007247007 AA	20070420	LSAS	AS	ASSIGNMENT	OWNER NAME : MASSACHUSETTS INSTITUTE OF TECHNOLOGY, MASSACHUSET DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:TRUMPER, DAVID; CUFF, DAVID; REEL/FRAME:019188/0767; SIGNING DATES FROM 20070412 TO 20070419
US2007247007 AA	20080930	LSAS	AS	ASSIGNMENT	OWNER NAME : FOUNDATION, NATIONAL SCIENCE, VIRGINIA DESCRIPTION : CONFIRMATORY LICENSE; ASSIGNOR:TECHNOLOGY, MASSACHUSETTS INSTITUTE OF; REEL/FRAME:021606/0891 EFFECTIVE DATE : 20080625
US7275468 BB	20071002	LSGT	+	granted / extensions (spc, cpc, pte)	
US7275468 BB	20031125	LSAS	AS	ASSIGNMENT	OWNER NAME : THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, CALIF DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:MONTESANTI, RICHARD C.; REEL/FRAME:014155/0120 EFFECTIVE DATE : 20031120
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US7275468 BB	20071024	LSAS	AS	ASSIGNMENT	OWNER NAME : LAWRENCE LIVERMORE NATIONAL SECURITY, LLC, CALIFOR DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:CALIFORNIA, THE REGENTS OF THE UNIVERSITY OF; REEL/FRAME:020013/0741 EFFECTIVE DATE : 20070924
US7275468 BB	20110404	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US7275468 BB	20151002	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US7275468 BB	20151102	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
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MAINTENANCE FEE					
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US7437980 BB	20120423	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US7437980 BB	20161021	LSLE	-LAPS	LAPSE FOR FAILURE TO PAY MAINTENANCE FEES	
US7437980 BB	20161121	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US7437980 BB	20161213	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20161021
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US7574947 BB	20070226	LSAS	AS	ASSIGNMENT	PARTYTYPE : OWNER OWNER : MASSACHUSETTS INSTITUTE OF TECHNOLOGY, MASSACHUSET OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNOR:TRUMPER, DAVID L.; REEL/FRAME:018933/0297 EFFECTIVE DATE : 20061012
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US7574947 BB	20100907	LSRE	CC	CERTIFICATE OF CORRECTION	
US7574947 BB	20130219	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
US7574947 BB	20170220	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 8
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					CUFF, DAVID; REEL/FRAME:019188/0767; SIGNING DATES FROM 20070412 TO 20070419
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US7765905 BB	20140203	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4
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WO03101666 A3	20060707	LSNE	NENP	NON-ENTRY INTO THE NATIONAL PHASE IN:	REF COUNTRY CODE : JP
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WO05002788 A2	20050113	LSPB	+	published / reissued	
WO08131214 A2	20081030	LSPB	+	published / reissued	
WO08131214 A3	20091021	LSNE	NENP	NON-ENTRY INTO THE NATIONAL PHASE IN:	REF COUNTRY CODE : DE
WO08131214 A3	20100526	LSNE	-122	EP: PCT APPLICATION NON-ENTRY IN EUROPEAN PHASE	REF DOCUMENT NUMBER : 08746262 COUNTRY OF REF DOCUMENT : EP KIND CODE OF REF DOCUMENT : A2

Title: METHODS FOR TESTING OPHTHALMIC LENSES

Abstract: Source: US2005179154A What has been developed is a method for testing ophthalmic plastic lenses and ophthalmic plastic lens-making processes for compliance with federal safety performance requirements. The method of the invention provides an easier, less costly, and more effective means for complying with these safety performance requirements than what current methods provide.

Classifications:

