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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/094,086	12/02/2013	Jian Zhou	256975-2

CONFIRMATION NO. 1896

131278
Meagher Emanuel Laks Goldberg & Liao, LLP
One Palmer Square
Suite 325
Princeton, NJ 08542

POWER OF ATTORNEY NOTICE

OC000000092323477

Date Mailed: 07/31/2025

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/15/2025.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/dtdinh/

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 1

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14/094,086	12/02/2013	Jian Zhou	256975-2

CONFIRMATION NO. 1896

27571
Ascenda Law Group, PC
2150 N First Street
Suite 420
San Jose, CA 95131

POA ACCEPTANCE LETTER

OC000000092323548

Date Mailed: 07/31/2025

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/15/2025.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/dtdinh/

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 2

TO: patents@ascendalaw.com,tarek.fahmi@ascendalaw.com
FROM: noreply@uspto.gov
CC: patentcenter_eofficeaction@uspto.gov
SUBJECT: USPTO: Patent Electronic System - Correspondence Notification for Customer Number 27571

Thu Jul 31 05:03:59 EDT 2025

Dear Patent Center Customer:

Correspondence Address:

Ascenda Law Group, PC
2150 N First Street
Suite 420
San Jose,CALIFORNIA,95131
UNITED STATES

This is a courtesy notification regarding the following USPTO patent application(s) associated with your Customer Number, 27571, that have new outgoing correspondence. This correspondence is now available for viewing in Patent Center.

The official date of notification of the outgoing correspondence will be indicated on the form (e.g., PTOL-90) accompanying the correspondence.

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The list of documents shown below are provided as a courtesy and is not part of the official file wrapper. The content of the images shown in the Image File Wrapper is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
14094086	N570	07/31/2025	256975-2
14094086	N570	07/31/2025	256975-2

To view your correspondence online, please sign in to Patent Center and then select Workbench/View correspondence. To update your email address(es), select Manage/Manage customer numbers.

If you have any questions, please contact the Patent Electronic Business Center (EBC) at ebc@uspto.gov or 866-217-9197 Monday – Friday, 6 a.m. to midnight ET.

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Sincerely,

The Patent Center Team

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	256975-2
	Application Number	14/094,086
Title of Invention	Electric Drive System and Energy Management Method	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	~~General Electric Company~~ EDISON INNOVATIONS, LLC		
Mailing Address Information For Applicant:			
Address 1	~~1 River Road~~ 812 W. McDermott Dr. #1106		
Address 2			
City	~~Schenectady~~ Allen	**State/Province**	~~NY~~ TX
Country US		Postal Code	~~12345~~ 75013
Phone Number	~~203-944-6745~~	Fax Number	~~203-944-6712~~
Email Address	~~gpo.mail@ge.com~~		

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	256975-2
	Application Number	14/094,086
Title of Invention	Electric Drive System and Energy Management Method	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Tarek N. Fahmi/			Date (YYYY-MM-DD)	2025-07-15
First Name	Tarek	Last Name	Fahmi	Registration Number	41402

Additional Signature may be generated within this form by selecting the Add button.

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
14/094,086	**07/15/2025 07:00:53 PM Z ET**	**256975-2**

Title of Invention

Electric Drive System and Energy Management Method

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	9800182
CONFIRMATION #	1896	FILED BY	SARAH ZIZZO
PATENT CENTER #	71385595	FILING DATE	12/02/2013
CUSTOMER #	131278	FIRST NAMED INVENTOR	Jian Zhou
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Tarek Fahmi

Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
Edison_Exe_POA.pdf	134	Power of Attorney	1351 KB
14094086_Statement_3-73c.pdf	3	Assignee showing of ownership per 37 CFR 3.73	120 KB
14094086_ADS_email.pdf	2	Application Data Sheet	166 KB

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Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
Edison_Exe_POA.pdf	70037A4FECD2A63822F4A656346D25696299CADFD63189BBD FE124E26BB75CEEB71D3AB5B008D49AAB79E187DD66B1BB

	FCBCDA44980A8741C98797B48E0C70E6
14094086_Statement_3-73c.pdf	A0D08A4463BBD97D1EF29B0CA634A4122C8581E727F412946EAD5616D8BE5FAB1B2857AF29B6B53DBFFC511946CFA51DD3B1022D877731A8E4C8E842557AABF6
14094086_ADS_email.pdf	97C89D37E533C54CAA6EB8B098D257831FB69C9CA22B200886D017C21EB748E118D6EE671640E8987160CBA2258E1B228022E41E446BEFBFBD697B36F95E973A

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

REVOCATION OF PREVIOUS POWERS OF ATTORNEY WITH NEW GENERAL POWER OF ATTORNEY TO PROSECUTE APPLICATIONS AND REEXAMINATION PROCEEDINGS BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby revoke all previous powers of attorney given in the application(s), reexamination proceeding(s) and/or patent(s) listed below and appoint:

	Practitioners associated with the Customer Number	27571	

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications and reexamination proceedings assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application(s), reexamination proceeding(s) and/or patent(s) listed below to the address associated with Customer Number 27571.

Assignee Name and Address:

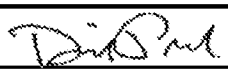
Edison Innovations, LLC
812 W. McDermott Dr. #1106
Allen, TX 75013

A statement under 37 CFR 3.73 is attached.

List of application(s), reexamination proceeding(s) and/or patent(s):

See attached list

SIGNATURE OF ASSIGNEE OF RECORD
The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date: 2/19/25
Name	David Pridham	Telephone: 214-414-1164
Title	CEO	

Annex A (Listed Patents)

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
124281-US-1	US	12/18/2003	US10/707496	US7262520	8/28/2007	Robust power distribution systems and methods	Dolby Intellectual Property Licensing, LLC	Active
133987-AU-3	AU	11/18/2004	AU2004295321A	AU2004295321	1/6/2011	Method and apparatus for producing tractive effort	Dolby Intellectual Property Licensing, LLC	Expired
133987-BR-4	BR	11/18/2004	BRPI0416414A	BRPI0416414	1/9/2007	Method and device for producing a tensile stress	Dolby Intellectual Property Licensing, LLC	Active
133987-CA-5	CA	11/18/2004	CA2545552A	CA2545552	7/9/2013	Method and apparatus for producing tractive effort	Dolby Intellectual Property Licensing, LLC	Expired
133987-CN-6	CN	11/18/2004	CN200480034845A	CN1886282	1/11/2012	Method and apparatus for producing traction effort	Dolby Intellectual Property Licensing, LLC	Expired
133987-DE-13	DE	11/18/2004	EP04811389A	EP1697158	10/17/2007	Method and apparatus for producing tracitive effort	Dolby Intellectual Property Licensing, LLC	Expired
133987-FR-12	FR	11/18/2004	EP04811389A	EP1697158	10/17/2007	Method and apparatus for producing tracitive effort	Dolby Intellectual Property Licensing, LLC	Expired
133987-IN-8	IN	5/11/2006	IN2659DEN2006A	IN301119	9/21/2018	Method and apparatus for producing tractive effort	Dolby Intellectual Property Licensing, LLC	Expired
133987-IT-14	IT	11/18/2004	EP04811389A	EP1697158	10/17/2007	Method and apparatus for producing tracitive effort	Dolby Intellectual Property Licensing, LLC	Expired
133987-MX-9	MX	11/18/2004	MXPA06005959A	MXPA06005959	7/6/2006	Method and apparatus for producing tractive effort.	Dolby Intellectual Property Licensing, LLC	Expired
133987-RU-10	RU	11/18/2004	RU2006122531A	RU2348546	3/10/2009	Traction method and mechanism	Dolby Intellectual Property Licensing, LLC	Expired
133987-US-1	US	11/25/2003	US10/723572	US7489093	2/10/2009	Method and apparatus for producing tractive effort	Dolby Intellectual Property Licensing, LLC	Active
133987-ZA-11	ZA	6/9/2006	ZA200604790A	ZA200604790	10/31/2007	Method and apparatus for producing tractive effort	Dolby Intellectual Property Licensing, LLC	Expired
134730-JP-2	JP	3/29/2005	JP2005093545A	JP4871520	2/8/2012	High density connection between multiple circuit boards	Dolby Intellectual Property Licensing, LLC	Active
145823-BR-3	BR	11/9/2005	BRPI0504935A	BRPI0504935	2/27/2018	â€œelectric ignition generating system"	Dolby Intellectual Property Licensing, LLC	Active
145823-DE-8	DE	11/10/2005	EP05256964A	EP1657807	6/5/2019	Bidirectional buck-boost power converter	Dolby Intellectual Property Licensing, LLC	Active
145823-EP-2	EP	11/10/2005	EP05256964A	EP1657807	6/5/2019	Bidirectional buck-boost power converter	Dolby Intellectual Property Licensing, LLC	Active
145823-JP-5	JP	11/1/2005	JP2005318000A	JP4870968	2/8/2012	Bidirectional buck-boost power converter, electric starter generator using bidirectional buck-boost power converter, and methods thereof	Dolby Intellectual Property Licensing, LLC	Active
145823-US-6	US	12/4/2007	US11/949963	US8138694	3/20/2012	Bidirectional buck-boost power converters	Dolby Intellectual Property Licensing, LLC	Active
146125-DE-5	DE	8/25/2005	EP05792879A	EP1784444	8/13/2014	Crosslinkable and crosslinked polymers	Dolby Intellectual Property Licensing, LLC	Active

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
146125-GB-6	GB	8/25/2005	EP05792879A	EP1784444	8/13/2014	Crosslinkable and crosslinked polymers	Dolby Intellectual Property Licensing, LLC	Active
146125-JP-4	JP	8/25/2005	JP2007530158A	JP5341349	11/13/2013	Crosslinkable and cross-linked polymers	Dolby Intellectual Property Licensing, LLC	Active
146125-NL-7	NL	8/25/2005	EP05792879A	EP1784444	8/13/2014	Crosslinkable and crosslinked polymers	Dolby Intellectual Property Licensing, LLC	Active
146125-US-1	US	8/27/2004	US10/928939	US7390857	6/24/2008	Crosslinkable and crosslinked polymers	Dolby Intellectual Property Licensing, LLC	Active
152861-CN-2	CN	9/13/2005	CN200510104181A	CN100565938	12/2/2009	Photovoltaic modules for solar concentrator	Dolby Intellectual Property Licensing, LLC	Active
152861-IT-4	IT	9/12/2005	ITMI20051676A	ITMI20051676	3/14/2006		Dolby Intellectual Property Licensing, LLC	Active
152861-US-1	US	9/13/2004	US10/939925	US7442871	10/28/2008	Photovoltaic modules for solar concentrator	Dolby Intellectual Property Licensing, LLC	Active
154645-US-1	US	11/24/2004	US10/996714	US7240353	7/3/2007	Functionality recommendation system	Dolby Intellectual Property Licensing, LLC	Active
155850-US-1	US	6/6/2005	US11/146875	US8039731	10/18/2011	Photovoltaic concentrator for solar energy system	Dolby Intellectual Property Licensing, LLC	Active
162163-US-1	US	12/15/2005	US11/303157	US7663456	2/16/2010	Micro-electromechanical system (mems) switch arrays	Dolby Intellectual Property Licensing, LLC	Active
162191-FR-7	FR	6/19/2007	EP07110554A	EP2017870	5/15/2013	Micro-electromechanical system based soft switching	Dolby Intellectual Property Licensing, LLC	Active
162191-JP-4	JP	6/12/2007	JP2007154931A	JP5149550	2/20/2013	Soft switching based on microelectromechanical systems	Dolby Intellectual Property Licensing, LLC	Active
162191-US-1	US	12/20/2005	US11/314879	US7633725	12/15/2009	Micro-electromechanical system based soft switching	Dolby Intellectual Property Licensing, LLC	Active
162667-CN-3	CN	12/20/2006	CN200680050737A	CN101356071	1/2/2013	Hybrid vehicle and method of assembling same	Dolby Intellectual Property Licensing, LLC	Active
162667-IN-5	IN	6/25/2008	IN5533DEN2008A	IN285074	7/14/2017	Hybrid vehicle and method of assembling same	Dolby Intellectual Property Licensing, LLC	Active
162667-US-1	US	1/9/2006	US11/328051	US7780562	8/24/2010	Hybrid vehicle and method of assembling same	Dolby Intellectual Property Licensing, LLC	Active
162711-US-2	US	11/28/2006	US11/563726	US7876538	1/25/2011	Micro-electromechanical system based arc-less switching with circuitry for absorbing electrical energy during a fault condition	Dolby Intellectual Property Licensing, LLC	Active
163124-US-1	US	11/22/2005	US11/285122	US7453195	11/18/2008	White lamps with enhanced color contrast	Joint ownership - Dolby Intellectual Property Licensing, LLC with Current and Savant	Active
164314-US-1	US	10/19/2005	US11/254096	US8022416	9/20/2011	Functional blocks for assembly	Dolby Intellectual Property Licensing, LLC	Active
164314-US-3	US	10/19/2005	US11/254181	US7926176	4/19/2011	Methods for magnetically directed self assembly	Dolby Intellectual Property Licensing, LLC	Active
164415-US-4	US	4/10/2006	US11/401043	US8121192	2/21/2012	Method and system for treating noise in a generated image	Dolby Intellectual Property Licensing, LLC	Active
164467-US-2	US	11/18/2005	US11/283451	US7521732	4/21/2009	Vertical heterostructure field effect transistor and associated method	Dolby Intellectual Property Licensing, LLC	Active
176303-CN-3	CN	12/15/2006	CN200680050746A	CN101356707	7/11/2012	Energy storage system for electric or hybrid vehicle	Dolby Intellectual Property Licensing, LLC	Active

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
176303-DE-8	DE	12/15/2006	EP06847706A	EP1977495	11/24/2010	Energy storage system for electric or hybrid vehicle	Dolby Intellectual Property Licensing, LLC	Active
176303-FR-7	FR	12/15/2006	EP06847706A	EP1977495	11/24/2010	Energy storage system for electric or hybrid vehicle	Dolby Intellectual Property Licensing, LLC	Active
176303-GB-9	GB	12/15/2006	EP06847706A	EP1977495	11/24/2010	Energy storage system for electric or hybrid vehicle	Dolby Intellectual Property Licensing, LLC	Active
176303-IN-5	IN	6/24/2008	IN5468DEN2008A	IN313530	6/7/2019	Energy storage system for electric or hybrid vehicle	Dolby Intellectual Property Licensing, LLC	Active
176303-JP-11	JP	5/11/2012	JP2012108971A	JP5703258	4/15/2015	Energy storage system for electric or hybrid vehicles	Dolby Intellectual Property Licensing, LLC	Active
176303-JP-14	JP	3/16/2017	JP2017050687A	JP6462027	1/30/2019	Energy storage system for electric or hybrid vehicles	Dolby Intellectual Property Licensing, LLC	Active
176303-JP-6	JP	12/15/2006	JP2008549486A	JP5525731	6/18/2014	Energy storage system for electric or hybrid vehicles	Dolby Intellectual Property Licensing, LLC	Active
176303-US-10	US	2/10/2011	US13/025102	USRE43956	2/5/2013	Energy storage system for electric or hybrid vehicle	Dolby Intellectual Property Licensing, LLC	Active
176303-US-12	US	11/20/2012	US13/681686	USRE45431	3/24/2015	Energy storage system for electric or hybrid vehicle	Dolby Intellectual Property Licensing, LLC	Active
176918-US-2	US	3/15/2006	US11/376545	US7388695	6/17/2008	Data storage devices and methods	Dolby Intellectual Property Licensing, LLC	Active
176918-US-4	US	9/18/2007	US11/901725	US8808944	8/19/2014	Method for storing holographic data	Dolby Intellectual Property Licensing, LLC	Active
176918-US-5	US	6/17/2008	US12/140807	US8842351	9/23/2014	Data storage method and device	Dolby Intellectual Property Licensing, LLC	Active
177675-US-1	US	11/30/2005	US11/290951	US7750641	7/6/2010	Battery system and method for monitoring a battery	Dolby Intellectual Property Licensing, LLC	Active
177675-US-2	US	5/17/2010	US12/781495	US7847558	12/7/2010	Battery system for monitoring a battery	Dolby Intellectual Property Licensing, LLC	Active
181455-US-1	US	5/16/2007	US11/749174	US7626801	12/1/2009	Integrated inductor and capacitor components and methods of manufacture	Dolby Intellectual Property Licensing, LLC	Active
182854-US-1	US	4/4/2005	US11/097294	US7492810	2/17/2009	Method and apparatus for segmented code correlation	Dolby Intellectual Property Licensing, LLC	Active
183176-DE-8	DE	12/19/2007	EP07867811A	EP2095252	11/13/2019	Piggyback networks	Dolby Intellectual Property Licensing, LLC	Active
183176-EP-4	EP	12/19/2007	EP07867811A	EP2095252	11/13/2019	Piggyback networks	Dolby Intellectual Property Licensing, LLC	Active
183176-FR-7	FR	12/19/2007	EP07867811A	EP2095252	11/13/2019	Piggyback networks	Dolby Intellectual Property Licensing, LLC	Active
183176-GB-9	GB	12/19/2007	EP07867811A	EP2095252	11/13/2019	Piggyback networks	Dolby Intellectual Property Licensing, LLC	Active
183752-US-1	US	11/11/2005	US11/271711	US7734099	6/8/2010	Method and system for generating polygonal boundary definitions for image objects	Dolby Intellectual Property Licensing, LLC	Active
187674-AU-3	AU	5/26/2008	AU2008202309A	AU2008202309	11/20/2014	Method and apparatus for assembling photovoltaic modules	Dolby Intellectual Property Licensing, LLC	Active
187674-CN-4	CN	5/26/2008	CN200810108828A	CN101320759	12/26/2012	Method and apparatus for assembling photovoltaic modules	Dolby Intellectual Property Licensing, LLC	Active
187674-DE-8	DE	5/21/2008	EP08156634A	EP1995791	7/22/2015	Method and apparatus for assembling photovoltaic modules	Dolby Intellectual Property Licensing, LLC	Active

