PATENT ASSIGNMENT

Electronic Version v1.1
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SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	PATENT SECURITY AGREEMENT

CONVEYING PARTY DATA

Name	Execution Date
TESLA MOTORS, INC.	02/14/2008

RECEIVING PARTY DATA

Name:	ELON MUSK REVOCABLE TRUST DATED JULY 22, 2003, as Representative Secured Party
Street Address:	1105 Bel Air Place
City:	Los Angeles
State/Country:	CALIFORNIA
Postal Code:	90077

PROPERTY NUMBERS Total: 23

Property Type	Number
Application Number:	11129118
Application Number:	11353648
Application Number:	11414050
Application Number:	11444572
Application Number:	11452793
Application Number:	11489387
Application Number:	11488353
Application Number:	11591207
Application Number:	11731574
Application Number:	11729817
Application Number:	11786108
Application Number:	11799540
Application Number:	11818838
Application Number:	11779620

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Application Number:	11779583
Application Number:	11820660
Application Number:	11820008
Application Number:	11779829
Application Number:	11770834
Application Number:	11779837
Application Number:	11779840
Application Number:	11779843
Application Number:	60950600

CORRESPONDENCE DATA

Fax Number: (714)755-8290

Correspondence will be sent via US Mail when the fax attempt is unsuccessful.

Phone: 714-540-1235

Email: ipdocket@lw.com, kristin.azcona@lw.com

Correspondent Name: LATHAM & WATKINS LLP

Address Line 1: 650 Town Center Drive, 20th Floor

Address Line 4: Costa Mesa, CALIFORNIA 92626

ATTORNEY DOCKET NUMBER:	043482-0002
NAME OF SUBMITTER:	Kristin J. Azcona

Total Attachments: 11
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Tesla Motors, Inc.

PATENT SECURITY AGREEMENT

Patent Security Agreement, dated as of February 14, 2008 (as amended, amended and restated, supplemented or otherwise modified from time to time, this "Patent Security Agreement"), by Tesla Motors, Inc., a Delaware corporation (the "Pledgor"), in favor of Elon Musk Revocable Trust Dated July 22, 2003 (the "Representative Secured Party"),on behalf of the Secured Parties identified in that certain Security Agreement of even date herewith between Pledgor, Representative Secured Party and the other Secured Parties thereto (as amended, amended and restated, supplemented or otherwise modified from time to time, the "Security Agreement").

WITNESSETH:

WHEREAS, the Pledgor is party to the Security Agreement in favor of the Representative Secured Party pursuant to which the Pledgor is required to execute and deliver this Patent Security Agreement;

NOW, THEREFORE, in consideration of the premises and to induce the Secured Parties to enter into the Purchase Agreement (as defined in the Security Agreement), the Pledgor hereby agrees with the Representative Secured Party as follows:

SECTION 1. Defined Terms. Unless otherwise defined herein, terms defined in the Security Agreement and used herein have the meaning given to them in the Security Agreement.

SECTION 2. Grant of Security Interest in Patent Collateral. The Pledgor hereby pledges and grants to the Representative Secured Party for the benefit of the Secured Parties a lien on and security interest in and to all of its right, title and interest in, to and under all the following Collateral of the Pledgor:

(a) patents of the Pledgor listed on Schedule I attached hereto (the "Patents"); and

(b) all proceeds of any and all of the foregoing.

SECTION 3. Security Agreement. The security interest granted pursuant to this Patent Security Agreement is granted to the extent a security interest is granted to the Representative Secured Party pursuant to the Security Agreement and the Pledgor hereby acknowledges and affirms that the rights and remedies of each party with respect to the security interest in the Patents made and granted hereby are more fully set forth in the Security Agreement, the terms and provisions of which are incorporated by reference herein as if fully set forth herein. In the event that any provision of this Patent Security Agreement is deemed to conflict with the Security Agreement, the provisions of the Security Agreement shall control. Nothing in this Patent Security Agreement shall serve to limit, restrict, amplify or extend any rights of any party under the Security Agreement.