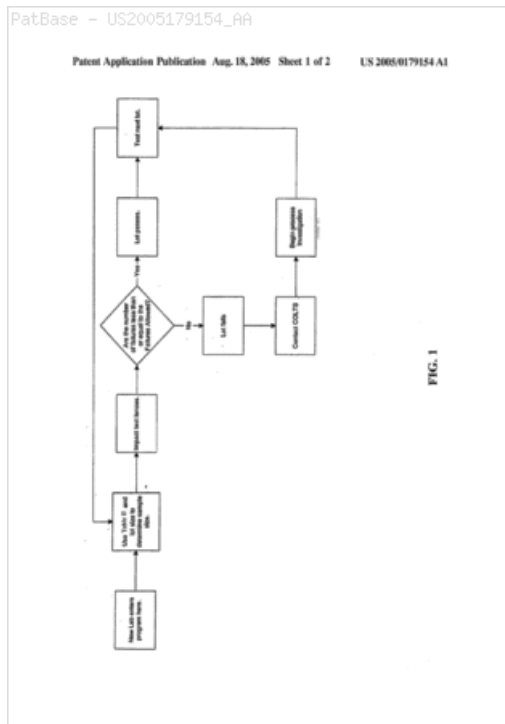
International (ipc 8-9): B29D11/00 G01N3/30 G01N3/303
G01N37/00 G06F17/18 G06F19/00 G06Q10/00 (Advanced/Invention);
G01N3/02 (Advanced/Non-invention);
B29D11/00 G01N3/30 G01N37/00 G06F17/18
G06F19/00 (Core/Invention);
G01N3/00 (Core/Non-invention)

International (ipc 1-7): B29D11/00

CPC: G01N3/303 G01N2203/0248

European: G01N3/303 S01N203/02E5 S01N3/02E5

US: 264/40.1 264/40.100P 702/179 702/179S 702/81 702/81P
702/84 705/7.38 705/7.41 73/12.01 73/12.010S



Family:

Publication number	Publication date	Application number	Application date
US2005179154 AA	20050818	US20050061266	20050217
US2009006017 AA	20090101	US20080166397	20080702
US7650250 BB	20100119	US20080166397	20080702
US8306853 BB	20121106	US20050061266	20050217

Priority:

US20040545067P 20040217 US20050061266 20050217 US20080166397 20080702

Probable Assignee: COLTS LABORATORIES

Assignee(s): (std): COLTS LAB ; NEELY DARYL ; YOUNG JOHN

Assignee(s): COLTS LABORATORIES

Inventor(s): (std): NEELY DARYL ; YOUNG JOHN

Agent(s): RUDEN MCCLOSKEY SMITH SCHUSTER AND RUSSELL PA; CUENOT FORSYTHE AND KIM LLC; STANLEY A

Legal status (INPADOC)

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Patent	Date recorded	Event group	Code	Event	Details
US2005179154 AA	20050818	LSPB	+	published / reissued	
US2005179154 AA	20050411	LSAS	AS	ASSIGNMENT	OWNER NAME : COLTS LABORATORIES, FLORIDA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:YOUNG, JOHN M.; NEELY, DARYL; REEL/FRAME:016457/0372 EFFECTIVE DATE : 20050223
US2009006017 AA	20090101	LSPB	+	published / reissued	
US7650250 BB	20100119	LSGT	+	granted / extensions (spc, cpc, pte)	
US7650250 BB	20080703	LSAS	AS	ASSIGNMENT	OWNER NAME : COLTS LABORATORIES, FLORIDA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:YOUNG, JOHN; NEELY, DARYL; REEL/FRAME:021195/0286

EFFECTIVE DATE : 20080702					
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US7650250 BB	20140217	LSLE	-PEX1	Patent Expired Due to NonPayment of Maintenance Fees Under 37 CFR 1.362	
US7650250 BB	20140311	LSLE	-FP	EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE	EFFECTIVE DATE : 20140119
US8306853 BB	20121106	LSGT	+	granted / extensions (spc, cpc, pte)	
US8306853 BB	20050411	LSAS	AS	ASSIGNMENT	OWNER NAME : COLTS LABORATORIES, FLORIDA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:YOUNG, JOHN M.; NEELY, DARYL; REEL/FRAME:016457/0372 EFFECTIVE DATE : 20050223
US8306853 BB	20121017	LSGT	PAT1	Patented Case	
US8306853 BB	20160118	LSFE	+FPAY	FEE PAYMENT	YEAR OF FEE PAYMENT : 4

Title: METHOD AND APPARATUS FOR COATING OPTICS

Abstract: Source: US2008286458A A system and method for coating lenses includes loading at least one lens into a spindle assembly, which transfers the lens into a coating station. The at least one lens may include a pair of lenses, which are simultaneously loaded into the spindle assembly for transfer into the coating station. The system may further include a washing and drying station and a curing station to receive lens assemblies before and after coating and the spindle assembly may include a plurality of spindle assemblies for sequential transfer of a plurality of lenses, or lens pairs, into and out from each station of the system.