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
187674-ES-6	ES	5/21/2008	EP08156634A	EP1995791	7/22/2015	Method and apparatus for assembling photovoltaic modules	Dolby Intellectual Property Licensing, LLC	Active
187674-IT-7	IT	5/21/2008	EP08156634A	EP1995791	7/22/2015	Method and apparatus for assembling photovoltaic modules	Dolby Intellectual Property Licensing, LLC	Active
187674-US-2	US	5/9/2008	US12/151806	US8701360	4/22/2014	Method and apparatus for assembling photovoltaic modules	Dolby Intellectual Property Licensing, LLC	Active
189292-CN-3	CN	1/5/2007	CN200780002160A	CN101370685	12/28/2011	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
189292-DE-8	DE	1/5/2007	EP07709593A	EP1976721	6/12/2019	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
189292-EP-4	EP	1/5/2007	EP07709593A	EP1976721	6/12/2019	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
189292-JP-6	JP	1/5/2007	JP2008549590A	JP5079709	11/21/2012	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
189292-US-1	US	1/9/2006	US11/328000	US7568537	8/4/2009	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
193892-US-1	US	9/28/2007	US11/863722	US7898176	3/1/2011	Fluidic thermal management article and method	Dolby Intellectual Property Licensing, LLC	Active
193892-US-2	US	9/28/2007	US11/863709	US8058802	11/15/2011	Thermal management article and method	Dolby Intellectual Property Licensing, LLC	Active
193892-US-3	US	9/28/2007	US11/863690	US7742673	6/22/2010	Thermal mangement article having thermal wave guide	Dolby Intellectual Property Licensing, LLC	Active
195378-US-2	US	6/22/2007	US11/767067	US7906092	3/15/2011	Methods for preparing compositions which comprise magnesium borohydride, and related materials	Dolby Intellectual Property Licensing, LLC	Active
197732-CA-4	CA	1/18/2007	CA2574470A	CA2574470	5/13/2014	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
197732-CN-5	CN	1/18/2007	CN200710086047A	CN101003259	10/12/2011	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
197732-DE-12	DE	1/18/2007	EP07100757A	EP1810861	8/11/2010	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
197732-FR-11	FR	1/18/2007	EP07100757A	EP1810861	8/11/2010	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
197732-GB-13	GB	1/18/2007	EP07100757A	EP1810861	8/11/2010	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
197732-IN-7	IN	1/18/2007	IN116DE2007A	IN284145	6/16/2017	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
197732-IT-14	IT	1/18/2007	EP07100757A	EP1810861	8/11/2010	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
197732-JP-15	JP	11/19/2012	JP2012252813A	JP5619115	11/5/2014	Wheel propulsion system	Dolby Intellectual Property Licensing, LLC	Active
197732-JP-8	JP	1/18/2007	JP2007008873A	JP5346437	11/20/2013	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
197732-US-2	US	12/21/2006	US11/614412	US7595597	9/29/2009	Vehicle propulsion system	Dolby Intellectual Property Licensing, LLC	Active
198520-US-1	US	10/6/2006	US11/539330	US7632425	12/15/2009	Composition and associated method	Dolby Intellectual Property Licensing, LLC	Active
205275-US-1	US	12/23/2008	US12/343288	US9093082	7/28/2015	Data storage devices and methods	Dolby Intellectual Property Licensing, LLC	Active

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205374-CN-2	CN	11/28/2007	CN200710305186A	CN101226835	2/22/2012	Micro-electromechanical system based switching module serially stackable with other such modules to meet a voltage rating	Dolby Intellectual Property Licensing, LLC	Active
205374-DE-8	DE	11/26/2007	EP07121542A	EP1928006	1/20/2010	Micro-electromechanical system based switching module serially stackable with other such modules to meet a voltage rating	Dolby Intellectual Property Licensing, LLC	Active
205374-FR-7	FR	11/26/2007	EP07121542A	EP1928006	1/20/2010	Micro-electromechanical system based switching module serially stackable with other such modules to meet a voltage rating	Dolby Intellectual Property Licensing, LLC	Active
205374-GB-9	GB	11/26/2007	EP07121542A	EP1928006	1/20/2010	Micro-electromechanical system based switching module serially stackable with other such modules to meet a voltage rating	Dolby Intellectual Property Licensing, LLC	Active
205374-JP-4	JP	11/27/2007	JP2007305386A	JP5421529	2/19/2014	Switching module based on micro-electromechanical system that can be stacked in series with its other module to satisfy voltage rating	Dolby Intellectual Property Licensing, LLC	Active
205374-KR-5	KR	11/27/2007	KR20070121507A	KR101388747	4/25/2014	Micro-electromechanical system based switching module serially stackable with other such modules to meet a voltage rating	Dolby Intellectual Property Licensing, LLC	Active
205374-MX-6	MX	11/27/2007	MX2007014966A	MX2007014966	2/19/2009	Micro-electromechanical system based switching module serially stackable with other such modules to meet a voltage rating.	Dolby Intellectual Property Licensing, LLC	Active
205374-US-1	US	11/28/2006	US11/563774	US7332835	2/19/2008	Micro-electromechanical system based switching module serially stackable with other such modules to meet a voltage rating	Dolby Intellectual Property Licensing, LLC	Active
205555-US-1	US	8/25/2006	US11/509397	US7313965	1/1/2008	High-temperature pressure sensor	Dolby Intellectual Property Licensing, LLC	Active
205932-US-1	US	12/23/2008	US12/343296	US8084168	12/27/2011	Holographic storage devices with complementary data layer and use thereof	Dolby Intellectual Property Licensing, LLC	Active
205979-AT-13	AT	8/5/2008	EP08161865A	EP2151362	10/10/2012	Method of operating a vehicle and associated system	Dolby Intellectual Property Licensing, LLC	Active
205979-CA-18	CA	8/1/2008	CA2901866A	CA2901866	11/7/2017	Method of operating vehicle and associated system	Dolby Intellectual Property Licensing, LLC	Active
205979-CA-2	CA	8/1/2008	CA2638479A	CA2638479	11/24/2015	Method of operating vehicle and associated system	Dolby Intellectual Property Licensing, LLC	Active
205979-DK-16	DK	8/5/2008	EP08161865A	EP2151362	10/10/2012	Method of operating a vehicle and associated system	Dolby Intellectual Property Licensing, LLC	Active
205979-ES-12	ES	8/5/2008	EP08161865A	EP2151362	10/10/2012	Method of operating a vehicle and associated system	Dolby Intellectual Property Licensing, LLC	Active
205979-FR-11	FR	8/5/2008	EP08161865A	EP2151362	10/10/2012	Method of operating a vehicle and associated system	Dolby Intellectual Property Licensing, LLC	Active
205979-NL-10	NL	8/5/2008	EP08161865A	EP2151362	10/10/2012	Method of operating a vehicle and associated system	Dolby Intellectual Property Licensing, LLC	Active
205979-US-17	US	3/25/2014	US14/224992	US9248825	2/2/2016	Method of operating vehicle and associated system	Dolby Intellectual Property Licensing, LLC	Active
207792-DE-13	DE	9/16/2008	EP08164432A	EP2045823	8/16/2017	System with circuitry for suppressing arc formation in micro-electromechanical system based switch	Dolby Intellectual Property Licensing, LLC	Active
207792-FR-14	FR	9/16/2008	EP08164432A	EP2045823	8/16/2017	System with circuitry for suppressing arc formation in micro-electromechanical system based switch	Dolby Intellectual Property Licensing, LLC	Active

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207792-GB-15	GB	9/16/2008	EP08164432A	EP2045823	8/16/2017	System with circuitry for suppressing arc formation in micro-electromechanical system based switch	Dolby Intellectual Property Licensing, LLC	Active
207792-IT-16	IT	9/16/2008	EP08164432A	EP2045823	8/16/2017	System with circuitry for suppressing arc formation in micro-electromechanical system based switch	Dolby Intellectual Property Licensing, LLC	Active
207792-JP-11	JP	7/25/2008	JP2008191824A	JP5340663	11/13/2013	System with circuitry for suppressing arc formation in microelectromechanical system based switches	Dolby Intellectual Property Licensing, LLC	Active
207792-KR-12	KR	10/2/2008	KR20080097287A	KR101468743	12/10/2014	System with circuitry for suppressing arc formation in micro-electromechanical system based switch	Dolby Intellectual Property Licensing, LLC	Active
207792-US-2	US	10/3/2007	US11/866849	US9076607	7/7/2015	System with circuitry for suppressing arc formation in micro-electromechanical system based switch	Dolby Intellectual Property Licensing, LLC	Active
208273-US-1	US	12/23/2008	US12/343289	US8182966	5/22/2012	Data storage devices and methods	Dolby Intellectual Property Licensing, LLC	Active
214912-US-1	US	12/6/2006	US11/634592	US8236200	8/7/2012	Nano-composite ir window and method for making same	Dolby Intellectual Property Licensing, LLC	Active
215038-DE-7	DE	11/26/2007	EP07121476A	EP1930922	8/9/2017	Electromechanical switching circuitry in parallel with solid state switching circuitry selectively switchable to carry a load current appropriate to such circuitry	Dolby Intellectual Property Licensing, LLC	Active
215038-FR-8	FR	11/26/2007	EP07121476A	EP1930922	8/9/2017	Electromechanical switching circuitry in parallel with solid state switching circuitry selectively switchable to carry a load current appropriate to such circuitry	Dolby Intellectual Property Licensing, LLC	Active
215038-GB-9	GB	11/26/2007	EP07121476A	EP1930922	8/9/2017	Electromechanical switching circuitry in parallel with solid state switching circuitry selectively switchable to carry a load current appropriate to such circuitry	Dolby Intellectual Property Licensing, LLC	Active
215038-IT-10	IT	11/26/2007	EP07121476A	EP1930922	8/9/2017	Electromechanical switching circuitry in parallel with solid state switching circuitry selectively switchable to carry a load current appropriate to such circuitry	Dolby Intellectual Property Licensing, LLC	Active
215038-JP-4	JP	12/4/2007	JP2007312956A	JP5215648	6/19/2013	Electromechanical switching circuit in parallel with a solid-state switching circuit that can be selectively switched to transmit a load current suitable for the circuit	Dolby Intellectual Property Licensing, LLC	Active
215038-KR-5	KR	12/5/2007	KR20070125518A	KR101409119	6/17/2014	Electromechanical switching circuitry in parallel with solid state switching circuitry selectively switchable to carry a load current appropriate to such circuitry	Dolby Intellectual Property Licensing, LLC	Active
215038-MX-6	MX	11/21/2007	MX2007014563A	MX2007014563	2/19/2009	Electromechanical switching circuitry in parallel with solid state switching circuitry selectively switchable to carry a load current appropriate to such circuitry.	Dolby Intellectual Property Licensing, LLC	Active
215038-US-1	US	12/6/2006	US11/567296	US7643256	1/5/2010	Electromechanical switching circuitry in parallel with solid state switching circuitry selectively switchable to carry a load appropriate to such circuitry	Dolby Intellectual Property Licensing, LLC	Active
215502-US-1	US	7/31/2008	US12/183488	US7829652	11/9/2010	Polyarylether composition and membrane	Dolby Intellectual Property Licensing, LLC	Active

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215575-DE-8	DE	1/10/2008	EP08100318A	EP1944785	11/14/2018	Gating voltage control system and method for electrostatically actuating a micro-electromechanical device	Dolby Intellectual Property Licensing, LLC	Active
215575-EP-3	EP	1/10/2008	EP08100318A	EP1944785	11/14/2018	Gating voltage control system and method for electrostatically actuating a micro-electromechanical device	Dolby Intellectual Property Licensing, LLC	Active
215575-FR-7	FR	1/10/2008	EP08100318A	EP1944785	11/14/2018	Gating voltage control system and method for electrostatically actuating a micro-electromechanical device	Dolby Intellectual Property Licensing, LLC	Active
215575-GB-10	GB	1/10/2008	EP08100318A	EP1944785	11/14/2018	Gating voltage control system and method for electrostatically actuating a micro-electromechanical device	Dolby Intellectual Property Licensing, LLC	Active
215575-IT-9	IT	1/10/2008	EP08100318A	EP1944785	11/14/2018	Gating voltage control system and method for electrostatically actuating a micro-electromechanical device	Dolby Intellectual Property Licensing, LLC	Active
215575-JP-4	JP	1/10/2008	JP2008002778A	JP5172360	3/27/2013	Gate voltage control system and method for electrostatic actuation of microelectromechanical devices	Dolby Intellectual Property Licensing, LLC	Active
215575-KR-5	KR	1/10/2008	KR20080003059A	KR101442250	9/23/2014	Gating voltage control system and method for electrostatically actuating a micro-electromechanical device	Dolby Intellectual Property Licensing, LLC	Active
215575-US-1	US	1/12/2007	US11/622483	US7473859	1/6/2009	Gating voltage control system and method for electrostatically actuating a micro-electromechanical device	Dolby Intellectual Property Licensing, LLC	Active
216634-US-1	US	2/13/2007	US11/705860	US7648649	1/19/2010	Red line emitting phosphors for use in led applications	Dolby Intellectual Property Licensing, LLC	Active
217591-US-1	US	6/28/2007	US11/769913	US7978402	7/12/2011	Robust window for infrared energy	Dolby Intellectual Property Licensing, LLC	Active
218806-US-1	US	9/4/2008	US12/204013	US8207813	6/26/2012	Electronic device and method	Dolby Intellectual Property Licensing, LLC	Active
219867-CN-8	CN	8/27/2009	CN200980100173A	CN101828285	4/3/2013	Composition, energy storage device, and method	Dolby Intellectual Property Licensing, LLC	Active
219867-US-2	US	12/9/2008	US12/330714	US8304110	11/6/2012	Composition and energy storage device	Dolby Intellectual Property Licensing, LLC	Active
219868-US-3	US	6/28/2007	US11/769752	US7632604	12/15/2009	Energy storage device and method	Dolby Intellectual Property Licensing, LLC	Active
219869-AU-3	AU	5/7/2008	AU2008266715A	AU2008266715	1/17/2013	Energy storage device and cell configuration therefor	Dolby Intellectual Property Licensing, LLC	Active
219869-CN-4	CN	5/7/2008	CN200880015037A	CN101682015	3/27/2013	Energy storage device and cell configuration therefor	Dolby Intellectual Property Licensing, LLC	Active
219869-DE-9	DE	5/7/2008	EP08747755A	EP2162934	1/6/2021	Energy storage device and cell configuration therefor	Dolby Intellectual Property Licensing, LLC	Active
219869-EP-5	EP	5/7/2008	EP08747755A	EP2162934	1/6/2021	Energy storage device and cell configuration therefor	Dolby Intellectual Property Licensing, LLC	Active
219869-FR-8	FR	5/7/2008	EP08747755A	EP2162934	1/6/2021	Energy storage device and cell configuration therefor	Dolby Intellectual Property Licensing, LLC	Active
219869-GB-10	GB	5/7/2008	EP08747755A	EP2162934	1/6/2021	Energy storage device and cell configuration therefor	Dolby Intellectual Property Licensing, LLC	Active

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219869-JP-6	JP	5/7/2008	JP2010512231A	JP5570976	8/13/2014	Energy storage device and cell structure thereof	Dolby Intellectual Property Licensing, LLC	Active
219869-US-1	US	6/14/2007	US11/763083	US8110301	2/7/2012	Energy storage device and cell configuration therefor	Dolby Intellectual Property Licensing, LLC	Active
219869-ZA-7	ZA	11/6/2009	ZA200907831A	ZA200907831	7/28/2010	Energy storage device and cell configuration therefor	Dolby Intellectual Property Licensing, LLC	Active
220217-US-1	US	5/7/2007	US11/745137	US8006626	8/30/2011	System and method for cooling a battery	Dolby Intellectual Property Licensing, LLC	Active
220217-US-6	US	8/29/2011	US13/219954	US8720344	5/13/2014	Thermal management system and method	Dolby Intellectual Property Licensing, LLC	Active
220219-CN-3	CN	3/17/2008	CN200880023326A	CN101689683	3/27/2013	System and method for cooling a battery	Dolby Intellectual Property Licensing, LLC	Active
220219-DE-6	DE	3/17/2008	EP08732331A	EP2147475	11/29/2017	System for cooling a battery	Dolby Intellectual Property Licensing, LLC	Active
220219-FR-7	FR	3/17/2008	EP08732331A	EP2147475	11/29/2017	System for cooling a battery	Dolby Intellectual Property Licensing, LLC	Active
220219-GB-8	GB	3/17/2008	EP08732331A	EP2147475	11/29/2017	System for cooling a battery	Dolby Intellectual Property Licensing, LLC	Active
220219-JP-5	JP	3/17/2008	JP2010507491A	JP5491385	5/14/2014	System and method for cooling a battery	Dolby Intellectual Property Licensing, LLC	Active
220219-US-1	US	5/7/2007	US11/745109	US7921946	4/12/2011	System and method for cooling a battery	Dolby Intellectual Property Licensing, LLC	Active
220569-US-1	US	1/8/2008	US11/971126	US8055596	11/8/2011	System and method for developing a propensity model	Dolby Intellectual Property Licensing, LLC	Active
220778-CN-3	CN	12/22/2008	CN200810185380A	CN101465242	12/14/2016	There is the mems switch that the standoff voltage of improvement controls	Dolby Intellectual Property Licensing, LLC	Active
220778-DE-7	DE	12/12/2008	EP08171425A	EP2073238	11/1/2017	Mems switch with improved standoff voltage control	Dolby Intellectual Property Licensing, LLC	Active
220778-FR-8	FR	12/12/2008	EP08171425A	EP2073238	11/1/2017	Mems switch with improved standoff voltage control	Dolby Intellectual Property Licensing, LLC	Active
220778-GB-9	GB	12/12/2008	EP08171425A	EP2073238	11/1/2017	Mems switch with improved standoff voltage control	Dolby Intellectual Property Licensing, LLC	Active
220778-IT-10	IT	12/12/2008	EP08171425A	EP2073238	11/1/2017	Mems switch with improved standoff voltage control	Dolby Intellectual Property Licensing, LLC	Active
220778-JP-5	JP	12/16/2008	JP2008319542A	JP5478060	4/23/2014	Mems switch with improved standoff voltage control	Dolby Intellectual Property Licensing, LLC	Active
220778-KR-6	KR	12/19/2008	KR20080130501A	KR101529731	6/17/2015	Mems switch with improved standoff voltage control	Dolby Intellectual Property Licensing, LLC	Active
220778-US-1	US	12/21/2007	US11/962178	US7692519	4/6/2010	Mems switch with improved standoff voltage control	Dolby Intellectual Property Licensing, LLC	Active
220787-CN-3	CN	12/22/2008	CN200810188424A	CN101533740	11/13/2013	Mems microswitch having a conductive mechanical stop	Dolby Intellectual Property Licensing, LLC	Active
220787-FR-7	FR	12/11/2008	EP08171380A	EP2073236	3/2/2011	Mems microswitch having a conductive mechanical stop	Dolby Intellectual Property Licensing, LLC	Active
220787-IT-10	IT	12/11/2008	EP08171380A	EP2073236	3/2/2011	Mems microswitch having a conductive mechanical stop	Dolby Intellectual Property Licensing, LLC	Active
220787-JP-5	JP	12/12/2008	JP2008316853A	JP5449756	3/19/2014	Mems switch with conductive mechanical stopper	Dolby Intellectual Property Licensing, LLC	Active