SECTION 4. Termination. Upon the payment in full of the Obligations and termination of the Security Agreement, the Representative Secured Party shall execute, acknowledge, and deliver to the Pledgor (or its successors or assigns) an instrument in writing in recordable form releasing the collateral pledge, grant, lien and security interest in the Patents under this Patent Security Agreement and take such other actions reasonably requested by the Pledgor (or its successors or assigns) to effect such release.

SECTION 5. Counterparts. This Patent Security Agreement may be executed in any number of counterparts, all of which shall constitute one and the same instrument, and any party hereto may execute this Patent Security Agreement by signing and delivering one or more counterparts.

[signature page follows]

IN WITNESS WHEREOF, the Pledgor has caused this Patent Security Agreement to be executed and delivered by its duly authorized officer as of the date first set forth above.

Very truly yours,

Tesla Motors, Inc.

By: ______________________________
Name: ZE'EV DRORI
Title: PRESIDENT, CEO.

Accepted and Agreed:

Elon Musk, as Trustee of the
ELON MUSK REVOCABLE TRUST DATED JULY 22, 2003,
as Representative Secured Party

By: ______________________________

IN WITNESS WHEREOF, the Pledgor has caused this Patent Security Agreement to be executed and delivered by its duly authorized officer as of the date first set forth above.

Very truly yours,

Tesla Motors, Inc.

By: ______________________________

Name:

Title:

Accepted and Agreed:

Elon Musk, as Trustee of the
ELON MUSK REVOCABLE TRUST DATED JULY 22, 2003,
as Representative Secured Party

By: ______________________________

SCHEDULE I
to
PATENT SECURITY AGREEMENT
PATENT REGISTRATIONS AND PATENT APPLICATIONS

Patent Portfolio Summary								
	Application Serial No.	**Publication Date**	**U.S. Filing Date**	**Title**	**Inventors**	**Short Description of Invention**	**System**	**International Filings**
1	11/129,118	11/12/2006	5/12/2005	Method and Apparatus for Mounting, Cooling, Connecting and Protecting Batteries	Straubel Berdichevsky Lyons Colson Eberhard Wright Ferber	A system and method mounts batteries in a substrate or insert to a substrate, electrically connects them via a set of conductors, and cools them using air, or cooling tubes having a flow of air or coolant running in opposite directions past each of the batteries.	ESS	Europe Japan India Canada
2	11/353,648	8/13/2007	2/13/2006	System and Method for Fusibly Linking Batteries	Straubel, Lyons Berdichevsky, Kohn, Teixeira	A system and method links batteries in parallel to conductors using wire bonds that act as fuses in the event of an overcurrent condition in a battery. To protect the wire bonds in the case of a larger overcurrent condition, a fuse may be added in series to the parallel batteries.	ESS	Thailand
3	11/414,050	10/27/2007	4/27/2006	System and Method for Interconnection of Battery Packs	West Berdichevsky Kohn	A system and method interconnects battery packs using a flexible bus bar to prevent vibration from breaking or damaging the connections therebetween.	ESS	Thailand
4	11/444,572	11/30/2007	5/31/2006	System and Method for Inhibiting the Propagation of an Exothermic Event	Straubel Lyons Berdichevsky Kohn Teixeira	A system and method disperses a sudden increase in heat generated by one battery cell to a large area including multiple battery cells, thereby preventing the sudden increase from being absorbed primarily by a small number of other battery cells, such as a single battery cell, that could otherwise cause the other battery cells to fail or release their own heat. The system and method also applies to other types of power storage devices, such as capacitors.	ESS	Taiwan Thailand
5	11/452,793	12/13/2007	6/13/2006	System and Method for an Efficient Rotor for and Electric Motor	Lyons Straubel Shahoian Garriga	A rotor assembly for an electric motor is constructed by adding bars made out of a conducting material such as copper, to spaces between the teeth of a stack of discs, inserting bars referred to as "slugs", also made out of a conducting material such as copper, in the spaces between the bars on either side of the stack of discs, radially compressing the bars and discs, one or both of which are plated or otherwise coated with a braising material, and then heating the rotor to allow the bars to be braised to the slugs.	Motor	Taiwan Thailand