Classifications:

International (IPC 8-9): B05C13/02 B05D5/06

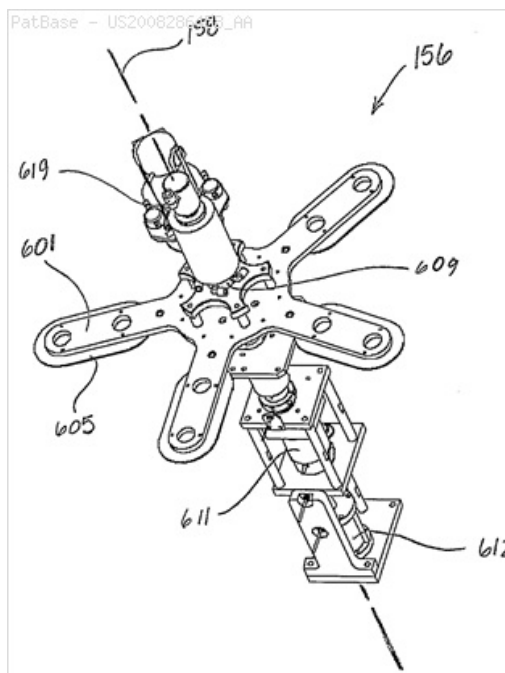
B29D11/00 (Advanced/Invention);

B05C13/02 B05D5/06 B29D11/00 (Core/Invention)

CPC: B29D11/0073 B29D11/00865

European: B29D11/00H B29D11/00K

US: 118/500 118/503 118/58 118/73 427/164

**Family:**

Publication number	Publication date	Application number	Application date
AT453504 E	20100115	AT20060737519T	20060308
DE602006011439 D1	20100211	DE200660011439T	20060308
EP1855873 A2	20071121	EP20060737519	20060308
EP1855873 B1	20091230	EP20060737519	20060308
US2008286458 AA	20081120	US20060908484	20060308
WO06099012 A2	20060921	WO2006US08353	20060308
WO06099012 A3	20070104	WO2006US08353	20060308

Priority:

US20050659946P 20050309 US20060908484 20060308 WO2006US08353 20060308

Probable Assignee: WALMAN OPTICAL CO

Assignee(s): (std): KIRCHOFF DAVID R ; WALMAN OPTICAL CO ; WALMAN OPTICAL COMPANY ; WALMAN OPTICAL COMPANY THE

Assignee(s): THE WALMAN OPTICAL CO ; THE WALMAN OPTICAL COMPANY

Inventor(s): (std): BOHO CHUCK ; CLYNE MIKE ; HOSTRAWSEY CARY ; KIRCHOFF DAVID ; KIRCHOFF DAVID R ; TSCHIDA MIKE

Agent(s): MOLNIA DAVID; INTELLECTUAL PROPERTY GROUP FREDRIKSON AND BYRON PA

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 KM KN KP KR KZ LC LI LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SM SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

Legal status (INPADOC)

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Patent	Date recorded	Event group	Code	Event	Details
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DE602006011439 D1	20110120	LSGT	+8364	NO OPPOSITION DURING TERM OF OPPOSITION	

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EP1855873 A2	20071121	LSES	+17P	REQUEST FOR EXAMINATION FILED	EFFECTIVE DATE : 20070911
EP1855873 A2	20081217	LSES	+17Q	FIRST EXAMINATION REPORT	EFFECTIVE DATE : 20081113
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EP1855873 A2	20091231	LSNP	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : EP
EP1855873 A2	20100120	LSGT	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : IE REF LEGAL EVENT CODE : FG4D
EP1855873 A2	20100430	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : CH PAYMENT DATE : 20100323 YEAR OF FEE PAYMENT : 05
EP1855873 A2	20100506	LSRV	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : NL REF LEGAL EVENT CODE : VDEP EFFECTIVE DATE : 20091230
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EP1855873 A2	20100531	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : LT DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME- LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20100531	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : LV DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME- LIMIT EFFECTIVE DATE : 20091230