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220787-KR-6	KR	12/18/2008	KR20080129356A	KR101538169	7/20/2015	Mems microswitch having a conductive mechanical stop	Dolby Intellectual Property Licensing, LLC	Active
220787-US-1	US	12/20/2007	US11/961767	US7609136	10/27/2009	Mems microswitch having a conductive mechanical stop	Dolby Intellectual Property Licensing, LLC	Active
220822-JP-5	JP	10/28/2008	JP2008276338A	JP5372466	12/18/2013	System and method for avoiding contact sticking in microelectromechanical system based switches	Dolby Intellectual Property Licensing, LLC	Active
220822-KR-6	KR	10/30/2008	KR20080107293A	KR101514073	4/21/2015	System and method for avoiding contact stiction in microelectromechanical system based switch	Dolby Intellectual Property Licensing, LLC	Active
220822-US-1	US	10/31/2007	US11/931353	US7808764	10/5/2010	System and method for avoiding contact stiction in micro-electromechanical system based switch	Dolby Intellectual Property Licensing, LLC	Active
220832-DE-8	DE	10/10/2008	EP08166371A	EP2050712	12/26/2018	Sealed wafer packaging of microelectromechanical systems	Dolby Intellectual Property Licensing, LLC	Active
220832-EP-4	EP	10/10/2008	EP08166371A	EP2050712	12/26/2018	Sealed wafer packaging of microelectromechanical systems	Dolby Intellectual Property Licensing, LLC	Active
220832-GB-9	GB	10/10/2008	EP08166371A	EP2050712	12/26/2018	Sealed wafer packaging of microelectromechanical systems	Dolby Intellectual Property Licensing, LLC	Active
220832-US-1	US	10/15/2007	US11/872562	US7605466	10/20/2009	Sealed wafer packaging of microelectromechanical systems	Dolby Intellectual Property Licensing, LLC	Active
220887-CN-3	CN	6/20/2007	CN200780053377A	CN101680676	5/28/2014	Micro-electromechanical system based switching in heating-ventilation-air-conditioning systems	Dolby Intellectual Property Licensing, LLC	Active
220887-DE-7	DE	6/20/2007	EP07798805A	EP2171363	8/12/2015	Micro-electromechanical system based switching in heating-ventilation-air-conditioning systems	Dolby Intellectual Property Licensing, LLC	Active
220887-JP-5	JP	6/20/2007	JP2010512139A	JP5255630	8/7/2013	Micro-electromechanical system based switching in heating, ventilation and air conditioning systems	Dolby Intellectual Property Licensing, LLC	Active
220887-KR-6	KR	6/20/2007	KR20097026184A	KR101450364	10/15/2014	Micro-electromechanical system based switching in heating-ventilation-air-conditioning systems	Dolby Intellectual Property Licensing, LLC	Active
220887-US-1	US	6/15/2007	US11/763631	US7612971	11/3/2009	Micro-electromechanical system based switching in heating-ventilation-air-conditioning systems	Dolby Intellectual Property Licensing, LLC	Active
221845-CN-3	CN	6/20/2007	CN200780053364A	CN101743606	5/8/2013	Micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
221845-DE-7	DE	6/20/2007	EP07798799A	EP2162897	2/27/2013	Micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
221845-JP-5	JP	6/20/2007	JP2010512136A	JP5124637	1/23/2013	Microelectromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
221845-US-1	US	6/15/2007	US11/763739	US8358488	1/22/2013	Micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
222176-US-1	US	10/14/2008	US12/250582	US8013548	9/6/2011	System, vehicle and related method	Dolby Intellectual Property Licensing, LLC	Active
222841-CN-4	CN	10/31/2008	CN200810191117A	CN101445513	1/8/2014	Metal oxide coatings	Dolby Intellectual Property Licensing, LLC	Active
222841-DE-5	DE	10/31/2008	DE102008037499A	DE102008037499	3/22/2018	Metal oxide coatings	Dolby Intellectual Property Licensing, LLC	Active
222841-JP-7	JP	10/31/2008	JP2008281374A	JP5535466	7/2/2014	Metal oxide coating	Dolby Intellectual Property Licensing, LLC	Active
222841-KR-8	KR	10/31/2008	KR20080107939A	KR101565613	11/3/2015	Metal oxide coatings	Dolby Intellectual Property Licensing, LLC	Active
222841-TW-9	TW	10/31/2008	TW97142062A	TWI437004	5/11/2014	Metal oxide coatings	Dolby Intellectual Property Licensing, LLC	Active

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222841-US-10	US	7/30/2009	US12/512152	US8624050	1/7/2014	Solution process for transparent conductive oxide coatings	Dolby Intellectual Property Licensing, LLC	Active
222841-US-2	US	10/31/2007	US11/931039	US7652157	1/26/2010	Metal oxide coatings	Dolby Intellectual Property Licensing, LLC	Active
222841-US-3	US	10/31/2007	US11/930991	US8404877	3/26/2013	Metal oxide coatings	Dolby Intellectual Property Licensing, LLC	Active
223351-DE-4	DE	9/17/2010	DE102010037609A	DE102010037609	3/28/2019	System and method for operating a magnetic resonance coil	Dolby Intellectual Property Licensing, LLC	Active
223351-JP-3	JP	9/22/2010	JP2010211475A	JP5658517	1/28/2015	Device for driving a magnetic resonance coil	Dolby Intellectual Property Licensing, LLC	Active
223351-NL-5	NL	9/20/2010	NL2005375A	NL2005375	3/28/2011	System and method for magnetic resonance coil actuation.	Dolby Intellectual Property Licensing, LLC	Active
223351-US-1	US	9/23/2009	US12/565236	US8198895	6/12/2012	System and method for magnetic resonance coil actuation	Dolby Intellectual Property Licensing, LLC	Active
224610-CN-3	CN	6/20/2007	CN200780100111A	CN101772814	4/30/2014	Resettable mems micro-switch array based on current limiting apparatus	Dolby Intellectual Property Licensing, LLC	Active
224610-DE-7	DE	6/20/2007	EP07796290A	EP2162891	8/12/2015	Resettable mems micro-switch array based on current limiting apparatus	Dolby Intellectual Property Licensing, LLC	Active
224610-KR-6	KR	6/20/2007	KR20107001156A	KR101415456	7/4/2014	Resettable mems micro-switch array based on current limiting apparatus	Dolby Intellectual Property Licensing, LLC	Active
224610-US-1	US	6/19/2007	US11/764908	US8072723	12/6/2011	Resettable mems micro-switch array based on current limiting apparatus	Dolby Intellectual Property Licensing, LLC	Active
224631-CN-3	CN	6/20/2007	CN200780100251A	CN101874333	7/31/2013	Remote-operable micro-electromechanical system based over-current protection apparatus	Dolby Intellectual Property Licensing, LLC	Active
224631-DE-7	DE	6/20/2007	EP07835836A	EP2162964	3/21/2018	Remote-operable micro-electromechanical system based over-current protection apparatus	Dolby Intellectual Property Licensing, LLC	Active
224631-FI-11	FI	6/20/2007	EP07835836A	EP2162964	3/21/2018	Remote-operable micro-electromechanical system based over-current protection apparatus	Dolby Intellectual Property Licensing, LLC	Active
224631-FR-8	FR	6/20/2007	EP07835836A	EP2162964	3/21/2018	Remote-operable micro-electromechanical system based over-current protection apparatus	Dolby Intellectual Property Licensing, LLC	Active
224631-GB-9	GB	6/20/2007	EP07835836A	EP2162964	3/21/2018	Remote-operable micro-electromechanical system based over-current protection apparatus	Dolby Intellectual Property Licensing, LLC	Active
224631-IT-10	IT	6/20/2007	EP07835836A	EP2162964	3/21/2018	Remote-operable micro-electromechanical system based over-current protection apparatus	Dolby Intellectual Property Licensing, LLC	Active
224631-JP-5	JP	6/20/2007	JP2010512132A	JP5364699	12/11/2013	Overcurrent protection device using a microelectromechanical system that can be operated remotely	Dolby Intellectual Property Licensing, LLC	Active
224631-SE-12	SE	6/20/2007	EP07835836A	EP2162964	3/21/2018	Remote-operable micro-electromechanical system based over-current protection apparatus	Dolby Intellectual Property Licensing, LLC	Active
224631-US-1	US	6/15/2007	US11/763824	US7885043	2/8/2011	Remote-operable micro-electromechanical system based over-current protection apparatus	Dolby Intellectual Property Licensing, LLC	Active
225009-AU-17	AU	4/10/2008	AU2008247963A	AU2008247963	1/16/2014	Electric drive vehicle retrofit system and associated method	Dolby Intellectual Property Licensing, LLC	Active
225009-AU-25	AU	10/10/2014	AU2014246607A	AU2014246607	6/2/2016	Method of operating propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-AU-7	AU	4/10/2008	AU2008247961A	AU2008247961	3/6/2014	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-CN-13	CN	4/10/2008	CN200880023502A	CN101808845	8/13/2014	Method of operating propulsion system	Dolby Intellectual Property Licensing, LLC	Active

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225009-CN-18	CN	4/10/2008	CN200880023461A	CN101808844	11/6/2013	Electric drive vehicle retrofit system and the vehicle	Dolby Intellectual Property Licensing, LLC	Active
225009-CN-22	CN	4/10/2008	CN201210138641A	CN102673413	5/6/2015	Electric drive vehicle retrofit system and associated method	Dolby Intellectual Property Licensing, LLC	Active
225009-CN-23	CN	4/10/2008	CN201210419549A	CN102897044	10/28/2015	The method of operating propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-CN-24	CN	4/10/2008	CN201310273800A	CN103332121	2/24/2016	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-CN-8	CN	4/10/2008	CN200880023481A	CN102015354	5/28/2014	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-DE-30	DE	4/10/2008	EP08745446A	EP2146862	10/2/2019	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-DE-33	DE	4/10/2008	EP08745447A	EP2146863	6/23/2021	Method of operating a propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-EP-14	EP	4/10/2008	EP08745447A	EP2146863	6/23/2021	Method of operating a propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-EP-9	EP	4/10/2008	EP08745446A	EP2146862	10/2/2019	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-FR-29	FR	4/10/2008	EP08745446A	EP2146862	10/2/2019	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-FR-34	FR	4/10/2008	EP08745447A	EP2146863	6/23/2021	Method of operating a propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-GB-31	GB	4/10/2008	EP08745446A	EP2146862	10/2/2019	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-GB-35	GB	4/10/2008	EP08745447A	EP2146863	6/23/2021	Method of operating a propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-JP-10	JP	4/10/2008	JP2010507498A	JP5525441	6/18/2014	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-US-1	US	5/7/2007	US11/745179	US7723932	5/25/2010	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-US-2	US	5/7/2007	US11/745191	US9073448	7/7/2015	Method of operating propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-US-3	US	5/7/2007	US11/745180	US8001906	8/23/2011	Electric drive vehicle retrofit system and associated method	Dolby Intellectual Property Licensing, LLC	Active
225009-ZA-11	ZA	11/20/2009	ZA200908225A	ZA200908225	7/28/2010	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-ZA-16	ZA	11/20/2009	ZA200908226A	ZA200908226	7/28/2010	Method of operating propulsion system	Dolby Intellectual Property Licensing, LLC	Active
225009-ZA-21	ZA	11/20/2009	ZA200908227A	ZA200908227	7/28/2010	Electric drive vehicle retrofit system and associated method	Dolby Intellectual Property Licensing, LLC	Active
225017-US-1	US	9/17/2008	US12/211854	US8114382	2/14/2012	Myelin detection using benzofuran derivatives	Dolby Intellectual Property Licensing, LLC	Active
225160-US-1	US	12/18/2007	US11/958604	US7879963	2/1/2011	Composition, article, and associated method	Dolby Intellectual Property Licensing, LLC	Active
225349-US-1	US	10/7/2008	US12/246518	US8765275	7/1/2014	Energy storage device and associated method	Dolby Intellectual Property Licensing, LLC	Active
225533-AU-12	AU	1/29/2016	AU2016200572A	AU2016200572	12/8/2016	Seal ring and associated method	Dolby Intellectual Property Licensing, LLC	Active

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225533-CN-4	CN	7/14/2009	CN200980132797A	CN102124590	7/30/2014	Seal ring and associated method	Dolby Intellectual Property Licensing, LLC	Active
225533-DE-8	DE	7/14/2009	EP09790350A	EP2327118	4/22/2015	Seal ring and associated method	Dolby Intellectual Property Licensing, LLC	Active
225533-GB-9	GB	7/14/2009	EP09790350A	EP2327118	4/22/2015	Seal ring and associated method	Dolby Intellectual Property Licensing, LLC	Active
225533-IT-10	IT	7/14/2009	EP09790350A	EP2327118	4/22/2015	Seal ring and associated method	Dolby Intellectual Property Licensing, LLC	Active
225533-JP-6	JP	7/14/2009	JP2011523842A	JP5730201	6/3/2015	Seal rings and related methods	Dolby Intellectual Property Licensing, LLC	Active
225533-US-1	US	8/19/2008	US12/193796	US9166214	10/20/2015	Seal ring and associated method	Dolby Intellectual Property Licensing, LLC	Active
225533-US-11	US	9/3/2015	US14/844659	US9966578	5/8/2018	Seal ring and associated method	Dolby Intellectual Property Licensing, LLC	Active
225533-ZA-7	ZA	3/7/2011	ZA201101741A	ZA201101741	1/25/2012	Seal ring and associated method	Dolby Intellectual Property Licensing, LLC	Active
225698-DE-2	DE	11/27/2009	DE102009044684A	DE102009044684	6/10/2010	Apparatus for highly efficient operation of fuel cell systems and method for the production thereof	Dolby Intellectual Property Licensing, LLC	Active
225698-US-1	US	12/2/2008	US12/326171	US8486570	7/16/2013	Apparatus for high efficiency operation of fuel cell systems and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
225698-US-3	US	7/9/2013	US13/937643	US9148085	9/29/2015	Apparatus and method for high efficiency operation of fuel cell systems	Dolby Intellectual Property Licensing, LLC	Active
225698-US-4	US	9/28/2015	US14/867652	US10056630	8/21/2018	Apparatus and method for high efficiency operation of fuel cell systems	Dolby Intellectual Property Licensing, LLC	Active
225698-US-5	US	7/13/2018	US16/034817	US11075394	7/27/2021	Apparatus and method for high efficiency operation of fuel cell systems	Dolby Intellectual Property Licensing, LLC	Active
225698-US-6	US	6/18/2021	US17/351653	US11670788	6/6/2023	Apparatus and method for high efficiency operation of fuel cell systems	Dolby Intellectual Property Licensing, LLC	Active
226798-CN-2	CN	11/14/2008	CN200810176200A	CN101436048	1/13/2016	There is the programmable logic controller (plc) of the switching based on mems (micro electro mechanical system)	Dolby Intellectual Property Licensing, LLC	Active
226798-FR-8	FR	11/7/2008	EP08168549A	EP2065770	1/9/2013	Programmable logic controller having micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
226798-JP-4	JP	11/12/2008	JP2008289347A	JP5576604	8/20/2014	Programmable logic controller with switch using micro electromechanical system	Dolby Intellectual Property Licensing, LLC	Active
226798-KR-5	KR	11/13/2008	KR20080112580A	KR101519143	5/11/2015	/ programmable logic controller having micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
226798-MX-6	MX	11/13/2008	MX2008014542A	MX2008014542	5/27/2009	Programmable logic controller having micro-electromechanical system based switching.	Dolby Intellectual Property Licensing, LLC	Active
226798-US-1	US	11/14/2007	US11/939729	US7839611	11/23/2010	Programmable logic controller having micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
226893-US-3	US	10/10/2008	US12/682302	US8662155	3/4/2014	Chip cooling device having wedge element	Dolby Intellectual Property Licensing, LLC	Active
227074-US-1	US	7/15/2008	US12/173549	US8644037	2/4/2014	Ac-ac converter with high frequency link	Dolby Intellectual Property Licensing, LLC	Active
227091-CN-3	CN	4/21/2009	CN200980000313A	CN101687710	12/17/2014	Composite article and related method	Dolby Intellectual Property Licensing, LLC	Active
227091-JP-5	JP	4/21/2009	JP2011510534A	JP5492195	5/14/2014	Composite product and manufacturing method	Dolby Intellectual Property Licensing, LLC	Active

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227091-US-1	US	5/19/2008	US12/122924	US7939050	5/10/2011	Composite article and related method	Dolby Intellectual Property Licensing, LLC	Active
227305-US-1	US	12/20/2007	US11/961532	US8159002	4/17/2012	Heterostructure device and associated method	Dolby Intellectual Property Licensing, LLC	Active
227305-US-2	US	3/13/2012	US13/418566	US8697506	4/15/2014	Heterostructure device and associated method	Dolby Intellectual Property Licensing, LLC	Active
227568-TW-3	TW	7/16/2008	TW97127051 A	TWI429731	3/11/2014	Red line emitting complex fluoride phosphors activated with mn4+	Dolby Intellectual Property Licensing, LLC	Active
227568-US-2	US	7/16/2008	US12/174236	US7847309	12/7/2010	Red line emitting complex fluoride phosphors activated with mn4+	Dolby Intellectual Property Licensing, LLC	Active
227731-CN-4	CN	11/14/2008	CN200880016 755A	CN101730956	10/30/2013	Energy storage device and method using ternary electrolyte	Dolby Intellectual Property Licensing, LLC	Active
227731-US-1	US	12/20/2007	US11/961024	US7993768	8/9/2011	Energy storage device and method	Dolby Intellectual Property Licensing, LLC	Active
227889-CN-2	CN	10/31/2008	CN200810175 980A	CN101436490	1/29/2014	Micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
227889-DE-7	DE	10/24/2008	EP08167480A	EP2056315	7/23/2014	Micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
227889-FR-8	FR	10/24/2008	EP08167480A	EP2056315	7/23/2014	Micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
227889-GB-9	GB	10/24/2008	EP08167480A	EP2056315	7/23/2014	Micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
227889-IT-10	IT	10/24/2008	EP08167480A	EP2056315	7/23/2014	Micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
227889-JP-4	JP	10/30/2008	JP2008279202 A	JP5346551	11/20/2013	Switching based on micro electromechanical systems	Dolby Intellectual Property Licensing, LLC	Active
227889-KR-5	KR	10/30/2008	KR200801073 02A	KR101503929	3/18/2015	Micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
227889-MX-6	MX	10/30/2008	MX200801394 4A	MX2008013 944	5/26/2009	Micro-electromechanical system based switching.	Dolby Intellectual Property Licensing, LLC	Active
227889-US-1	US	11/1/2007	US11/933856	US7554222	6/30/2009	Micro-electromechanical system based switching	Dolby Intellectual Property Licensing, LLC	Active
228008-US-1	US	10/15/2008	US12/251665	US9960461	5/1/2018	System and method for temperature control of multi-battery systems	Dolby Intellectual Property Licensing, LLC	Active
228038-US-1	US	9/29/2008	US12/240200	US8217751	7/10/2012	Electronic device and method	Dolby Intellectual Property Licensing, LLC	Active
228073-US-1	US	11/5/2008	US12/265037	US8047317	11/1/2011	System, vehicle, and method	Dolby Intellectual Property Licensing, LLC	Active
228080-JP-2	JP	12/1/2009	JP2009273090 A	JP5639357	12/10/2014	System and method for a vehicle-based uninterruptible power supply	Dolby Intellectual Property Licensing, LLC	Active
228080-JP-3	JP	5/12/2014	JP2014098256 A	JP6050780	12/21/2016	Uninterruptible power supply system using vehicles	Dolby Intellectual Property Licensing, LLC	Active
228080-US-1	US	12/2/2008	US12/326189	US7960857	6/14/2011	System and method for vehicle based uninterruptable power supply	Dolby Intellectual Property Licensing, LLC	Active
228113-AU-2	AU	5/15/2009	AU200920194 0A	AU2009201 940	11/7/2013	High efficiency, multi-source photovoltaic inverter	Dolby Intellectual Property Licensing, LLC	Active
228113-CN-3	CN	5/22/2009	CN200910145 253A	CN101594068	1/28/2015	High efficiency multi-source photovoltaic inverter	Dolby Intellectual Property Licensing, LLC	Active