6	11/489,387	1/18/2008	7/18/2006	System and Method for Opening Nearby Garage Doors	Tarpenning Eberhard	A system and method identifies its location and displays labels for buttons to open garage doors nearby, omitting button labels for more distant garage doors, enabling a garage door opener to operate more garage doors than there are buttons displayed. Some doors may be designated as automatic, and an open code is sent to such doors when a device capable of transmitting open codes is within a threshold distance of the door. Open codes to some automatic doors may only be provided if the device is additionally traveling or oriented in a direction specified for the door or nearly that direction.		
7	11/488,353	1/18/2008	7/18/2006	Method of Balancing Batteries	Renda	A methodology for balancing batteries for use in an electric vehicle. The methodology includes initializing a target balance voltage value to a predetermined voltage. Sampling a first voltage of the batteries at a predetermined interval. Sending the lowest voltage value to all of the batteries. Replacing the target value voltage with the lowest voltage if the lowest voltage is lower than the target balance voltage and bleeding the batteries if a sampled voltage is higher than the target balance voltage.	ESS	Thailand
8	11/591,207	4/30/2008	10/31/2006	System and Method for Adjusting the Time of A Clock to Match Time Zone at the Location of the Clock	Tarpenning Eberhard	A system and method updates a clock to display time according to the time zone in which the clock is running, but allows the user to set the time displayed, for example, by adding an offset to the correct time, even if the resulting time is not the correct time.		
9	11/731,574	9/20/2008	3/20/2007	Tunable Frangible Battery Pack Conductor	Kohn Berdichevsky Hewett	A tunable frangible battery pack system for use in an electric vehicle is disclosed. The tunable frangible battery pack system includes a two piece clamshell housing. The system also includes a plurality of battery cells arranged within the housing and a collector plate secured to each piece of the housing. The system also includes a wire conductor arranged between each of the battery cells and collector plates to create a frangible disconnect system when the battery pack system and electric vehicle are exposed to a predetermined mechanical or thermal force or event.	ESS	Taiwan Thailand
10	11/729,817	9/29/2008	3/29/2007	An Electro Mechanical Connector for Use in Electrical Applications	Frey Lu Lyons	An electro mechanical connector for use in an electrical vehicle having a battery pack is disclosed. The connector includes a locking collar having a slot therein and a plug body arranged within the locking collar. The connector also has a switch mount sleeve arranged on the plug body and a micro switch connected to the switch mount sleeve at a predetermined position. The electrical connector also includes a switch actuator that is slidingly arranged within the slot and is	Charger	

						aligned with the micro switch when the electrical mechanical connector is in its fully locked position.		
11	11/786,108	10/11/2008	4/11/2007	Electric Vehicle Thermal Management System	Zhou	An efficient thermal management system (100) that utilizes a single heat exchanger (133) is provided. A refrigeration subsystem (103) cools the heat exchanger (133). A first coolant loop (139) in thermal communication with the heat exchanger (133) is used to cool the energy storage system (137). A second coolant loop (151) corresponding to the HVAC subsystem (107) is also in thermal communication with the heat exchanger (133). Preferably a third coolant loop (109) corresponding to the drive motor cooling subsystem (101) is coupleable to the HVAC coolant loop (151), thus providing an efficient means of providing heat to the HVAC subsystem (107).	Motor	
12	11/799,540	11/1/2008	5/1/2007	Liquid Cooled Rotor Assembly	Kalayjian Cutler Augenbergs Zhou	A rotor assembly cooling system (100) and method of using same are provided. A portion of the rotor shaft (103) is hollow, the rotor shaft including an open end (107) and a closed end (105). A coolant feed tube (109) is rigidly attached to the rotor shaft (103) using one or more support members (111), thus causing the shaft and the feed tube to rotate at the same rate. Coolant is pumped through the feed tube until it exits the end of the feed tube and flows against the inside surface of the closed end of the rotor shaft causing the coolant to change direction and flow back through the coolant flow region, this region being defined as the space between the outer surface of the feed tube and the inner surface of the hollow rotor shaft.	Motor	
13	11/818,838	12/15/2008	6/15/2007	Electrical Vehicle Communication Interface	Berdichevsky Kelty Straubel Tarpenning Campbell	A method of communicating with an electric vehicle wherein the method includes a step of installing a communication device in the electric vehicle. The method also includes establishing a connection from the vehicle to a network. The methodology also includes controlling and monitoring a battery in the electric vehicle.	ESS	