EP1855873 A2	20100630	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : AT DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20100730	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : BG DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20100330
EP1855873 A2	20100730	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : EE DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20100730	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : ES DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20100410
EP1855873 A2	20100730	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : IS DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20100430
EP1855873 A2	20100730	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : NL DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20100730	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : PT DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20100430
EP1855873 A2	20100730	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : RO DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20100831	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : DE PAYMENT DATE : 20100318 YEAR OF FEE PAYMENT : 05
EP1855873 A2	20100930	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : SK DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20100930	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : CZ DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20100930	LSLE	-PG25	LAPSED IN A CONTRACTING	REF COUNTRY CODE : BE DESCRIPTION : LAPSE BECAUSE OF

EP1855873 A2	20101124	LSLE	-GBPC	STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE	FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20101208	LSGT	+26N	NO OPPOSITION FILED	EFFECTIVE DATE : 20101001
EP1855873 A2	20101224	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : FR REF LEGAL EVENT CODE : ST EFFECTIVE DATE : 20101130
EP1855873 A2	20101231	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : MC DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 20100331
EP1855873 A2	20101231	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : CY DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20101231	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : GR DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20100331
EP1855873 A2	20110131	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : DK DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20110131	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : FR DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 20100331
EP1855873 A2	20110131	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : IE DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 20100308
EP1855873 A2	20110331	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : GB DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 20100330
EP1855873 A2	20110331	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : IT DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20110531	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL	REF COUNTRY CODE : CH PAYMENT DATE : 20110314 YEAR OF FEE PAYMENT : 06

OFFICE					
EP1855873 A2	20110729	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : DE PAYMENT DATE : 20110302 YEAR OF FEE PAYMENT : 06
EP1855873 A2	20120430	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : CH PAYMENT DATE : 20120313 YEAR OF FEE PAYMENT : 07
EP1855873 A2	20120731	LSFE	+PGFP	POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE	REF COUNTRY CODE : DE PAYMENT DATE : 20120404 YEAR OF FEE PAYMENT : 07
EP1855873 A2	20120928	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : LU DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 20100308
EP1855873 A2	20120928	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : HU DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME- LIMIT EFFECTIVE DATE : 20100701
EP1855873 A2	20121031	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : TR DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME- LIMIT EFFECTIVE DATE : 20091230
EP1855873 A2	20131031	LSLE	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : CH REF LEGAL EVENT CODE : PL
EP1855873 A2	20140116	LSDW	REG	REFERENCE TO A NATIONAL CODE	REF COUNTRY CODE : DE REF LEGAL EVENT CODE : R119 REF DOCUMENT NUMBER : 602006011439 COUNTRY OF REF DOCUMENT : DE EFFECTIVE DATE : 20131001
EP1855873 A2	20140131	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : CH DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 20130331
EP1855873 A2	20140131	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : DE DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 20131001
EP1855873 A2	20140131	LSLE	-PG25	LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO	REF COUNTRY CODE : LI DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES EFFECTIVE DATE : 20130331
EP1855873 B1	20091230	LSGT	+	granted / extensions (spc, cpc, pte)	
US2008286458 AA	20081120	LSPB	+	published / reissued	
US2008286458 AA	20101015	LSAS	AS	ASSIGNMENT	OWNER NAME : THE WALMAN OPTICAL COMPANY, MINNESOTA DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:KIRCHOFF, DAVID R.; TSCHIDA, MIKE; HOSTRAWSER, CARY; AND OTHERS; SIGNING DATES FROM 20090908 TO 20090910;

US2008286458 AA	20121116	LSWD	-ABD3	Abandoned -- Failure to Respond to an Office Action	
WO06099012 A2	20060921	LSPB	+	published / reissued	
WO06099012 A3	20070911	LSNE	NENP	NON-ENTRY INTO THE NATIONAL PHASE IN:	REF COUNTRY CODE : DE
WO06099012 A3	20071009	LSNE	NENP	NON-ENTRY INTO THE NATIONAL PHASE IN:	REF COUNTRY CODE : RU
WO06099012 A3	20080723	LSNP	+WWE	WIPO INFORMATION: ENTRY INTO NATIONAL PHASE	REF DOCUMENT NUMBER : 11908484 COUNTRY OF REF DOCUMENT : US

Title: APPARATUS AND METHOD FOR FORMING THIN FILMS IN SOLAR CELLS

Abstract: Source: US2014131193A Apparatus for forming a solar cell comprises a housing defining a chamber including a substrate support. A sputtering source is configured to deposit particles of a first type over at least a portion of a surface of a substrate on the substrate support. An evaporation source is configured to deposit a plurality of particles of a second type over the portion of the surface of the substrate. A cooling unit is provided between the sputtering source and the evaporation source. A control system is provided for controlling the evaporation source based on a rate of mass flux emitted by the evaporation source.