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228113-DE-5	DE	5/19/2009	EP09160660A	EP2128972	7/18/2018	High efficiency multi-source photovoltaic inverter	Dolby Intellectual Property Licensing, LLC	Active
228113-EP-4	EP	5/19/2009	EP09160660A	EP2128972	7/18/2018	High efficiency multi-source photovoltaic inverter	Dolby Intellectual Property Licensing, LLC	Active
228113-ES-6	ES	5/19/2009	EP09160660A	EP2128972	7/18/2018	High efficiency multi-source photovoltaic inverter	Dolby Intellectual Property Licensing, LLC	Active
228113-GB-7	GB	5/19/2009	EP09160660A	EP2128972	7/18/2018	High efficiency multi-source photovoltaic inverter	Dolby Intellectual Property Licensing, LLC	Active
228113-IT-8	IT	5/19/2009	EP09160660A	EP2128972	7/18/2018	High efficiency multi-source photovoltaic inverter	Dolby Intellectual Property Licensing, LLC	Active
228113-TR-9	TR	5/19/2009	EP09160660A	EP2128972	7/18/2018	High efficiency multi-source photovoltaic inverter	Dolby Intellectual Property Licensing, LLC	Active
228113-US-1	US	5/27/2008	US12/154745	US7929325	4/19/2011	High efficiency, multi-source photovoltaic inverter	Dolby Intellectual Property Licensing, LLC	Active
228145-US-1	US	7/31/2008	US12/183326	US8229170	7/24/2012	Method and system for detecting a signal structure from a moving video platform	Dolby Intellectual Property Licensing, LLC	Active
228145-US-2	US	7/31/2008	US12/183334	US8233662	7/31/2012	Method and system for detecting signal color from a moving video platform	Dolby Intellectual Property Licensing, LLC	Active
228276-US-1	US	8/11/2008	US12/189221	US8049097	11/1/2011	Solar cell including cooling channels and method for fabrication	Dolby Intellectual Property Licensing, LLC	Active
228365-US-1	US	12/30/2008	US12/346378	US8194520	6/5/2012	Disc structure for bit-wise holographic storage	Dolby Intellectual Property Licensing, LLC	Active
228583-CH-11	CH	9/4/2009	EP09169531A	EP2164089	4/12/2017	Micro-electromechanical switch protection in series parallel topology	Dolby Intellectual Property Licensing, LLC	Active
228583-CN-2	CN	9/10/2009	CN200910176354A	CN101673945	1/28/2015	Micro-electromechanical switch protection in series parallel topology	Dolby Intellectual Property Licensing, LLC	Active
228583-DE-6	DE	9/4/2009	EP09169531A	EP2164089	4/12/2017	Micro-electromechanical switch protection in series parallel topology	Dolby Intellectual Property Licensing, LLC	Active
228583-FI-12	FI	9/4/2009	EP09169531A	EP2164089	4/12/2017	Micro-electromechanical switch protection in series parallel topology	Dolby Intellectual Property Licensing, LLC	Active
228583-FR-7	FR	9/4/2009	EP09169531A	EP2164089	4/12/2017	Micro-electromechanical switch protection in series parallel topology	Dolby Intellectual Property Licensing, LLC	Active
228583-GB-8	GB	9/4/2009	EP09169531A	EP2164089	4/12/2017	Micro-electromechanical switch protection in series parallel topology	Dolby Intellectual Property Licensing, LLC	Active
228583-IT-9	IT	9/4/2009	EP09169531A	EP2164089	4/12/2017	Micro-electromechanical switch protection in series parallel topology	Dolby Intellectual Property Licensing, LLC	Active
228583-JP-3	JP	9/8/2009	JP2009206541A	JP5448660	3/19/2014	Electrical switching device	Dolby Intellectual Property Licensing, LLC	Active
228583-KR-4	KR	9/10/2009	KR20090085284A	KR101647142	8/9/2016	Micro-electromechanical switch protection in series parallel topology	Dolby Intellectual Property Licensing, LLC	Active
228583-SE-10	SE	9/4/2009	EP09169531A	EP2164089	4/12/2017	Micro-electromechanical switch protection in series parallel topology	Dolby Intellectual Property Licensing, LLC	Active
228583-US-1	US	9/11/2008	US12/209064	US8687325	4/1/2014	Micro-electromechanical switch protection in series parallel topology	Dolby Intellectual Property Licensing, LLC	Active
229454-US-1	US	11/13/2008	US12/270247	US8034457	10/11/2011	Seal structure and associated method	Dolby Intellectual Property Licensing, LLC	Active
229947-US-1	US	4/1/2009	US12/416292	US8054147	11/8/2011	High voltage switch and method of making	Dolby Intellectual Property Licensing, LLC	Active

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229967-CN-3	CN	12/22/2009	CN200910215175A	CN101866780	6/8/2016	Micro electro-mechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
229967-DE-8	DE	12/8/2009	EP09178257A	EP2200063	2/27/2019	Micro-electromechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
229967-EP-4	EP	12/8/2009	EP09178257A	EP2200063	2/27/2019	Micro-electromechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
229967-FR-7	FR	12/8/2009	EP09178257A	EP2200063	2/27/2019	Micro-electromechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
229967-GB-9	GB	12/8/2009	EP09178257A	EP2200063	2/27/2019	Micro-electromechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
229967-JP-5	JP	12/16/2009	JP2009284638A	JP5588663	9/10/2014	Micro electromechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
229967-KR-6	KR	12/21/2009	KR20090127639A	KR101745722	6/9/2017	Micro-electromechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
229967-US-1	US	12/22/2008	US12/340775	US8093971	1/10/2012	Micro-electromechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
229968-CA-2	CA	12/4/2008	CA2645820A	CA2645820	3/7/2017	Mems microswitch having a dual actuator and shared gate	Dolby Intellectual Property Licensing, LLC	Active
229968-CN-3	CN	12/22/2008	CN200810188423A	CN101465243	2/4/2015	Mems microswitch having a dual actuator and shared gate	Dolby Intellectual Property Licensing, LLC	Active
229968-DE-7	DE	12/11/2008	EP08171381A	EP2073237	10/19/2016	Mems microswitch having a dual actuator and shared gate	Dolby Intellectual Property Licensing, LLC	Active
229968-FR-8	FR	12/11/2008	EP08171381A	EP2073237	10/19/2016	Mems microswitch having a dual actuator and shared gate	Dolby Intellectual Property Licensing, LLC	Active
229968-GB-9	GB	12/11/2008	EP08171381A	EP2073237	10/19/2016	Mems microswitch having a dual actuator and shared gate	Dolby Intellectual Property Licensing, LLC	Active
229968-IT-10	IT	12/11/2008	EP08171381A	EP2073237	10/19/2016	Mems microswitch having a dual actuator and shared gate	Dolby Intellectual Property Licensing, LLC	Active
229968-JP-5	JP	12/12/2008	JP2008316857A	JP5530624	6/25/2014	Mems microswitch with dual actuator and shared gate	Dolby Intellectual Property Licensing, LLC	Active
229968-KR-6	KR	12/18/2008	KR20080129367A	KR101541915	8/4/2015	Mems microswitch having a dual actuator and shared gate	Dolby Intellectual Property Licensing, LLC	Active
229968-US-1	US	12/20/2007	US11/961737	US8610519	12/17/2013	Mems microswitch having a dual actuator and shared gate	Dolby Intellectual Property Licensing, LLC	Active
229972-US-1	US	10/3/2008	US12/245428	US8603659	12/10/2013	Sealing glass composition and article	Dolby Intellectual Property Licensing, LLC	Active
230506-US-1	US	11/13/2008	US12/270258	US8043986	10/25/2011	Sealing glass composition, method and article	Dolby Intellectual Property Licensing, LLC	Active
230521-US-3	US	1/23/2008	US12/519784	US9065133	6/23/2015	Cathode for an electrochemical cell	Dolby Intellectual Property Licensing, LLC	Active
230537-CN-3	CN	7/13/2010	CN201080049793A	CN102598348	11/25/2015	Battery pack arrangement and correlation technique	Dolby Intellectual Property Licensing, LLC	Active
230537-ZA-5	ZA	2/13/2012	ZA201201844A	ZA201201844	11/28/2012	Battery pack assembly and related processes	Dolby Intellectual Property Licensing, LLC	Active
230709-US-1	US	1/9/2009	US12/351131	US8334053	12/18/2012	Seal structure and associated method	Dolby Intellectual Property Licensing, LLC	Active
231192-CN-2	CN	8/26/2010	CN201010273552A	CN102005925	11/25/2015	There is the power supply of piezoelectric transformer and the method for power transfer	Dolby Intellectual Property Licensing, LLC	Active

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231192-JP-3	JP	8/27/2010	JP2010190196A	JP5749906	7/15/2015	Power supply with piezoelectric transformer and method of power conversion	Dolby Intellectual Property Licensing, LLC	Active
231192-US-1	US	8/28/2009	US12/550029	US8659921	2/25/2014	Power supply with a piezoelectric transformer and method for power conversion	Dolby Intellectual Property Licensing, LLC	Active
232246-DE-2	DE	10/8/2009	DE102009044211A	DE102009044211	3/21/2024	Energy management system for improving the efficiency of electric and hybrid powertrains	Dolby Intellectual Property Licensing, LLC	Active
232246-JP-3	JP	10/7/2009	JP2009232927A	JP5736110	6/17/2015	Propulsion system, method for assembling control system, and energy storage device	Dolby Intellectual Property Licensing, LLC	Active
232246-US-1	US	10/13/2008	US12/250182	US8120290	2/21/2012	Energy management system to improve efficiency of electric and hybrid drive trains	Dolby Intellectual Property Licensing, LLC	Active
232258-CN-3	CN	4/26/2012	CN201210138329A	CN102856100	9/14/2016	There are the switch arrays of the circuit of the annual distribution adjusting the gating signal being applied to switch arrays	Dolby Intellectual Property Licensing, LLC	Active
232258-US-1	US	5/29/2009	US12/474299	US8427792	4/23/2013	Method and system to enhance reliability of switch array	Dolby Intellectual Property Licensing, LLC	Active
232258-US-2	US	4/28/2011	US13/096071	US8582254	11/12/2013	Switching array having circuitry to adjust a temporal distribution of a gating signal applied to the array	Dolby Intellectual Property Licensing, LLC	Active
232260-US-1	US	4/30/2009	US12/433107	US8435673	5/7/2013	Cathode composition with phosphorus composition additive and electrochemical cell comprising same	Dolby Intellectual Property Licensing, LLC	Active
232492-US-1	US	4/4/2011	US13/066000	US9007689	4/14/2015	Method and apparatus for forming multiple images	Dolby Intellectual Property Licensing, LLC	Active
232652-AU-10	AU	4/16/2014	AU2014202139A	AU2014202139	2/11/2016	Method and system for control of a vehicle energy storage device	Dolby Intellectual Property Licensing, LLC	Active
232652-AU-3	AU	7/2/2009	AU2009274296A	AU2009274296	1/16/2014	Method and system for control of a vehicle energy storage device	Dolby Intellectual Property Licensing, LLC	Active
232652-CN-4	CN	7/2/2009	CN200980138134A	CN102164772	6/3/2015	Method and system for control of a vehicle energy storage device	Dolby Intellectual Property Licensing, LLC	Active
232652-DE-12	DE	7/2/2009	EP09790050A	EP2307227	10/9/2019	Method and system for control of a vehicle energy storage device	Dolby Intellectual Property Licensing, LLC	Active
232652-EP-5	EP	7/2/2009	EP09790050A	EP2307227	10/9/2019	Method and system for control of a vehicle energy storage device	Dolby Intellectual Property Licensing, LLC	Active
232652-JP-9	JP	1/24/2013	JP2013010706A	JP5675858	2/25/2015	Method and system for controlling an energy storage device for a vehicle	Dolby Intellectual Property Licensing, LLC	Active
232652-US-1	US	7/24/2008	US12/179188	US8212532	7/3/2012	Method and system for control of a vehicle energy storage device	Dolby Intellectual Property Licensing, LLC	Active
232652-US-8	US	7/3/2012	US13/541549	US8587260	11/19/2013	Method and system for control of a vehicle energy storage device	Dolby Intellectual Property Licensing, LLC	Active
232652-ZA-7	ZA	2/9/2011	ZA201101056A	ZA201101056	10/26/2011	Method and system for control of a vehicle energy storage device	Dolby Intellectual Property Licensing, LLC	Active
232737-CN-2	CN	12/1/2009	CN200910253369A	CN101746247	1/6/2016	Auxiliary drive apparatus and manufacture method thereof	Dolby Intellectual Property Licensing, LLC	Active
232737-DE-10	DE	11/20/2009	EP09176593A	EP2193954	10/21/2020	Auxiliary drive apparatus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
232737-EP-3	EP	11/20/2009	EP09176593A	EP2193954	10/21/2020	Auxiliary drive apparatus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
232737-ES-12	ES	11/20/2009	EP09176593A	EP2193954	10/21/2020	Auxiliary drive apparatus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
232737-FR-9	FR	11/20/2009	EP09176593A	EP2193954	10/21/2020	Auxiliary drive apparatus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active

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232737-GB-13	GB	11/20/2009	EP09176593A	EP2193954	10/21/2020	Auxiliary drive apparatus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
232737-IT-11	IT	11/20/2009	EP09176593A	EP2193954	10/21/2020	Auxiliary drive apparatus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
232737-JP-7	JP	10/7/2013	JP2013209761A	JP5844787	1/20/2016	Auxiliary drive device and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
232737-KR-5	KR	12/1/2009	KR20090117742A	KR101614948	4/22/2016	Auxiliary drive apparatus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
232737-US-1	US	12/2/2008	US12/326152	US8274173	9/25/2012	Auxiliary drive apparatus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
232737-US-6	US	8/7/2012	US13/568251	US9061595	6/23/2015	Auxiliary drive apparatus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
232802-CN-2	CN	1/29/2010	CN201010114878A	CN101817342	3/26/2014	Modular auxiliary power unit assembly for an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
232802-US-1	US	1/29/2009	US12/362218	US8376070	2/19/2013	Modular auxiliary power unit assembly for an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
232802-US-5	US	2/15/2013	US13/767962	US8695739	4/15/2014	Modular auxiliary power unit assembly for an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
233177-US-1	US	9/18/2008	US12/284132	US7994418	8/9/2011	Monolithically connected photovoltaic devices on flexible substrates	Dolby Intellectual Property Licensing, LLC	Active
233585-US-1	US	12/12/2008	US12/334019	US8199681	6/12/2012	Software radio frequency canceller	Dolby Intellectual Property Licensing, LLC	Active
233619-DE-4	DE	3/23/2010	EP10157266A	EP2236370	5/16/2018	Apparatus and method for advanced anti-skid brake and traction controls	Dolby Intellectual Property Licensing, LLC	Active
233619-FR-5	FR	3/23/2010	EP10157266A	EP2236370	5/16/2018	Apparatus and method for advanced anti-skid brake and traction controls	Dolby Intellectual Property Licensing, LLC	Active
233619-GB-6	GB	3/23/2010	EP10157266A	EP2236370	5/16/2018	Apparatus and method for advanced anti-skid brake and traction controls	Dolby Intellectual Property Licensing, LLC	Active
233619-JP-3	JP	3/24/2010	JP2010067176A	JP5651357	1/14/2015	Disc brake system	Dolby Intellectual Property Licensing, LLC	Active
233619-US-1	US	3/30/2009	US12/413856	US9796364	10/24/2017	Apparatus and method for advanced anti-skid brake and traction controls	Dolby Intellectual Property Licensing, LLC	Active
233633-US-1	US	2/25/2009	US12/392609	US8688046	4/1/2014	Quiet spectrum harvester	Dolby Intellectual Property Licensing, LLC	Active
233635-AU-5	AU	6/3/2010	AU2010256533A	AU2010256533	12/15/2011	Imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-CA-6	CA	6/3/2010	CA2764366A	CA2764366	12/4/2018	Imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-CN-7	CN	6/3/2010	CN201080025128A	CN102802672	12/16/2015	The imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-DE-10	DE	6/3/2010	EP10728034A	EP2437792	10/21/2015	Imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-DK-11	DK	6/3/2010	EP10728034A	EP2437792	10/21/2015	Imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-FI-12	FI	6/3/2010	EP10728034A	EP2437792	10/21/2015	Imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-FR-13	FR	6/3/2010	EP10728034A	EP2437792	10/21/2015	Imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active

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233635-GB-14	GB	6/3/2010	EP10728034A	EP2437792	10/21/2015	Imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-JP-9	JP	6/3/2010	JP2012514124A	JP5897461	3/30/2016	Imaging myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-NL-15	NL	6/3/2010	EP10728034A	EP2437792	10/21/2015	Imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-NO-16	NO	6/3/2010	EP10728034A	EP2437792	10/21/2015	Imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-SE-17	SE	6/3/2010	EP10728034A	EP2437792	10/21/2015	Imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-US-1	US	6/4/2009	US12/478300	US8617515	12/31/2013	Imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233635-US-4	US	2/21/2011	US13/031349	US8658129	2/25/2014	Agents and methods for the imaging of myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
233705-US-1	US	12/16/2008	US12/336009	US9130747	9/8/2015	Software radio frequency canceller	Dolby Intellectual Property Licensing, LLC	Active
233920-US-1	US	4/3/2009	US12/418039	US7973424	7/5/2011	Method and apparatus for producing tractive effort with interface to other apparatus	Dolby Intellectual Property Licensing, LLC	Active
234194-US-1	US	8/19/2009	US12/543785	US7885011	2/8/2011	Objective for optical imaging systems	Dolby Intellectual Property Licensing, LLC	Active
234194-US-2	US	6/23/2010	US12/821731	US8169696	5/1/2012	Systems for intraoperative nerve imaging	Dolby Intellectual Property Licensing, LLC	Active
234201-CN-2	CN	3/11/2010	CN201010144018A	CN101837775	1/6/2016	For the system and method that optimization energy reservoir part uses	Dolby Intellectual Property Licensing, LLC	Active
234201-DE-6	DE	3/8/2010	EP10155723A	EP2228275	7/4/2018	Vehicle with optimizing of the energy storage component usage	Dolby Intellectual Property Licensing, LLC	Active
234201-EP-3	EP	3/8/2010	EP10155723A	EP2228275	7/4/2018	Vehicle with optimizing of the energy storage component usage	Dolby Intellectual Property Licensing, LLC	Active
234201-FR-8	FR	3/8/2010	EP10155723A	EP2228275	7/4/2018	Vehicle with optimizing of the energy storage component usage	Dolby Intellectual Property Licensing, LLC	Active
234201-GB-7	GB	3/8/2010	EP10155723A	EP2228275	7/4/2018	Vehicle with optimizing of the energy storage component usage	Dolby Intellectual Property Licensing, LLC	Active
234201-IN-4	IN	2/25/2010	IN422DE2010A	IN339416	7/3/2020	Vehicle with optimized energy storage component	Dolby Intellectual Property Licensing, LLC	Active
234201-JP-5	JP	3/9/2010	JP2010051225A	JP5736115	6/17/2015	Vehicles that optimize the use of energy storage components	Dolby Intellectual Property Licensing, LLC	Active
234201-US-1	US	3/11/2009	US12/401726	US8024082	9/20/2011	System and method for optimizing energy storage component usage	Dolby Intellectual Property Licensing, LLC	Active
234321-US-1	US	5/1/2009	US12/433992	US8154149	4/10/2012	Method and apparatus for charging a vehicle energy storage system	Dolby Intellectual Property Licensing, LLC	Active
234422-CN-2	CN	8/13/2010	CN201010258366A	CN102176391	8/21/2013	Switch structures	Dolby Intellectual Property Licensing, LLC	Active
234422-KR-5	KR	8/13/2010	KR20100078421A	KR101766482	8/8/2017	Switch structures	Dolby Intellectual Property Licensing, LLC	Active
234422-US-1	US	8/14/2009	US12/541321	US7928333	4/19/2011	Switch structures	Dolby Intellectual Property Licensing, LLC	Active
234574-US-1	US	3/30/2009	US12/414234	US7961572	6/14/2011	System and method for reading micro-holograms with reduced error rates	Dolby Intellectual Property Licensing, LLC	Active