14	11/779,620	1/18/2009	7/18/2007	Method of Deactivating Faulty Battery Cells	Berdichevsky	A method and apparatus for deactivating a bad battery cell from a battery pack for an energy storage system of an electric vehicle is disclosed. The apparatus and methodology includes a clamshell member arranged at an end of the cells and a printed circuit board arranged adjacent to the clamshell member. A collector plate is arranged adjacent to the printed circuit board and a switch is arranged on the printed circuit board. A wire bond is arranged between the switch and one of the cells and a second wire bond is arranged between the switch and the collector plate. The plurality of switches will allow for the identification of the one individual cell having a weak short circuit within the battery pack. Upon identification of the cell with the weak short circuit that cell will have its switch placed in an open position thus electrically isolating the faulty or bad cell from the battery pack.	ESS	
15	11/779,583	1/18/2009	7/18/2007	Battery Pack Thermal Management System	Adams Berdichevsky Colson Hebert Kohn Lyons Mendez Straubel West	A battery pack thermal management system for use in an electric car. The battery pack thermal management system includes a plurality of thermistors connected to a plurality of cells of a battery pack. A battery monitor board is connected to the thermistors. The system also includes a manifold and a plurality of cooling tubes connected to the manifold. A tube seal plug is arranged over an end of the cooling tube and an end fitting is arranged on an end of the cooling tube. The thermal management system will cool the battery pack to predetermined temperatures to increase the longevity of the battery pack within the electric vehicle.	ESS	
16	11/820,660	12/20/2008	6/20/2007	Early Detection of Battery Cell Thermal Events Using an Optical Pyrometer	Hermann	A battery module for use in an electric vehicle is disclosed. The battery module includes a plurality of cells arranged in a predetermined pattern within the module. The battery module also includes an optical pyrometer arranged inside the module. The optical pyrometer is installed within the module after being tuned to detect a predetermined frequency or band of frequencies. The pyrometer will be used to detect an increase in short wave radiation density from one of the battery cells within the module wherein that battery cell has a temperature above a predetermined threshold. The optical pyrometer will be used to communicate an electric signal to a control system of the electric vehicle wherein that control system will implement a predetermined mitigation process to contain the thermal event of that one cell within the battery module.	ESS	

17	11/820,660	12/18/2008	6/18/2007	Optimized Tube Geometry for Intimate Thermal Contact with Nested Cylindrical Surfaces	Hermann Kohn West Berdichevsky	A battery pack thermal management system for use in an electrical vehicle is disclosed. The battery pack thermal management system includes a manifold and a plurality of cells arranged in a predetermined pattern within the battery pack. The system also includes a cooling tube having a scallop like outer surface in thermal contact with the cells and in fluid communication with the manifold. The thermal management system will cool the battery pack to a predetermined temperature to increase the longevity of the battery pack within the electric vehicle.	ESS	
18	11/820,008	1/18/2009	7/18/2007	Mitigation of Propagation of Thermal Runaway in a Multi-Cell Battery Pack	Hebert Lyons Berdichevsky Straubel Kelty Tarpenning Kohn Cole	A method of mitigating propagation of a thermal event in an energy storage system having a plurality of cells is disclosed. The method includes the steps of identifying the heat sources within the energy storage system and plurality of cells. The method then controls a temperature of the energy storage system and plurality of cells and also detects predetermined conditions within the energy storage system. The method then performs a predetermined action based on when one of the predetermined conditions is detected. A plurality of sensors and switches along with associated hardware or software will be used to control the temperature of the energy storage system upon detection of predetermined conditions involving overheating, over current, over voltage of the like.	ESS	
22	11/779,829	1/18/2009	7/18/2007	Systems, Methods, and Apparatus for Battery Charging	Krauer Straubel Nergaard Craven Hebert	An apparatus including a rechargeable battery pack installed in an electric vehicle, the rechargeable battery pack coupled to a power supply, the power supply operable to provide a charge voltage to perform charging operations on the battery pack, a heating element to heat a fluid to be circulated through the rechargeable battery pack, a comparator circuit to compare a battery voltage of the rechargeable battery pack to a line source voltage, the comparator circuit operable to compare the battery voltage to the line source voltage and to provide an output signal when the battery voltage is less than a line voltage offset value, and a control circuit coupled to receive the output signal of the comparator, and to couple the line source voltage to the power supply, and to bypass the heating element if the comparator is not providing the output signal.	ESS Charger	
19	11/770,834	1/18/2009	7/18/2007	Method and Apparatus for Battery Potting	Villanueva Hewett Beecher West Kohn Berdichevsky	One embodiment includes a bottom clamshell and a top clamshell sandwiching a first battery and a second battery, with a fill port extending from a top surface of the top clamshell through to the bottom surface of the top clamshell and to a space between the first and second batteries. The embodiment includes	ESS	