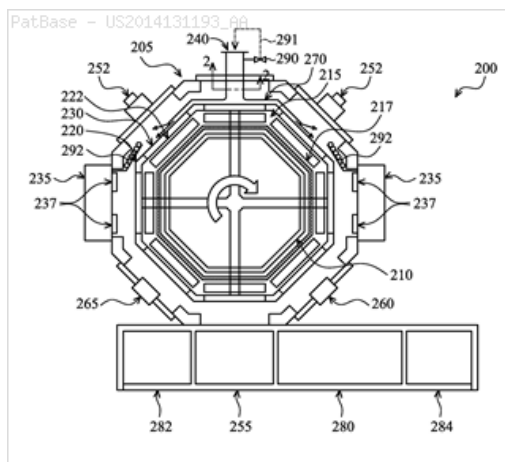
Classifications:

International (IPC 8-9): C23C14/00 C23C14/04 C23C14/06 C23C14/22 C23C14/24 C23C14/34 C23C14/50 C23C14/54

C23C14/56 C23C14/58 H01L31/18 (Advanced/Invention)

CPC: C23C14/54 C23C14/56 C23C14/541 C23C14/505 C23C14/24 C23C14/00 C23C14/34 C23C14/5806 C23C14/044 C23C14/3464 C23C14/564 C23C14/568

US: 1/1 204/192.1 204/298.03 204/298.07 204/298.09 204/298.15

**Family:**

Publication number	Publication date	Application number	Application date
CN103805942 A	20140521	CN201310035357	20130129
CN103805942 B	20161228	CN201310035357	20130129
TW201418493 A	20140516	TW20130138607	20131025
TWI546403 B	20160821	TW20130138607	20131025
US2014131193 AA	20140515	US20120672777	20121109
US9103032 BB	20150811	US20120672777	20121109

Priority:

US20120672777 20121109

Probable Assignee: TAIWAN SEMICONDUCTOR MFG CO LTD

Assignee(s): (std): TAIWAN SEMICONDUCTOR MFG CO LTD ; TSMC SOLAR LTD

Assignee(s): TAIWAN SEMICONDUCTOR MFG CO

Inventor(s): (std): CHAO YING CHEN ; CHIH JEN YANG ; EDWARD TENG ; TENG EDWARD ; YANG CHIH JEN ; YING CHEN CHAO

Agent(s): DUANE MORRIS LLP; STEVEN E

Legal status (INPADOC)

[View legal status timeline](#)

Patent	Date recorded	Event group	Code	Event	Details
CN103805942 A	20140521	LSPB	+	published / reissued	
CN103805942 A	20140521	LSPB	+C06	PUBLICATION	
CN103805942 A	20160810	LSAS	C41	TRANSFER OF PATENT APPLICATION OR PATENT RIGHT OR UTILITY MODEL	
CN103805942 A	20161228	LSGT	+C14	GRANT OF PATENT OR UTILITY MODEL	
CN103805942 B	20161228	LSGT	+	granted / extensions (spc, cpc, pte)	
TW201418493 A	20140516	LSPB	+	published / reissued	
TWI546403 B	20160821	LSGT	+	granted / extensions (spc, cpc, pte)	
US2014131193 AA	20140515	LSPB	+	published / reissued	
US2014131193 AA	20121109	LSAS	AS	ASSIGNMENT	OWNER NAME : TSMC SOLAR LTD., TAIWAN DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST; ASSIGNORS:TENG, EDWARD; CHAO,

YING-CHEN; YANG, CHIH-JEN;
REEL/FRAME:029268/0553
EFFECTIVE DATE : 20121108

US9103032 BB	20150811	LSGT	+	granted / extensions (spc, cpc, pte)
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US9103032 BB	20150722	LSGT	PAT1	Patented Case
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US9103032 BB	20160616	LSAS	AS	ASSIGNMENT	OWNER NAME : TAIWAN SEMICONDUCTOR MANUFACTURING CO., LTD., TAIW DESCRIPTION : MERGER; ASSIGNOR:TSMC SOLAR LTD.; REEL/FRAME:039050/0299 EFFECTIVE DATE : 20160118
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