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234577-DE-2	DE	2/9/2010	DE102010000347A	DE102010000347	8/19/2010	Electrically driven power take-off system and method for its production	Dolby Intellectual Property Licensing, LLC	Active
234577-US-1	US	2/18/2009	US12/372880	US8115334	2/14/2012	Electrically driven power take-off system and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
234828-US-1	US	2/16/2009	US12/371675	US8118237	2/21/2012	System and method for vehicle temperature control	Dolby Intellectual Property Licensing, LLC	Active
234863-US-1	US	3/30/2009	US12/414284	US8327247	12/4/2012	Bit probability estimation method for noisy modulation code	Dolby Intellectual Property Licensing, LLC	Active
234866-US-1	US	3/30/2009	US12/414310	US7916605	3/29/2011	Joint dc minimization and bit detection	Dolby Intellectual Property Licensing, LLC	Active
234874-US-1	US	3/30/2009	US12/414263	US9318145	4/19/2016	Method for decoding under optical and electronic noise	Dolby Intellectual Property Licensing, LLC	Active
234996-US-1	US	2/25/2009	US12/392751	US9563889	2/7/2017	Method and apparatus for secure wireless point of sale transactions	Dolby Intellectual Property Licensing, LLC	Active
235033-DE-7	DE	3/26/2010	EP10158010A	EP2236344	11/10/2021	System for conveying electrical energy	Dolby Intellectual Property Licensing, LLC	Active
235033-EP-2	EP	3/26/2010	EP10158010A	EP2236344	11/10/2021	System for conveying electrical energy	Dolby Intellectual Property Licensing, LLC	Active
235033-EP-5	EP	3/26/2010	EP21205291A	EP4009512	6/8/2022	Apparatus, method, and system for conveying electrical energy	Dolby Intellectual Property Licensing, LLC	Active
235033-FR-6	FR	3/26/2010	EP10158010A	EP2236344	11/10/2021	System for conveying electrical energy	Dolby Intellectual Property Licensing, LLC	Active
235033-GB-8	GB	3/26/2010	EP10158010A	EP2236344	11/10/2021	System for conveying electrical energy	Dolby Intellectual Property Licensing, LLC	Active
235033-JP-3	JP	3/30/2010	JP2010076542A	JP5809392	11/10/2015	Apparatus, method and system for transporting electrical energy	Dolby Intellectual Property Licensing, LLC	Active
235033-US-1	US	4/3/2009	US12/417983	US7928598	4/19/2011	Apparatus, method, and system for conveying electrical energy	Dolby Intellectual Property Licensing, LLC	Active
235033-US-4	US	3/29/2011	US13/074323	US8154151	4/10/2012	Apparatus, method, and system for conveying electrical energy	Dolby Intellectual Property Licensing, LLC	Active
235141-CN-3	CN	3/17/2010	CN201010157228A	CN101837722	12/2/2015	For system and the manufacture method thereof of vehicle propulsion	Dolby Intellectual Property Licensing, LLC	Active
235141-JP-6	JP	3/10/2010	JP2010052445A	JP6247808	12/13/2017	System for propulsion of vehicle having cvt and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
235141-US-2	US	3/17/2009	US12/405874	US8535200	9/17/2013	Vehicle propulsion system having a continuously variable transmission and method of making same	Dolby Intellectual Property Licensing, LLC	Active
235150-BR-2	BR	10/19/2009	BRPI0904082A	BRPI0904082	5/28/2019	Engine drive circuit	Dolby Intellectual Property Licensing, LLC	Active
235150-CA-17	CA	10/15/2009	CA3005188A	CA3005188	6/30/2020	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-CA-18	CA	10/15/2009	CA3056633A	CA3056633	4/13/2021	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-CA-19	CA	10/15/2009	CA3056637A	CA3056637	9/27/2022	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-CA-3	CA	10/15/2009	CA2682843A	CA2682843	4/30/2019	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-CN-4	CN	10/22/2009	CN200910209818A	CN101729020	12/24/2014	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active

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235150-EP-22	EP	10/14/2009	EP19199167A	EP3641097	4/22/2020	Electric vehicle charging system	Dolby Intellectual Property Licensing, LLC	Active
235150-IN-6	IN	10/7/2009	IN2082DE2009A	IN329900	1/24/2020	Apparatus for energy transfer using converter and method	Dolby Intellectual Property Licensing, LLC	Active
235150-JP-7	JP	10/20/2009	JP2009240958A	JP5674301	2/25/2015	Device for energy transfer using a transducer and method of manufacturing the same	Dolby Intellectual Property Licensing, LLC	Active
235150-KR-13	KR	9/1/2016	KR20160112685A	KR101733931	5/8/2017	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-KR-8	KR	10/22/2009	KR20090100663A	KR101655411	9/7/2016	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-US-1	US	10/22/2008	US12/256466	US8080973	12/20/2011	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-US-10	US	2/27/2012	US13/406208	US9024573	5/5/2015	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-US-11	US	2/27/2012	US13/406241	US10131234	11/20/2018	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-US-12	US	1/15/2015	US14/597852	US9321367	4/26/2016	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-US-14	US	11/4/2016	US15/343493	US9809121	11/7/2017	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-US-15	US	9/7/2017	US15/697948	US9975439	5/22/2018	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-US-16	US	4/4/2018	US15/945168	US10604023	3/31/2020	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-US-23	US	2/11/2020	US16/787185	US10994623	5/4/2021	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-US-24	US	4/5/2021	US17/222270	US11752887	9/12/2023	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235150-US-9	US	12/8/2011	US13/314572	US9227523	1/5/2016	Apparatus for energy transfer using converter and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235152-DE-2	DE	10/16/2009	DE102009044281A	DE102009044281	4/29/2010	Device for transmitting energy by means of power electronics and machine inductance, and method for producing the same	Dolby Intellectual Property Licensing, LLC	Active
235152-JP-3	JP	10/20/2009	JP2009240959A	JP5813283	11/17/2015	Vehicle having power electronic device and device for transmitting energy using mechanical inductance	Dolby Intellectual Property Licensing, LLC	Active
235152-KR-4	KR	10/22/2009	KR20090100614A	KR101652379	8/30/2016	Apparatus for transferring energy using power electronics and machine inductance and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235152-KR-9	KR	8/7/2017	KR20170099594A	KR101829173	2/13/2018	Apparatus for transferring energy using power electronics and machine inductance and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235152-US-1	US	10/22/2008	US12/256457	US7932633	4/26/2011	Apparatus for transferring energy using power electronics and machine inductance and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235152-US-5	US	3/25/2011	US13/072085	US8653696	2/18/2014	Apparatus for transferring energy using power electronics and machine inductance and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active

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235152-US-6	US	1/31/2014	US14/169338	US9620974	4/11/2017	Apparatus for transferring energy using power electronics and machine inductance and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235152-US-8	US	11/15/2016	US15/351608	US11167654	11/9/2021	Apparatus for transferring energy using power electronics and machine inductance and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
235526-AU-2	AU	11/12/2010	AU201024142 9A	AU2010241 429	6/2/2011	Systems and apparatus relating to solar-thermal power generation	Dolby Intellectual Property Licensing, LLC	Active
235526-CN-3	CN	11/16/2010	CN201010564 304A	CN10206206 6	11/26/2014	Apparatus relating to solar-thermal power generation	Dolby Intellectual Property Licensing, LLC	Active
235526-DE-5	DE	11/5/2010	EP10190274A	EP2322796	9/26/2018	Systems and apparatus relating to solar-thermal power generation	Dolby Intellectual Property Licensing, LLC	Active
235526-EP-4	EP	11/5/2010	EP10190274A	EP2322796	9/26/2018	Systems and apparatus relating to solar-thermal power generation	Dolby Intellectual Property Licensing, LLC	Active
235526-US-1	US	11/16/2009	US12/619199	US8276379	10/2/2012	Systems and apparatus relating to solar-thermal power generation	Dolby Intellectual Property Licensing, LLC	Active
235655-CH-3	CH	9/22/2010	EP10178461A	EP2306580	5/20/2015	Composition and energy storage device	Dolby Intellectual Property Licensing, LLC	Active
235655-DE-4	DE	9/22/2010	EP10178461A	EP2306580	5/20/2015	Composition and energy storage device	Dolby Intellectual Property Licensing, LLC	Active
235655-GB-5	GB	9/22/2010	EP10178461A	EP2306580	5/20/2015	Composition and energy storage device	Dolby Intellectual Property Licensing, LLC	Active
235655-IT-6	IT	9/22/2010	EP10178461A	EP2306580	5/20/2015	Composition and energy storage device	Dolby Intellectual Property Licensing, LLC	Active
235655-US-1	US	9/24/2009	US12/565842	US8178231	5/15/2012	Composition and energy storage device	Dolby Intellectual Property Licensing, LLC	Active
235714-US-1	US	11/4/2009	US12/611993	US8343661	1/1/2013	Cathode compositions comprising zn and chalcogenide and energy storage cell comprising same	Dolby Intellectual Property Licensing, LLC	Active
235738-US-1	US	9/29/2010	US12/893661	US8329336	12/11/2012	Composition and energy storage device	Dolby Intellectual Property Licensing, LLC	Active
235783-AU-8	AU	5/28/2015	AU201520290 2A	AU2015202 902	9/8/2016	Protective coating compositions and devices	Dolby Intellectual Property Licensing, LLC	Active
235783-CN-3	CN	7/23/2010	CN201010245 418A	CN10203104 5	2/18/2015	Protective coating compositions and devices	Dolby Intellectual Property Licensing, LLC	Active
235783-DE-5	DE	7/20/2010	EP10170065A	EP2302006	11/28/2012	Protective coating compositions and devices	Dolby Intellectual Property Licensing, LLC	Active
235783-ES-6	ES	7/20/2010	EP10170065A	EP2302006	11/28/2012	Protective coating compositions and devices	Dolby Intellectual Property Licensing, LLC	Active
235783-IT-7	IT	7/20/2010	EP10170065A	EP2302006	11/28/2012	Protective coating compositions and devices	Dolby Intellectual Property Licensing, LLC	Active
235783-US-1	US	9/25/2009	US12/566962	US8216357	7/10/2012	Protective coating compositions and devices	Dolby Intellectual Property Licensing, LLC	Active
235849-AU-2	AU	12/2/2010	AU201024913 9A	AU2010249 139	11/5/2015	Method and apparatus for switching electrical power	Dolby Intellectual Property Licensing, LLC	Active
235849-BR-3	BR	11/30/2010	BRPI1004671 A	BRPI100467 1	11/5/2019	Current control device and service meter	Dolby Intellectual Property Licensing, LLC	Active
235849-CA-4	CA	11/26/2010	CA2722635A	CA2722635	6/5/2018	Method and apparatus for switching electrical power	Dolby Intellectual Property Licensing, LLC	Active

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235849-DE-9	DE	11/30/2010	EP10193206A	EP2330384	3/27/2019	Method and apparatus for switching electrical power	Dolby Intellectual Property Licensing, LLC	Active
235849-EP-5	EP	11/30/2010	EP10193206A	EP2330384	3/27/2019	Method and apparatus for switching electrical power	Dolby Intellectual Property Licensing, LLC	Active
235849-FR-8	FR	11/30/2010	EP10193206A	EP2330384	3/27/2019	Method and apparatus for switching electrical power	Dolby Intellectual Property Licensing, LLC	Active
235849-GB-10	GB	11/30/2010	EP10193206A	EP2330384	3/27/2019	Method and apparatus for switching electrical power	Dolby Intellectual Property Licensing, LLC	Active
235849-JP-6	JP	12/1/2010	JP2010268225A	JP5809797	11/11/2015	Method and apparatus for switching power	Dolby Intellectual Property Licensing, LLC	Active
235849-NZ-7	NZ	12/2/2010	NZ58966210A	NZ589662	11/30/2012	Current control device including a mems switch coupled between line and load sockets	Dolby Intellectual Property Licensing, LLC	Active
235849-US-1	US	12/2/2009	US12/629309	US8916995	12/23/2014	Method and apparatus for switching electrical power	Dolby Intellectual Property Licensing, LLC	Active
235896-US-1	US	4/30/2010	US12/771907	US8248755	8/21/2012	Polyimides and thin films, electronic articles and capacitors comprising these, and methods of making them	Dolby Intellectual Property Licensing, LLC	Active
236086-US-1	US	12/18/2009	US12/642501	US8753711	6/17/2014	Edge sealing method using barrier coatings	Dolby Intellectual Property Licensing, LLC	Active
236088-US-1	US	10/12/2009	US12/577629	US9472783	10/18/2016	Barrier coating with reduced process time	Dolby Intellectual Property Licensing, LLC	Active
236159-US-1	US	2/24/2010	US12/711556	US8652689	2/18/2014	Energy storage device and system	Dolby Intellectual Property Licensing, LLC	Active
236639-US-1	US	8/31/2009	US12/551410	US8124299	2/28/2012	Methods for using optical data storage media	Dolby Intellectual Property Licensing, LLC	Active
236639-US-7	US	2/27/2012	US13/405681	US8703388	4/22/2014	Optical data storage media	Dolby Intellectual Property Licensing, LLC	Active
236909-CN-2	CN	7/9/2010	CN201010231262A	CN101958651	6/19/2013	Transformer on-load tap changer using mems technology	Dolby Intellectual Property Licensing, LLC	Active
236909-JP-4	JP	7/7/2010	JP2010154403A	JP5237994	7/17/2013	Transformer tap changer using mems technology	Dolby Intellectual Property Licensing, LLC	Active
236909-US-1	US	7/9/2009	US12/500212	US8203319	6/19/2012	Transformer on-load tap changer using mems technology	Dolby Intellectual Property Licensing, LLC	Active
236987-US-1	US	3/24/2010	US12/730496	US9368774	6/14/2016	Electrolyte separator and method of making the electrolyte separator	Dolby Intellectual Property Licensing, LLC	Active
237446-US-2	US	1/27/2010	US12/694840	US8406487	3/26/2013	Method and system for contactless fingerprint detection and verification	Dolby Intellectual Property Licensing, LLC	Active
237714-CN-3	CN	3/31/2011	CN201110093474A	CN102208816	8/19/2015	Control distribution transformer and manufacture method thereof	Dolby Intellectual Property Licensing, LLC	Active
237714-DE-9	DE	3/28/2011	EP11160074A	EP2434614	6/19/2013	Distribution transformer transmitting control signals and method of making same	Dolby Intellectual Property Licensing, LLC	Active
237714-FR-10	FR	3/28/2011	EP11160074A	EP2434614	6/19/2013	Distribution transformer transmitting control signals and method of making same	Dolby Intellectual Property Licensing, LLC	Active
237714-IN-5	IN	3/15/2011	IN722DE2011A	IN341301	7/17/2020	Control distribution transformer and method making same	Dolby Intellectual Property Licensing, LLC	Active
237714-JP-6	JP	3/24/2011	JP2011065109A	JP5735828	6/17/2015	System with distribution transformer including communication module	Dolby Intellectual Property Licensing, LLC	Active
237714-US-1	US	3/31/2010	US12/751098	US8102148	1/24/2012	Augmented distribution transformer and method of making same	Dolby Intellectual Property Licensing, LLC	Active

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237714-US-2	US	3/31/2010	US12/751151	US8340833	12/25/2012	Control distribution transformer and method of making same	Dolby Intellectual Property Licensing, LLC	Active
237714-US-7	US	11/28/2011	US13/304989	US8423196	4/16/2013	Augmented distribution transformer and method of making same	Dolby Intellectual Property Licensing, LLC	Active
237714-US-8	US	12/21/2012	US13/723726	US9263182	2/16/2016	Control distribution transformer and method of making same	Dolby Intellectual Property Licensing, LLC	Active
237735-US-1	US	8/28/2009	US12/549839	US8766642	7/1/2014	Electrochemical cell	Dolby Intellectual Property Licensing, LLC	Active
237851-CN-2	CN	3/31/2011	CN201110093490A	CN102205844	8/17/2016	Equipment and manufacture method thereof for combination drive direct torque	Dolby Intellectual Property Licensing, LLC	Active
237851-DE-6	DE	3/28/2011	EP11160077A	EP2371646	11/29/2017	Apparatus for hybrid drive torque control	Dolby Intellectual Property Licensing, LLC	Active
237851-ES-10	ES	3/28/2011	EP11160077A	EP2371646	11/29/2017	Apparatus for hybrid drive torque control	Dolby Intellectual Property Licensing, LLC	Active
237851-FR-7	FR	3/28/2011	EP11160077A	EP2371646	11/29/2017	Apparatus for hybrid drive torque control	Dolby Intellectual Property Licensing, LLC	Active
237851-GB-8	GB	3/28/2011	EP11160077A	EP2371646	11/29/2017	Apparatus for hybrid drive torque control	Dolby Intellectual Property Licensing, LLC	Active
237851-IN-4	IN	3/15/2011	IN723DE2011A	IN388101	2/4/2022	Apparatus for hybrid drive torque control and method of	Dolby Intellectual Property Licensing, LLC	Active
237851-IT-9	IT	3/28/2011	EP11160077A	EP2371646	11/29/2017	Apparatus for hybrid drive torque control	Dolby Intellectual Property Licensing, LLC	Active
237851-JP-5	JP	3/24/2011	JP2011065108A	JP6389025	9/12/2018	Device for torque control of hybrid drive	Dolby Intellectual Property Licensing, LLC	Active
237851-US-1	US	3/31/2010	US12/751612	US9145048	9/29/2015	Apparatus for hybrid engine control and method of manufacture same	Dolby Intellectual Property Licensing, LLC	Active
237934-DE-5	DE	8/3/2010	EP10171761A	EP2287915	1/9/2013	Fused wiring harness for a photovoltaic system	Dolby Intellectual Property Licensing, LLC	Active
237934-ES-6	ES	8/3/2010	EP10171761A	EP2287915	1/9/2013	Fused wiring harness for a photovoltaic system	Dolby Intellectual Property Licensing, LLC	Active
237934-IT-7	IT	8/3/2010	EP10171761A	EP2287915	1/9/2013	Fused wiring harness for a photovoltaic system	Dolby Intellectual Property Licensing, LLC	Active
237954-CN-2	CN	2/25/2011	CN201110051953A	CN102189994	9/7/2016	For the electronic and system and method for motor vehicle driven by mixed power operation	Dolby Intellectual Property Licensing, LLC	Active
237954-DE-7	DE	1/25/2011	EP11152128A	EP2368751	6/14/2023	System and method for operation of electric and hybrid vehicles	Dolby Intellectual Property Licensing, LLC	Active
237954-EP-3	EP	1/25/2011	EP11152128A	EP2368751	6/14/2023	System and method for operation of electric and hybrid vehicles	Dolby Intellectual Property Licensing, LLC	Active
237954-FR-6	FR	1/25/2011	EP11152128A	EP2368751	6/14/2023	System and method for operation of electric and hybrid vehicles	Dolby Intellectual Property Licensing, LLC	Active
237954-GB-8	GB	1/25/2011	EP11152128A	EP2368751	6/14/2023	System and method for operation of electric and hybrid vehicles	Dolby Intellectual Property Licensing, LLC	Active
237954-IN-4	IN	1/25/2011	IN180DE2011A	IN414523	12/16/2022	System and method for operation of electric and hybrid vehicles	Dolby Intellectual Property Licensing, LLC	Active
237954-JP-5	JP	1/25/2011	JP2011012494A	JP5859732	2/16/2016	Electric vehicle or hybrid vehicle operating system	Dolby Intellectual Property Licensing, LLC	Active
237954-US-1	US	3/9/2010	US12/719921	US8086364	12/27/2011	System and method for operation of electric and hybrid vehicles	Dolby Intellectual Property Licensing, LLC	Active