						a protrusion coupled to the top clamshell proximate to the fill port and extending into the space, wherein the protrusion at least partially occludes a direct path through the fill port to the space.		
20	11/779,837	1/18/2009	7/18/2007	Battery Charging Based On Cost and Life	Kelty Berdichevsky	One embodiment includes a system that includes a battery, an electric vehicle, the battery coupled to the electric vehicle to propel the electric vehicle, and a charging circuit to charge the battery. The embodiment includes a charging cost circuit to estimate a charging cost rate and to turn on the charging circuit. The embodiment also includes a timer circuit to provide a time signal to the charging cost circuit. The embodiment is configured such that the charging cost circuit is to turn on the charging circuit during a first time period in which the charging cost rate is below a first threshold until the battery reaches a first energy stored level, and to turn on the charging circuit during a second time period in which the charging cost rate is above the first threshold.	ESS	
21	11/779,840	1/18/2009	7/18/2007	Charge State Indicator For An Electric Vehicle	Frey Eberhard Kohn Smith Lyons	One embodiment of the present subject matter includes a battery mounted to a vehicle, with a charge state circuit located in the electric vehicle and coupled to the battery, the charge state circuit configured to provide a charge state signal indicative of the charge state of the battery. The embodiment includes a charging coupler port located proximate to a user accessible exterior of the electrical vehicle and coupled to the battery, the charging coupler port to conduct charging energy to the battery and to provide a charger connection signal indicative of a connection to an external power source. The embodiment also includes a lighting circuit coupled to the charging coupler port and the charge state circuit to control the brightness and color of an illuminated indicator responsive to the charge state signal and the charger connection signal.	Charger	
23	11/779,843	1/18/2009	7/18/2007	Centralized Multi-Zone Cooling For Increased Battery Efficiency	Adams Lyons Luk Berdichevsky Straubel	A system for managing battery temperature is described. The system may include a cooling subsystem which may include a fluid. A cabin circulation subsystem may be coupled to the cooling subsystem and may utilize the fluid for cabin cooling. A separate battery circulation subsystem may also be coupled to the cooling subsystem so that it may additionally utilize the fluid for battery cooling. A control may be present in order to regulate movement of the fluid to the cabin circulation subsystem and/or to the	ESS HVAC	

						battery circulation subsystem.		
24	60/950,600	1/18/2009	7/18/2007	Method and Apparatus for an Electric Vehicle (Provisional)	Eberhard Tarpenning Straubel Lyons	One embodiment includes a vehicle that includes a battery to supply a flow of electrical energy, an electric motor arranged to propel the vehicle, a first control circuit coupled between the battery and the motor to control the flow of electrical energy to the motor; a first heat exchange loop thermally coupled with a heat exchanger and a heating element, the first heat exchange loop to circulate a first fluid to heat or cool a passenger cabin; a second heat exchange loop thermally coupled with the heat exchanger, the second heat exchange loop to circulate a second fluid to heat or cool the battery and a second control circuit to couple a charger to the battery and to perform charging operations on the battery using a voltage source powered from a line source.	EV	

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