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238115-CN-2	CN	1/13/2011	CN201110025103A	CN102131262	11/25/2015	Intelligence heterogeneous wireless switches	Dolby Intellectual Property Licensing, LLC	Active
238115-DE-8	DE	12/17/2010	EP10195582A	EP2346283	2/27/2019	Intelligent heterogeneous wireless handoff	Dolby Intellectual Property Licensing, LLC	Active
238115-EP-3	EP	12/17/2010	EP10195582A	EP2346283	2/27/2019	Intelligent heterogeneous wireless handoff	Dolby Intellectual Property Licensing, LLC	Active
238115-FR-7	FR	12/17/2010	EP10195582A	EP2346283	2/27/2019	Intelligent heterogeneous wireless handoff	Dolby Intellectual Property Licensing, LLC	Active
238115-GB-9	GB	12/17/2010	EP10195582A	EP2346283	2/27/2019	Intelligent heterogeneous wireless handoff	Dolby Intellectual Property Licensing, LLC	Active
238115-KR-4	KR	1/14/2011	KR20110004110A	KR101734556	5/11/2017	Intelligent heterogeneous wireless handoff	Dolby Intellectual Property Licensing, LLC	Active
238115-US-1	US	1/14/2010	US12/687673	US9473999	10/18/2016	Intelligent heterogeneous wireless handoff	Dolby Intellectual Property Licensing, LLC	Active
238115-US-5	US	9/27/2016	US15/277630	US10064114	8/28/2018	Intelligent heterogeneous wireless handoff	Dolby Intellectual Property Licensing, LLC	Active
238115-US-6	US	8/6/2018	US16/056007	US10750420	8/18/2020	Intelligent heterogeneous wireless handoff	Dolby Intellectual Property Licensing, LLC	Active
238312-BR-3	BR	4/25/2011	BRPI1102023A	BRPI1102023	1/7/2020	Power transfer systems	Dolby Intellectual Property Licensing, LLC	Active
238312-BR-9	BR	4/26/2011	BRPI1101998A	BRPI1101998	12/17/2019	Energy transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-CN-10	CN	5/12/2011	CN201110134191A	CN102340185	5/20/2015	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-CN-4	CN	5/12/2011	CN201110134150A	CN102244417	6/17/2015	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-DE-20	DE	5/6/2011	EP11165079A	EP2392553	8/24/2016	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-DE-22	DE	5/6/2011	EP11165080A	EP2386531	11/9/2016	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-DE-25	DE	5/6/2011	EP16179677A	EP3116002	7/3/2019	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-EP-19	EP	5/6/2011	EP16179677A	EP3116002	7/3/2019	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-FR-21	FR	5/6/2011	EP11165079A	EP2392553	8/24/2016	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-FR-23	FR	5/6/2011	EP11165080A	EP2386531	11/9/2016	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-FR-24	FR	5/6/2011	EP16179677A	EP3116002	7/3/2019	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-IN-12	IN	4/28/2011	IN1254DE2011A	IN298303	7/6/2018	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-IN-6	IN	4/27/2011	IN1246DE2011A	IN412645	12/2/2022	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-JP-13	JP	5/9/2011	JP2011103929A	JP5813364	11/17/2015	Dielectric materials for power transmission systems	Dolby Intellectual Property Licensing, LLC	Active
238312-JP-7	JP	5/9/2011	JP2011103930A	JP5802050	10/28/2015	Dielectric materials for power transmission systems	Dolby Intellectual Property Licensing, LLC	Active

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238312-SG-14	SG	5/12/2011	SG2011034204A	SG176378	12/29/2011	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-SG-17	SG	11/5/2013	201308204-5	N/A	5/9/2017		Dolby Intellectual Property Licensing, LLC	Active
238312-SG-18	SG	11/4/2013	201308177-3	N/A	6/14/2017		Dolby Intellectual Property Licensing, LLC	Active
238312-US-1	US	5/12/2010	US12/778166	US9174876	11/3/2015	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238312-US-15	US	3/30/2011	US13/075911	US8968603	3/3/2015	Dielectric materials	Dolby Intellectual Property Licensing, LLC	Active
238312-US-16	US	3/30/2011	US13/075997	US8586495	11/19/2013	Dielectric materials	Dolby Intellectual Property Licensing, LLC	Active
238312-US-2	US	5/12/2010	US12/778189	US8968609	3/3/2015	Dielectric materials for power transfer system	Dolby Intellectual Property Licensing, LLC	Active
238320-US-1	US	3/19/2010	US12/727536	US8779726	7/15/2014	Control system and method for charging sealed batteries	Dolby Intellectual Property Licensing, LLC	Active
238346-CN-2	CN	8/17/2010	CN201010262686A	CN101995433	3/12/2014	Apparatus and method for bearing condition monitoring	Dolby Intellectual Property Licensing, LLC	Active
238346-JP-4	JP	8/13/2010	JP2010181183A	JP5693083	4/1/2015	Bearing state monitoring apparatus and method	Dolby Intellectual Property Licensing, LLC	Active
238346-US-1	US	8/17/2009	US12/542046	US8229682	7/24/2012	Apparatus and method for bearing condition monitoring	Dolby Intellectual Property Licensing, LLC	Active
238407-US-1	US	8/31/2009	US12/550521	US8182967	5/22/2012	Optical data storage media and methods for using the same	Dolby Intellectual Property Licensing, LLC	Active
238407-US-7	US	12/14/2010	US12/967409	US8178261	5/15/2012	Optical data storage media and methods for using the same	Dolby Intellectual Property Licensing, LLC	Active
238413-CN-2	CN	2/1/2011	CN201110062345A	CN102158917	6/8/2016	Switching between different vocoder systems	Dolby Intellectual Property Licensing, LLC	Active
238413-KR-4	KR	2/1/2011	KR20110009998A	KR101256316	4/18/2013	Handoffs between different voice encoder systems	Dolby Intellectual Property Licensing, LLC	Active
238413-US-1	US	2/3/2010	US12/699699	US8521520	8/27/2013	Handoffs between different voice encoder systems	Dolby Intellectual Property Licensing, LLC	Active
238414-CN-2	CN	3/10/2011	CN201110064382A	CN102195806	8/17/2016	Switching for many transmission technologys is measured	Dolby Intellectual Property Licensing, LLC	Active
238414-KR-4	KR	3/10/2011	KR20110021549A	KR101787754	10/18/2017	Handoff metric for multiple transmission technologies	Dolby Intellectual Property Licensing, LLC	Active
238414-US-1	US	3/10/2010	US12/721359	US8315630	11/20/2012	Handoff metric for multiple transmission technologies	Dolby Intellectual Property Licensing, LLC	Active
238414-US-5	US	11/5/2012	US13/669253	US8688124	4/1/2014	Handoff metric for multiple transmission technologies	Dolby Intellectual Property Licensing, LLC	Active
238668-CN-2	CN	7/21/2011	CN201110280532A	CN102377333	5/13/2015	Apparatus and system for power conversion	Dolby Intellectual Property Licensing, LLC	Active
238668-DE-8	DE	7/13/2011	EP11173778A	EP2416479	5/1/2019	Apparatus and system for power conversion	Dolby Intellectual Property Licensing, LLC	Active
238668-EP-3	EP	7/13/2011	EP11173778A	EP2416479	5/1/2019	Apparatus and system for power conversion	Dolby Intellectual Property Licensing, LLC	Active
238668-IN-4	IN	7/14/2011	IN1975DE2011A	IN332567	2/28/2020	Apparatus for power conversion in a power electronic system	Dolby Intellectual Property Licensing, LLC	Active
238668-JP-5	JP	7/13/2011	JP2011154366A	JP6088126	3/1/2017	Apparatus and system for power conversion	Dolby Intellectual Property Licensing, LLC	Active

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238668-US-1	US	7/21/2010	US12/840423	US8310083	11/13/2012	Apparatus and system for power conversion	Dolby Intellectual Property Licensing, LLC	Active
238668-US-6	US	11/5/2012	US13/668660	US8541904	9/24/2013	Apparatus and system for power conversion	Dolby Intellectual Property Licensing, LLC	Active
238727-US-1	US	12/15/2009	US12/637797	US8377593	2/19/2013	Energy storage device	Dolby Intellectual Property Licensing, LLC	Active
238727-US-3	US	9/14/2012	US13/617232	US8530090	9/10/2013	Energy storage device	Dolby Intellectual Property Licensing, LLC	Active
238780-CN-2	CN	12/21/2011	CN201110463346A	CN102623221	12/7/2016	Compositions and manufacture method	Dolby Intellectual Property Licensing, LLC	Active
238780-DE-6	DE	12/14/2011	EP11193469A	EP2468928	1/26/2022	Manufacturing method	Dolby Intellectual Property Licensing, LLC	Active
238780-EP-3	EP	12/14/2011	EP11193469A	EP2468928	1/26/2022	Manufacturing method	Dolby Intellectual Property Licensing, LLC	Active
238780-JP-4	JP	12/16/2011	JP2011275135A	JP5872278	3/1/2016	Method of forming a microelectromechanical system device	Dolby Intellectual Property Licensing, LLC	Active
238780-KR-5	KR	12/20/2011	KR20110138516A	KR101983854	5/29/2019	Method of forming a micro-electromechanical system device	Dolby Intellectual Property Licensing, LLC	Active
238780-US-1	US	12/21/2010	US12/975090	US8826529	9/9/2014	Method of forming a micro-electromechanical system device	Dolby Intellectual Property Licensing, LLC	Active
238789-CN-2	CN	11/30/2010	CN201010586673A	CN102082043	9/23/2015	Construction of switch	Dolby Intellectual Property Licensing, LLC	Active
238789-DE-6	DE	11/19/2010	EP10191932A	EP2328160	2/28/2018	Switch structures	Dolby Intellectual Property Licensing, LLC	Active
238789-FI-8	FI	11/19/2010	EP10191932A	EP2328160	2/28/2018	Switch structures	Dolby Intellectual Property Licensing, LLC	Active
238789-FR-7	FR	11/19/2010	EP10191932A	EP2328160	2/28/2018	Switch structures	Dolby Intellectual Property Licensing, LLC	Active
238789-GB-9	GB	11/19/2010	EP10191932A	EP2328160	2/28/2018	Switch structures	Dolby Intellectual Property Licensing, LLC	Active
238789-IT-10	IT	11/19/2010	EP10191932A	EP2328160	2/28/2018	Switch structures	Dolby Intellectual Property Licensing, LLC	Active
238789-JP-4	JP	11/10/2010	JP2010251379A	JP5829804	12/9/2015	Switch structure	Dolby Intellectual Property Licensing, LLC	Active
238789-KR-5	KR	11/29/2010	KR20100119651A	KR101745725	6/9/2017	Switch structures	Dolby Intellectual Property Licensing, LLC	Active
238789-SE-11	SE	11/19/2010	EP10191932A	EP2328160	2/28/2018	Switch structures	Dolby Intellectual Property Licensing, LLC	Active
238789-US-1	US	11/30/2009	US12/627476	US8779886	7/15/2014	Switch structures	Dolby Intellectual Property Licensing, LLC	Active
238794-CN-2	CN	9/21/2010	CN201010500702A	CN102034648	6/25/2014	Switch structure and method	Dolby Intellectual Property Licensing, LLC	Active
238794-DE-6	DE	9/17/2010	EP10177345A	EP2315221	11/14/2012	Switch structure and method	Dolby Intellectual Property Licensing, LLC	Active
238794-FR-7	FR	9/17/2010	EP10177345A	EP2315221	11/14/2012	Switch structure and method	Dolby Intellectual Property Licensing, LLC	Active
238794-IT-9	IT	9/17/2010	EP10177345A	EP2315221	11/14/2012	Switch structure and method	Dolby Intellectual Property Licensing, LLC	Active

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238794-KR-5	KR	9/17/2010	KR20100091557A	KR101734547	5/11/2017	Switch structure and method	Dolby Intellectual Property Licensing, LLC	Active
238794-US-1	US	9/23/2009	US12/565127	US8354899	1/15/2013	Switch structure and method	Dolby Intellectual Property Licensing, LLC	Active
238894-CN-1	CN	11/2/2011	CN201110341544A	CN103094585	3/16/2016	Electrochemical cell	Dolby Intellectual Property Licensing, LLC	Active
238894-US-2	US	12/27/2012	US13/727666	US9159980	10/13/2015	Electrochemical cell	Dolby Intellectual Property Licensing, LLC	Active
239040-CN-2	CN	12/15/2010	CN201010616094A	CN102104280	5/18/2016	Use and share equipment and the method that power electronic devices is carried out quick charge	Dolby Intellectual Property Licensing, LLC	Active
239040-DE-7	DE	12/14/2010	EP10194998A	EP2337183	7/23/2014	Apparatus and method for rapid charging using shared power electronics	Dolby Intellectual Property Licensing, LLC	Active
239040-FR-8	FR	12/14/2010	EP10194998A	EP2337183	7/23/2014	Apparatus and method for rapid charging using shared power electronics	Dolby Intellectual Property Licensing, LLC	Active
239040-GB-9	GB	12/14/2010	EP10194998A	EP2337183	7/23/2014	Apparatus and method for rapid charging using shared power electronics	Dolby Intellectual Property Licensing, LLC	Active
239040-JP-4	JP	12/15/2010	JP2010278693A	JP5651456	1/14/2015	Rapid charging apparatus and method using shared electric and electronic equipment	Dolby Intellectual Property Licensing, LLC	Active
239040-US-1	US	12/18/2009	US12/641359	US8698451	4/15/2014	Apparatus and method for rapid charging using shared power electronics	Dolby Intellectual Property Licensing, LLC	Active
239040-US-10	US	9/14/2016	US15/265404	US9914365	3/13/2018	Apparatus and method for rapid charging using shared power electronics	Dolby Intellectual Property Licensing, LLC	Active
239040-US-11	US	9/19/2017	US15/708859	US10377259	8/13/2019	Apparatus and method for rapid charging using shared power electronics	Dolby Intellectual Property Licensing, LLC	Active
239040-US-12	US	2/18/2019	US16/278379	US10543755	1/28/2020	Apparatus and method for rapid charging using shared power electronics	Dolby Intellectual Property Licensing, LLC	Active
239040-US-13	US	12/16/2019	US16/715508	US11400820	8/2/2022	Apparatus and method for rapid charging using shared power electronics	Dolby Intellectual Property Licensing, LLC	Active
239040-US-15	US	10/31/2022	US17/977204	US11884168	1/30/2024	Apparatus and method for rapid charging using shared power electronics	Dolby Intellectual Property Licensing, LLC	Active
239040-US-6	US	3/19/2014	US14/219201	US9789780	10/17/2017	Apparatus and method for rapid charging using shared power electronics	Dolby Intellectual Property Licensing, LLC	Active
239053-CN-2	CN	4/8/2011	CN201110093550A	CN102215508	12/14/2016	Without dividing duplex network	Dolby Intellectual Property Licensing, LLC	Active
239053-DE-5	DE	4/4/2011	EP11160945A	EP2375620	6/8/2016	Division free duplexing networks	Dolby Intellectual Property Licensing, LLC	Active
239053-FI-6	FI	4/4/2011	EP11160945A	EP2375620	6/8/2016	Division free duplexing networks	Dolby Intellectual Property Licensing, LLC	Active
239053-FR-7	FR	4/4/2011	EP11160945A	EP2375620	6/8/2016	Division free duplexing networks	Dolby Intellectual Property Licensing, LLC	Active
239053-GB-8	GB	4/4/2011	EP11160945A	EP2375620	6/8/2016	Division free duplexing networks	Dolby Intellectual Property Licensing, LLC	Active
239053-KR-4	KR	4/8/2011	KR20110032639A	KR101836486	3/8/2018	Division free duplexing networks	Dolby Intellectual Property Licensing, LLC	Active
239053-LU-9	LU	4/4/2011	EP11160945A	EP2375620	6/8/2016	Division free duplexing networks	Dolby Intellectual Property Licensing, LLC	Active
239053-NL-10	NL	4/4/2011	EP11160945A	EP2375620	6/8/2016	Division free duplexing networks	Dolby Intellectual Property Licensing, LLC	Active

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239053-SE-11	SE	4/4/2011	EP11160945A	EP2375620	6/8/2016	Division free duplexing networks	Dolby Intellectual Property Licensing, LLC	Active
239053-US-1	US	4/9/2010	US12/757721	US9369260	6/14/2016	Division free duplexing networks	Dolby Intellectual Property Licensing, LLC	Active
239322-CN-2	CN	8/27/2010	CN201010272850A	CN102006006	10/2/2013	System and method for non-sinusoidal current waveform excitation of electrical machines	Dolby Intellectual Property Licensing, LLC	Active
239322-DE-6	DE	8/20/2010	EP10173623A	EP2290810	6/25/2014	System and method for non-sinusoidal current waveform excitation of electrical machines	Dolby Intellectual Property Licensing, LLC	Active
239322-FR-7	FR	8/20/2010	EP10173623A	EP2290810	6/25/2014	System and method for non-sinusoidal current waveform excitation of electrical machines	Dolby Intellectual Property Licensing, LLC	Active
239322-GB-8	GB	8/20/2010	EP10173623A	EP2290810	6/25/2014	System and method for non-sinusoidal current waveform excitation of electrical machines	Dolby Intellectual Property Licensing, LLC	Active
239322-IN-4	IN	8/13/2010	IN1912DE2010A	IN424264	3/10/2023	System and method for nonsinusoidial current waveform	Dolby Intellectual Property Licensing, LLC	Active
239322-JP-5	JP	8/24/2010	JP2010186779A	JP5674383	2/25/2015	System and method for exciting an electrical machine with an unrestricted current waveform	Dolby Intellectual Property Licensing, LLC	Active
239322-US-1	US	8/28/2009	US12/549437	US8222855	7/17/2012	System and method for non-sinusoidal current waveform excitation of electrical machines	Dolby Intellectual Property Licensing, LLC	Active
239382-CN-12	CN	6/29/2011	CN201510490106A	CN105006935	11/17/2017	The system and method for the non-sinusoidal current waveform stimulus of generator	Dolby Intellectual Property Licensing, LLC	Active
239382-CN-2	CN	6/29/2011	CN201110191425A	CN102315811	9/16/2015	The system and method for the non-sinusoidal current waveform stimulus of generator	Dolby Intellectual Property Licensing, LLC	Active
239382-DE-6	DE	6/22/2011	EP11170924A	EP2403129	8/13/2014	System and method for non-sinusoidal current waveform excitation of electrical generators	Dolby Intellectual Property Licensing, LLC	Active
239382-FR-7	FR	6/22/2011	EP11170924A	EP2403129	8/13/2014	System and method for non-sinusoidal current waveform excitation of electrical generators	Dolby Intellectual Property Licensing, LLC	Active
239382-GB-8	GB	6/22/2011	EP11170924A	EP2403129	8/13/2014	System and method for non-sinusoidal current waveform excitation of electrical generators	Dolby Intellectual Property Licensing, LLC	Active
239382-IN-4	IN	6/13/2011	IN1672DE2011A	IN413958	12/9/2022	System and method for non-sinusoidal current waveform	Dolby Intellectual Property Licensing, LLC	Active
239382-IT-10	IT	6/22/2011	EP11170924A	EP2403129	8/13/2014	System and method for non-sinusoidal current waveform excitation of electrical generators	Dolby Intellectual Property Licensing, LLC	Active
239382-SE-9	SE	6/22/2011	EP11170924A	EP2403129	8/13/2014	System and method for non-sinusoidal current waveform excitation of electrical generators	Dolby Intellectual Property Licensing, LLC	Active
239382-US-1	US	6/29/2010	US12/826076	US8901896	12/2/2014	System and method for non-sinusoidal current waveform excitation of electrical generators	Dolby Intellectual Property Licensing, LLC	Active
239382-US-11	US	11/19/2014	US14/547315	US9118271	8/25/2015	System and method for non-sinusoidal current waveform excitation of electrical generators	Dolby Intellectual Property Licensing, LLC	Active
239428-CN-2	CN	8/11/2010	CN201010260530A	CN101992678	7/30/2014	System for multiple energy storage and management and method of making same	Dolby Intellectual Property Licensing, LLC	Active
239428-DE-7	DE	7/27/2010	EP10170852A	EP2284037	10/11/2023	System for multiple energy storage and management and method of making same	Dolby Intellectual Property Licensing, LLC	Active
239428-EP-3	EP	7/27/2010	EP10170852A	EP2284037	10/11/2023	System for multiple energy storage and management and method of making same	Dolby Intellectual Property Licensing, LLC	Active
239428-IN-4	IN	7/28/2010	IN1764DE2010A	IN327160	12/13/2019	System for multiple energy storage and management and	Dolby Intellectual Property Licensing, LLC	Active
239428-JP-5	JP	8/9/2010	JP2010178267A	JP5674379	2/25/2015	System for storing and managing a plurality of energies and method for producing the same	Dolby Intellectual Property Licensing, LLC	Active

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239428-US-1	US	8/11/2009	US12/539056	US8026638	9/27/2011	System for multiple energy storage and management and method of making same	Dolby Intellectual Property Licensing, LLC	Active
239428-US-6	US	9/2/2011	US13/224669	US8922057	12/30/2014	System for multiple energy storage and management and method of making same	Dolby Intellectual Property Licensing, LLC	Active
239449-CN-3	CN	8/31/2010	CN201010277436A	CN102005789	4/15/2015	Apparatus for transferring energy using onboard power electronics and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
239449-DE-9	DE	8/25/2010	EP10174013A	EP2290778	4/7/2021	Apparatus for transferring energy using onboard power electronics	Dolby Intellectual Property Licensing, LLC	Active
239449-EP-4	EP	8/25/2010	EP10174013A	EP2290778	4/7/2021	Apparatus for transferring energy using onboard power electronics	Dolby Intellectual Property Licensing, LLC	Active
239449-JP-6	JP	8/31/2010	JP2010193001A	JP6068778	1/25/2017	Device for transmitting energy using in-vehicle power electronics and method of manufacturing the same	Dolby Intellectual Property Licensing, LLC	Active
239449-JP-8	JP	11/26/2015	JP2015230270A	JP6228586	11/8/2017	Electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
239449-US-1	US	8/31/2009	US12/550504	US8030884	10/4/2011	Apparatus for transferring energy using onboard power electronics and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
239449-US-2	US	8/31/2009	US12/550536	US8421271	4/16/2013	Apparatus for transferring energy using onboard power electronics and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
239449-US-7	US	5/2/2011	US13/099053	US8487582	7/16/2013	Apparatus for transferring energy using onboard power electronics and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
239451-CN-12	CN	7/22/2011	CN201610626550A	CN106067712	1/22/2019	High power density, high efficiency, non-permanent magnet motor	Dolby Intellectual Property Licensing, LLC	Active
239451-CN-2	CN	7/22/2011	CN201110218620A	CN102347648	8/31/2016	High power density, high efficiency, non-permanent magnet motor	Dolby Intellectual Property Licensing, LLC	Active
239451-DE-7	DE	7/14/2011	EP11173959A	EP2410639	6/11/2014	High power-density, high efficiency, non-permanent magnet electric machine	Dolby Intellectual Property Licensing, LLC	Active
239451-FR-8	FR	7/14/2011	EP11173959A	EP2410639	6/11/2014	High power-density, high efficiency, non-permanent magnet electric machine	Dolby Intellectual Property Licensing, LLC	Active
239451-GB-9	GB	7/14/2011	EP11173959A	EP2410639	6/11/2014	High power-density, high efficiency, non-permanent magnet electric machine	Dolby Intellectual Property Licensing, LLC	Active
239451-IN-4	IN	7/6/2011	IN191ZDE2011A	IN334754	3/20/2020	Non-permanent magnet electric machine having high	Dolby Intellectual Property Licensing, LLC	Active
239451-IT-10	IT	7/14/2011	EP11173959A	EP2410639	6/11/2014	High power-density, high efficiency, non-permanent magnet electric machine	Dolby Intellectual Property Licensing, LLC	Active
239451-JP-5	JP	7/21/2011	JP2011159450A	JP5877968	3/8/2016	High power density, high efficiency, non-permanent magnet electric machine	Dolby Intellectual Property Licensing, LLC	Active
239451-SE-11	SE	7/14/2011	EP11173959A	EP2410639	6/11/2014	High power-density, high efficiency, non-permanent magnet electric machine	Dolby Intellectual Property Licensing, LLC	Active
239451-US-1	US	7/23/2010	US12/842142	US8310115	11/13/2012	High power-density, high efficiency, non-permanent magnet electric machine	Dolby Intellectual Property Licensing, LLC	Active
239451-US-6	US	9/7/2012	US13/606080	US8587164	11/19/2013	High power-density, high efficiency, non-permanent magnet electric machine	Dolby Intellectual Property Licensing, LLC	Active
241038-CN-2	CN	1/4/2012	CN201210012987A	CN102594222	12/14/2016	Power switch system including mems (mems) array	Dolby Intellectual Property Licensing, LLC	Active

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241038-DE-6	DE	12/22/2011	EP11195092A	EP2472717	11/20/2019	Power switching system including a micro-electromechanical system (mems) array	Dolby Intellectual Property Licensing, LLC	Active
241038-EP-3	EP	12/22/2011	EP11195092A	EP2472717	11/20/2019	Power switching system including a micro-electromechanical system (mems) array	Dolby Intellectual Property Licensing, LLC	Active
241038-KR-5	KR	1/4/2012	KR20120000807A	KR101848096	5/28/2018	Power switching system including a micro-electromechanical system(mems) array	Dolby Intellectual Property Licensing, LLC	Active
241038-US-1	US	1/4/2011	US12/984338	US8350509	1/8/2013	Power switching system including a micro-electromechanical system (mems) array	Dolby Intellectual Property Licensing, LLC	Active
241238-US-1	US	8/29/2011	US13/219779	US8740793	6/3/2014	Radar based systems and methods for monitoring a subject	Dolby Intellectual Property Licensing, LLC	Active
241400-US-1	US	4/21/2010	US12/764765	US8453032	5/28/2013	Energy and space efficient detection for data storage	Dolby Intellectual Property Licensing, LLC	Active
241407-CN-2	CN	4/14/2011	CN201110102152A	CN102223643	10/21/2015	Use general method and communication system without dividing duplex	Dolby Intellectual Property Licensing, LLC	Active
241407-DE-5	DE	4/11/2011	EP11161812A	EP2378731	3/30/2016	Communication method for cognitive radio	Dolby Intellectual Property Licensing, LLC	Active
241407-FI-7	FI	4/11/2011	EP11161812A	EP2378731	3/30/2016	Communication method for cognitive radio	Dolby Intellectual Property Licensing, LLC	Active
241407-FR-6	FR	4/11/2011	EP11161812A	EP2378731	3/30/2016	Communication method for cognitive radio	Dolby Intellectual Property Licensing, LLC	Active
241407-GB-8	GB	4/11/2011	EP11161812A	EP2378731	3/30/2016	Communication method for cognitive radio	Dolby Intellectual Property Licensing, LLC	Active
241407-KR-4	KR	4/14/2011	KR20110034664A	KR101889551	8/17/2018	Generalized division free duplexing techniques for decreasing rendevous time	Dolby Intellectual Property Licensing, LLC	Active
241407-LU-9	LU	4/11/2011	EP11161812A	EP2378731	3/30/2016	Communication method for cognitive radio	Dolby Intellectual Property Licensing, LLC	Active
241407-NL-10	NL	4/11/2011	EP11161812A	EP2378731	3/30/2016	Communication method for cognitive radio	Dolby Intellectual Property Licensing, LLC	Active
241407-SE-11	SE	4/11/2011	EP11161812A	EP2378731	3/30/2016	Communication method for cognitive radio	Dolby Intellectual Property Licensing, LLC	Active
241407-US-1	US	4/15/2010	US12/761129	US8379584	2/19/2013	Generalized division free duplexing techniques for decreasing rendevous time	Dolby Intellectual Property Licensing, LLC	Active
241411-CN-2	CN	3/22/2011	CN201110080204A	CN102324943	8/3/2016	Dynamic and configurable sensor chassis	Dolby Intellectual Property Licensing, LLC	Active
241497-US-1	US	12/16/2009	US12/639060	US8054589	11/8/2011	Switch structure and associated circuit	Dolby Intellectual Property Licensing, LLC	Active
241504-US-1	US	11/13/2009	US12/617986	US8338055	12/25/2012	System and method for electrochemical energy conversion and storage	Dolby Intellectual Property Licensing, LLC	Active
241826-CN-2	CN	2/25/2011	CN201110045577A	CN102170185	1/6/2016	For the rotor structure of interior permanent magnet electromotive machine	Dolby Intellectual Property Licensing, LLC	Active
241826-IN-4	IN	2/17/2011	IN414DE2011A	IN328880	1/10/2020	Rotor structure for interior permanent magnet	Dolby Intellectual Property Licensing, LLC	Active
241826-US-1	US	2/26/2010	US12/713242	US8541919	9/24/2013	Rotor structure for interior permanent magnet electromotive machine including laminations profiled along a segment of a bridge to define a concave and curved bridge profile	Dolby Intellectual Property Licensing, LLC	Active
241843-CN-2	CN	6/17/2011	CN201110175517A	CN102394199	11/25/2015	There is the mems switch array being arranged to the substrate conducting switching current	Dolby Intellectual Property Licensing, LLC	Active

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241843-DE-5	DE	6/14/2011	EP11169822A	EP2398028	8/12/2015	Mems switching array having a substrate arranged to conduct switching current	Dolby Intellectual Property Licensing, LLC	Active
241843-JP-4	JP	6/10/2011	JP2011129654A	JP5802060	10/28/2015	Mems switching array having a substrate configured to conduct switching current	Dolby Intellectual Property Licensing, LLC	Active
241843-US-1	US	6/17/2010	US12/817578	US8576029	11/5/2013	Mems switching array having a substrate arranged to conduct switching current	Dolby Intellectual Property Licensing, LLC	Active
242316-US-1	US	6/6/2011	US13/154231	US9030921	5/12/2015	Increased spectral efficiency and reduced synchronization delay with bundled transmissions	Dolby Intellectual Property Licensing, LLC	Active
242316-US-2	US	4/7/2015	US14/680805	US9355670	5/31/2016	Increased spectral efficiency and reduced synchronization delay with bundled transmissions	Dolby Intellectual Property Licensing, LLC	Active
242399-CN-3	CN	5/27/2011	CN201110161393A	CN102263466	1/6/2016	Motor rotor conducting bar and manufacture method thereof	Dolby Intellectual Property Licensing, LLC	Active
242399-DE-8	DE	5/25/2011	EP11167545A	EP2390987	5/4/2022	Electric machine rotor bar and method of making same	Dolby Intellectual Property Licensing, LLC	Active
242399-EP-4	EP	5/25/2011	EP11167545A	EP2390987	5/4/2022	Electric machine rotor bar and method of making same	Dolby Intellectual Property Licensing, LLC	Active
242399-IN-5	IN	5/12/2011	IN1405DE2011A	IN423284	3/3/2023	Electric machine rotor bar and method of making same	Dolby Intellectual Property Licensing, LLC	Active
242399-JP-2	JP	5/18/2011	JP2011110894A	JP5997880	9/28/2016	Electric machine rotor bar and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
242399-JP-7	JP	10/28/2015	JP2015211574A	JP6106246	3/29/2017	Electric machine rotor bar and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
242399-US-1	US	5/28/2010	US12/789580	US8274190	9/25/2012	Electric machine rotor bar and method of making same	Dolby Intellectual Property Licensing, LLC	Active
242399-US-6	US	7/23/2012	US13/555363	US9438077	9/6/2016	Electric machine rotor bar and method of making same	Dolby Intellectual Property Licensing, LLC	Active
242485-CH-9	CH	3/16/2012	EP12712027A	EP2688643	3/13/2019	System and method for contactless power transfer in implantable devices	Dolby Intellectual Property Licensing, LLC	Active
242485-CN-5	CN	3/16/2012	CN201280014305A	CN103517735	1/20/2016	For the system and method for non-contact power transfer in implantable device	Dolby Intellectual Property Licensing, LLC	Active
242485-DE-8	DE	3/16/2012	EP12712027A	EP2688643	3/13/2019	System and method for contactless power transfer in implantable devices	Dolby Intellectual Property Licensing, LLC	Active
242485-EP-3	EP	3/16/2012	EP12712027A	EP2688643	3/13/2019	System and method for contactless power transfer in implantable devices	Dolby Intellectual Property Licensing, LLC	Active
242485-FR-7	FR	3/16/2012	EP12712027A	EP2688643	3/13/2019	System and method for contactless power transfer in implantable devices	Dolby Intellectual Property Licensing, LLC	Active
242485-JP-4	JP	3/16/2012	JP2014501153A	JP5990252	9/7/2016	System and method for contactless power transfer in an implantable device	Dolby Intellectual Property Licensing, LLC	Active
242485-KR-6	KR	3/16/2012	KR20137024950A	KR102013964	8/23/2019	System and method for contactless power transfer in implantable devices	Dolby Intellectual Property Licensing, LLC	Active
242485-US-1	US	3/21/2011	US13/052196	US8849402	9/30/2014	System and method for contactless power transfer in implantable devices	Dolby Intellectual Property Licensing, LLC	Active
242491-CN-3	CN	12/19/2012	CN201210553324A	CN103177742	6/20/2017	For the method and system decoded to data	Dolby Intellectual Property Licensing, LLC	Active
242491-CN-8	CN	12/19/2012	CN201210553273A	CN103177741	3/13/2018	For the method and system decoded to data	Dolby Intellectual Property Licensing, LLC	Active
242491-DE-14	DE	12/11/2012	EP12196532A	EP2608204	7/15/2020	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active

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242491-DE-18	DE	12/11/2012	EP12196490A	EP2608203	6/24/2020	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-EP-4	EP	12/11/2012	EP12196532A	EP2608204	7/15/2020	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-EP-9	EP	12/11/2012	EP12196490A	EP2608203	6/24/2020	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-FR-13	FR	12/11/2012	EP12196532A	EP2608204	7/15/2020	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-FR-17	FR	12/11/2012	EP12196490A	EP2608203	6/24/2020	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-GB-16	GB	12/11/2012	EP12196532A	EP2608204	7/15/2020	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-GB-20	GB	12/11/2012	EP12196490A	EP2608203	6/24/2020	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-JP-10	JP	12/12/2012	JP2012270873A	JP6169842	7/26/2017	Method and system for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-JP-5	JP	12/12/2012	JP2012270874A	JP6138474	5/31/2017	Method and system for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-KR-11	KR	12/20/2012	KR20120149043A	KR101995592	7/2/2019	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-KR-6	KR	12/20/2012	KR20120149061A	KR102002649	7/22/2019	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-NL-15	NL	12/11/2012	EP12196532A	EP2608204	7/15/2020	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-NL-19	NL	12/11/2012	EP12196490A	EP2608203	6/24/2020	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-TW-12	TW	12/18/2012	TW101148138A	TWI588822	6/21/2017	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-TW-7	TW	12/18/2012	TW101148141A	TWI597722	9/1/2017	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-US-1	US	12/20/2011	US13/331625	US8493246	7/23/2013	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242491-US-2	US	12/20/2011	US13/331708	US8493247	7/23/2013	Methods and systems for decoding data	Dolby Intellectual Property Licensing, LLC	Active
242643-CN-2	CN	4/5/2012	CN201210107782A	CN102730620	12/14/2016	For improving the system and method for mems device reliability	Dolby Intellectual Property Licensing, LLC	Active
242643-DE-3	DE	3/29/2012	DE102012102727A	DE102012102727	5/17/2023	Systems and methods for increasing operational reliability of mems devices	Dolby Intellectual Property Licensing, LLC	Active
242643-US-1	US	3/31/2011	US13/077704	US8638093	1/28/2014	Systems and methods for enhancing reliability of mems devices	Dolby Intellectual Property Licensing, LLC	Active
242864-BR-2	BR	11/4/2011	BRPI1104811A	BRPI1104811	8/3/2021	Energy and storage control system	Dolby Intellectual Property Licensing, LLC	Active
242864-CN-3	CN	11/7/2011	CN201110381828A	CN102452325	9/16/2015	For to the equipment of electric vehicle charging and method	Dolby Intellectual Property Licensing, LLC	Active
242864-CN-7	CN	11/7/2011	CN201510494062A	CN105034830	4/6/2018	For the apparatus and method to electric vehicle charging	Dolby Intellectual Property Licensing, LLC	Active
242864-DE-12	DE	11/1/2011	EP11187387A	EP2450221	8/18/2021	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active

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242864-DE-19	DE	11/1/2011	EP21191611A	EP3981638	12/27/2023	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-EP-17	EP	11/1/2011	EP21191611A	EP3981638	12/27/2023	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-EP-4	EP	11/1/2011	EP11187387A	EP2450221	8/18/2021	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-ES-14	ES	11/1/2011	EP11187387A	EP2450221	8/18/2021	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-ES-22	ES	11/1/2011	EP21191611A	EP3981638	12/27/2023	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-FR-11	FR	11/1/2011	EP11187387A	EP2450221	8/18/2021	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-FR-18	FR	11/1/2011	EP21191611A	EP3981638	12/27/2023	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-GB-16	GB	11/1/2011	EP11187387A	EP2450221	8/18/2021	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-GB-24	GB	11/1/2011	EP21191611A	EP3981638	12/27/2023	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-IN-5	IN	10/31/2011	IN3091DE2011A	IN426417	3/24/2023	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-IT-13	IT	11/1/2011	EP11187387A	EP2450221	8/18/2021	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-IT-20	IT	11/1/2011	EP21191611A	EP3981638	12/27/2023	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-JP-10	JP	7/2/2019	JP2019123413A	JP7051758	4/11/2022	The apparatus and method which charges an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-JP-6	JP	11/1/2011	JP2011239869A	JP5908254	4/26/2016	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-JP-8	JP	10/6/2015	JP2015198092A	JP6188090	8/30/2017	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-JP-9	JP	8/1/2017	JP2017148827A	JP6553133	7/31/2019	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-NL-21	NL	11/1/2011	EP21191611A	EP3981638	12/27/2023	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-TR-15	TR	11/1/2011	EP11187387A	EP2450221	8/18/2021	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-TR-23	TR	11/1/2011	EP21191611A	EP3981638	12/27/2023	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242864-US-1	US	11/5/2010	US12/940085	US8378623	2/19/2013	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
242903-CH-5	CH	10/31/2011	EP11187315A	EP2450927	1/4/2017	Mems-based switching systems	Dolby Intellectual Property Licensing, LLC	Active
242903-CN-2	CN	11/3/2011	CN201110365774A	CN102545136	5/18/2016	Based on the switching system of mems	Dolby Intellectual Property Licensing, LLC	Active
242903-DE-6	DE	10/31/2011	EP11187315A	EP2450927	1/4/2017	Mems-based switching systems	Dolby Intellectual Property Licensing, LLC	Active
242903-FI-8	FI	10/31/2011	EP11187315A	EP2450927	1/4/2017	Mems-based switching systems	Dolby Intellectual Property Licensing, LLC	Active

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242903-FR-7	FR	10/31/2011	EP11187315A	EP2450927	1/4/2017	Mems-based switching systems	Dolby Intellectual Property Licensing, LLC	Active
242903-GB-9	GB	10/31/2011	EP11187315A	EP2450927	1/4/2017	Mems-based switching systems	Dolby Intellectual Property Licensing, LLC	Active
242903-IT-10	IT	10/31/2011	EP11187315A	EP2450927	1/4/2017	Mems-based switching systems	Dolby Intellectual Property Licensing, LLC	Active
242903-JP-4	JP	10/31/2011	JP2011238092A	JP5806589	11/10/2015	Mems switching system	Dolby Intellectual Property Licensing, LLC	Active
242903-SE-11	SE	10/31/2011	EP11187315A	EP2450927	1/4/2017	Mems-based switching systems	Dolby Intellectual Property Licensing, LLC	Active
242903-US-1	US	11/4/2010	US12/940027	US8537507	9/17/2013	Mems-based switching systems	Dolby Intellectual Property Licensing, LLC	Active
243031-US-1	US	12/22/2011	US13/335175	US8842287	9/23/2014	System and method for auto-focusing in optical coherence tomography	Dolby Intellectual Property Licensing, LLC	Active
243227-US-1	US	10/27/2011	US13/283142	US9083024	7/14/2015	Stack design for na nicl battery	Dolby Intellectual Property Licensing, LLC	Active
243942-CN-3	CN	11/18/2011	CN201110385885A	CN102570967	7/6/2016	Low inductance, high efficiency induction machine and manufacture method thereof	Dolby Intellectual Property Licensing, LLC	Active
243942-IN-5	IN	9/19/2011	IN2708DE2011A	IN334026	3/13/2020	An electric drive system comprising an induction motor, a	Dolby Intellectual Property Licensing, LLC	Active
243942-US-1	US	11/19/2010	US12/949882	US9685900	6/20/2017	Low-inductance, high-efficiency induction machine and method of making same	Dolby Intellectual Property Licensing, LLC	Active
243944-BR-2	BR	11/17/2011	BRPI1104890A	BRPI1104890	12/8/2020	Electrical control system	Dolby Intellectual Property Licensing, LLC	Active
243944-CN-3	CN	11/18/2011	CN201110457017A	CN102545774	3/30/2018	High power density, high back-emf magneto and its manufacture method	Dolby Intellectual Property Licensing, LLC	Active
243944-CN-9	CN	11/18/2011	CN201810153887A	CN108306573	4/12/2022	High power density, high anti emf permanent magnet motor and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
243944-DE-11	DE	11/15/2011	EP11189127A	EP2456065	11/14/2018	High power-density, high back emf permanent magnet machine	Dolby Intellectual Property Licensing, LLC	Active
243944-EP-4	EP	11/15/2011	EP11189127A	EP2456065	11/14/2018	High power-density, high back emf permanent magnet machine	Dolby Intellectual Property Licensing, LLC	Active
243944-FR-10	FR	11/15/2011	EP11189127A	EP2456065	11/14/2018	High power-density, high back emf permanent magnet machine	Dolby Intellectual Property Licensing, LLC	Active
243944-GB-12	GB	11/15/2011	EP11189127A	EP2456065	11/14/2018	High power-density, high back emf permanent magnet machine	Dolby Intellectual Property Licensing, LLC	Active
243944-IN-5	IN	11/18/2011	IN3297DE2011A	IN360536	3/12/2021	High powerdensity, high back emf permanent magnet machine	Dolby Intellectual Property Licensing, LLC	Active
243944-US-1	US	11/19/2010	US12/949925	US9780716	10/3/2017	High power-density, high back emf permanent magnet machine and method of making same	Dolby Intellectual Property Licensing, LLC	Active
243944-US-7	US	4/20/2017	US15/492544	US10946748	3/16/2021	High power-density, high back emf permanent magnet machine and method of making same	Dolby Intellectual Property Licensing, LLC	Active
243956-CN-3	CN	11/18/2011	CN201110385851A	CN102545479	3/1/2017	Integrated motor and silicon carbide power rod changer assembly and its manufacture method	Dolby Intellectual Property Licensing, LLC	Active
243963-CN-2	CN	5/27/2011	CN201110139784A	CN102263470	8/19/2015	High-speed self-cascaded electric machine	Dolby Intellectual Property Licensing, LLC	Active
243963-IN-3	IN	5/11/2011	IN1390DE2011A	IN358810	2/26/2021	High speed self cascaded electric machine	Dolby Intellectual Property Licensing, LLC	Active

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243963-JP-4	JP	5/20/2011	JP2011112985A	JP5869779	2/24/2016	High speed self cascaded electrical machine	Dolby Intellectual Property Licensing, LLC	Active
243963-US-1	US	5/28/2010	US12/790349	US8115434	2/14/2012	High-speed self-cascaded electric machine	Dolby Intellectual Property Licensing, LLC	Active
244088-US-1	US	8/13/2010	US12/855919	US9059484	6/16/2015	Rechargeable electrochemical cell and method of manufacturing a rechargeable electrochemical cell	Dolby Intellectual Property Licensing, LLC	Active
244092-CN-2	CN	7/27/2012	CN201210263056A	CN102904168	8/8/2017	Distribution system	Dolby Intellectual Property Licensing, LLC	Active
244092-FR-7	FR	7/26/2012	EP12178134A	EP2551866	4/2/2014	Electrical distribution system	Dolby Intellectual Property Licensing, LLC	Active
244092-GB-8	GB	7/26/2012	EP12178134A	EP2551866	4/2/2014	Electrical distribution system	Dolby Intellectual Property Licensing, LLC	Active
244092-IT-6	IT	7/26/2012	EP12178134A	EP2551866	4/2/2014	Electrical distribution system	Dolby Intellectual Property Licensing, LLC	Active
244092-JP-4	JP	7/25/2012	JP2012164288A	JP5973274	8/23/2016	Electric distribution system	Dolby Intellectual Property Licensing, LLC	Active
244092-US-1	US	7/29/2011	US13/194002	US8916996	12/23/2014	Electrical distribution system	Dolby Intellectual Property Licensing, LLC	Active
244295-US-1	US	4/16/2010	US12/761597	US8516302	8/20/2013	Automatic error control scheme selection for fixed-length messages based upon message payload size	Dolby Intellectual Property Licensing, LLC	Active
244409-US-1	US	9/24/2010	US12/889663	US8600123	12/3/2013	System and method for contactless multi-fingerprint collection	Dolby Intellectual Property Licensing, LLC	Active
244409-US-2	US	10/17/2013	US14/056256	US9342728	5/17/2016	System and method for contactless multi-fingerprint collection	Dolby Intellectual Property Licensing, LLC	Active
245157-US-1	US	12/22/2010	US12/976453	US8852786	10/7/2014	Ceramic-metal sealing structure, and associated method	Dolby Intellectual Property Licensing, LLC	Active
245295-US-1	US	12/14/2010	US12/967291	US8778568	7/15/2014	Optical data storage media and methods for using the same	Dolby Intellectual Property Licensing, LLC	Active
245866-US-1	US	12/15/2010	US12/968510	US8674218	3/18/2014	Restraint system for an energy storage device	Dolby Intellectual Property Licensing, LLC	Active
246173-US-1	US	12/21/2010	US12/974512	US8665591	3/4/2014	Systems and methods to thermally manage electronic devices	Dolby Intellectual Property Licensing, LLC	Active
246181-US-1	US	1/11/2011	US13/004757	US8749237	6/10/2014	Optically controlled mems switch and method of using the same	Dolby Intellectual Property Licensing, LLC	Active
246181-US-2	US	3/4/2014	US14/196235	US9676613	6/13/2017	Optically controlled mems switch and method of using the same	Dolby Intellectual Property Licensing, LLC	Active
246390-CN-1	CN	8/9/2012	CN201210281434A	CN103579689	12/16/2015	The manufacture method of electrochemical cell	Dolby Intellectual Property Licensing, LLC	Active
246484-BR-2	BR	11/3/2011	BRPI1104833A	BRPI1104833	6/2/2020	Electronic energy driving circuit	Dolby Intellectual Property Licensing, LLC	Active
246484-CN-3	CN	11/7/2011	CN201110379597A	CN102457089	6/15/2016	Use equipment and the manufacture method thereof of the onboard power electronics transfer energy with high-frequency transformer isolation	Dolby Intellectual Property Licensing, LLC	Active
246484-CN-8	CN	11/7/2011	CN201610329902A	CN106026318	12/31/2019	Device for transferring energy using on-board power electronics with high-frequency transformer isolation and method for manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
246484-DE-10	DE	11/1/2011	EP11187389A	EP2450222	10/2/2019	Apparatus for transferring energy using onboard power electronics with high-frequency transformer isolation and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active

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246484-EP-4	EP	11/1/2011	EP11187389A	EP2450222	10/2/2019	Apparatus for transferring energy using onboard power electronics with high-frequency transformer isolation and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
246484-FR-9	FR	11/1/2011	EP11187389A	EP2450222	10/2/2019	Apparatus for transferring energy using onboard power electronics with high-frequency transformer isolation and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
246484-IN-5	IN	11/2/2011	IN3123DE2011A	IN334354	3/13/2020	Apparatus for transferring energy using onboard power	Dolby Intellectual Property Licensing, LLC	Active
246484-JP-6	JP	10/31/2011	JP2011238096A	JP6093497	3/8/2017	Apparatus for energy transfer using on-board power electronic circuit with high frequency transformer isolation and method of manufacturing the same	Dolby Intellectual Property Licensing, LLC	Active
246484-US-1	US	11/5/2010	US12/940110	US9290097	3/22/2016	Apparatus for transferring energy using onboard power electronics with high-frequency transformer isolation and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
246484-US-7	US	3/17/2016	US15/073061	US10454290	10/22/2019	Apparatus for transferring energy using onboard power electronics with high-frequency transformer isolation and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
246498-US-1	US	12/22/2011	US13/335211	US9273950	3/1/2016	System and method for auto-ranging in optical coherence tomography	Dolby Intellectual Property Licensing, LLC	Active
246687-US-1	US	1/14/2011	US13/007123	US8697279	4/15/2014	Composition and energy storage device	Dolby Intellectual Property Licensing, LLC	Active
246740-US-1	US	5/31/2011	US13/118663	US9027236	5/12/2015	Resonator structures and method of making	Dolby Intellectual Property Licensing, LLC	Active
246897-US-1	US	9/29/2011	US13/248671	US9306195	4/5/2016	Electrochemical cells	Dolby Intellectual Property Licensing, LLC	Active
246939-CA-3	CA	12/22/2011	CA2762711A	CA2762711	1/8/2019	Electric motor structure to minimize electro-magnetic interference	Dolby Intellectual Property Licensing, LLC	Active
246939-US-1	US	12/23/2010	US12/977800	US9343939	5/17/2016	Electric motor structure to minimize electro-magnetic interference	Dolby Intellectual Property Licensing, LLC	Active
246995-CN-1	CN	12/8/2011	CN201110404956A	CN103165900	3/30/2016	A kind of alkali metal-metal halide battery	Dolby Intellectual Property Licensing, LLC	Active
247031-US-1	US	11/17/2011	US13/299021	US8580463	11/12/2013	Reactants for optical data storage media and methods for use	Dolby Intellectual Property Licensing, LLC	Active
247141-US-1	US	1/31/2011	US13/017551	US9153844	10/6/2015	System and methods of using a sodium metal halide cell	Dolby Intellectual Property Licensing, LLC	Active
247243-IN-3	IN	12/22/2011	IN3785DE2011A	IN348971	10/16/2020	Composition, energy storage device, and related processes	Dolby Intellectual Property Licensing, LLC	Active
247243-US-1	US	12/23/2010	US12/977471	US8603671	12/10/2013	Composition, energy storage device, and related processes	Dolby Intellectual Property Licensing, LLC	Active
247255-CN-2	CN	4/18/2012	CN201210129883A	CN102799492	2/9/2018	System, method and apparatus for solving error in systems	Dolby Intellectual Property Licensing, LLC	Active
247255-DE-6	DE	4/16/2012	EP12164343A	EP2515234	6/17/2020	System, method, and apparatus for resolving errors in a system	Dolby Intellectual Property Licensing, LLC	Active
247255-EP-3	EP	4/16/2012	EP12164343A	EP2515234	6/17/2020	System, method, and apparatus for resolving errors in a system	Dolby Intellectual Property Licensing, LLC	Active
247255-FR-5	FR	4/16/2012	EP12164343A	EP2515234	6/17/2020	System, method, and apparatus for resolving errors in a system	Dolby Intellectual Property Licensing, LLC	Active
247255-GB-7	GB	4/16/2012	EP12164343A	EP2515234	6/17/2020	System, method, and apparatus for resolving errors in a system	Dolby Intellectual Property Licensing, LLC	Active

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247255-US-1	US	4/18/2011	US13/089002	US8862938	10/14/2014	System, method, and apparatus for resolving errors in a system	Dolby Intellectual Property Licensing, LLC	Active
247550-CN-4	CN	7/13/2016	CN201610548900A	CN106356572	12/22/2020	Electrochemical cell comprising a conductive matrix	Dolby Intellectual Property Licensing, LLC	Active
247550-KR-5	KR	7/8/2016	KR20160086687A	KR101941655	1/24/2019	Electrochemical cells including a conductive matrix	Dolby Intellectual Property Licensing, LLC	Active
247550-US-3	US	7/13/2015	US14/797679	US9577297	2/21/2017	Electrochemical cells including a conductive matrix	Dolby Intellectual Property Licensing, LLC	Active
247784-CH-7	CH	6/6/2012	EP12171099A	EP2672562	8/8/2018	Systems and methods for predicting battery power-delivery performance	Dolby Intellectual Property Licensing, LLC	Active
247784-CN-2	CN	6/8/2012	CN201210336184A	CN103487755	2/17/2016	For predicting the system and method for power of battery transmission performance	Dolby Intellectual Property Licensing, LLC	Active
247784-DE-6	DE	6/6/2012	EP12171099A	EP2672562	8/8/2018	Systems and methods for predicting battery power-delivery performance	Dolby Intellectual Property Licensing, LLC	Active
247784-EP-3	EP	6/6/2012	EP12171099A	EP2672562	8/8/2018	Systems and methods for predicting battery power-delivery performance	Dolby Intellectual Property Licensing, LLC	Active
247784-FR-5	FR	6/6/2012	EP12171099A	EP2672562	8/8/2018	Systems and methods for predicting battery power-delivery performance	Dolby Intellectual Property Licensing, LLC	Active
247784-GB-8	GB	6/6/2012	EP12171099A	EP2672562	8/8/2018	Systems and methods for predicting battery power-delivery performance	Dolby Intellectual Property Licensing, LLC	Active
247784-JP-4	JP	6/7/2012	JP2012129409A	JP5674713	2/25/2015	System and method for predicting battery power supply performance	Dolby Intellectual Property Licensing, LLC	Active
247784-US-1	US	4/27/2011	US13/095743	US8872481	10/28/2014	Systems and methods for predicting battery power-delivery performance	Dolby Intellectual Property Licensing, LLC	Active
248221-DE-8	DE	3/28/2012	EP12161924A	EP2506189	11/27/2019	Apparatus for contactless high resolution handprint capture	Dolby Intellectual Property Licensing, LLC	Active
248221-EP-2	EP	3/28/2012	EP12161924A	EP2506189	11/27/2019	Apparatus for contactless high resolution handprint capture	Dolby Intellectual Property Licensing, LLC	Active
248221-FR-7	FR	3/28/2012	EP12161924A	EP2506189	11/27/2019	Apparatus for contactless high resolution handprint capture	Dolby Intellectual Property Licensing, LLC	Active
248221-GB-9	GB	3/28/2012	EP12161924A	EP2506189	11/27/2019	Apparatus for contactless high resolution handprint capture	Dolby Intellectual Property Licensing, LLC	Active
248221-JP-3	JP	3/28/2012	JP2012072648A	JP5928792	6/1/2016	Apparatus and method for non-contact high resolution bill capture	Dolby Intellectual Property Licensing, LLC	Active
248221-SG-5	SG	3/22/2012	SG10201405993WA	SG10201405993W	11/27/2014	Apparatus and method for contactless high resolution handprint capture	Dolby Intellectual Property Licensing, LLC	Active
248221-US-1	US	3/30/2011	US13/075694	US8971588	3/3/2015	Apparatus and method for contactless high resolution handprint capture	Dolby Intellectual Property Licensing, LLC	Active
248221-US-6	US	2/18/2015	US14/624639	US9536127	1/3/2017	Apparatus and method for contactless high resolution handprint capture	Dolby Intellectual Property Licensing, LLC	Active
248672-US-1	US	9/30/2011	US13/249830	US8816635	8/26/2014	Charging system using sodium level control in individual sealed anode tubes	Dolby Intellectual Property Licensing, LLC	Active
248678-BR-2	BR	3/22/2012	BR102012006427A	BR102012006427	9/24/2020	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
248678-CN-3	CN	3/23/2012	CN201210162119A	CN102689603	3/1/2017	For supplying system and its manufacture method of promotion energy from process auxiliary drive	Dolby Intellectual Property Licensing, LLC	Active
248678-CN-7	CN	3/23/2012	CN201611198513A	CN106956593	11/29/2019	For the system and its manufacturing method from auxiliary drive supply promotion energy	Dolby Intellectual Property Licensing, LLC	Active

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248678-DE-8	DE	3/22/2012	EP12160730A	EP2502773	6/12/2019	System for supplying propulsion energy from an auxiliary drive and method of making same	Dolby Intellectual Property Licensing, LLC	Active
248678-EP-4	EP	3/22/2012	EP12160730A	EP2502773	6/12/2019	System for supplying propulsion energy from an auxiliary drive and method of making same	Dolby Intellectual Property Licensing, LLC	Active
248678-IN-5	IN	3/13/2012	IN716DE2012A	IN402320	8/5/2022	System for supplying propulsion energy from an auxilary	Dolby Intellectual Property Licensing, LLC	Active
248678-JP-6	JP	3/16/2012	JP2012059519A	JP6247811	12/13/2017	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
248678-US-1	US	3/23/2011	US13/069533	US8761978	6/24/2014	System for supplying propulsion energy from an auxiliary drive and method of making same	Dolby Intellectual Property Licensing, LLC	Active
248986-CN-4	CN	10/25/2012	CN201280059325A	CN103959418	10/19/2016	Micro-electromechanical switch and correlation technique thereof	Dolby Intellectual Property Licensing, LLC	Active
248986-DE-3	DE	10/25/2012	DE112012005009T	DE112012005009	9/4/2014	Microelectromechanical switch and associated method therefor	Dolby Intellectual Property Licensing, LLC	Active
249037-CN-1	CN	11/16/2011	CN201110363333A	CN103116074	9/7/2016	The change detection of ac network phase place and compensation system and method	Dolby Intellectual Property Licensing, LLC	Active
249074-DE-6	DE	1/16/2013	EP13151418A	EP2617688	5/2/2018	Sealing glass composition and article	Dolby Intellectual Property Licensing, LLC	Active
249074-FR-7	FR	1/16/2013	EP13151418A	EP2617688	5/2/2018	Sealing glass composition and article	Dolby Intellectual Property Licensing, LLC	Active
249074-GB-5	GB	1/16/2013	EP13151418A	EP2617688	5/2/2018	Sealing glass composition and article	Dolby Intellectual Property Licensing, LLC	Active
249074-JP-2	JP	1/8/2013	JP2013000762A	JP6105938	3/29/2017	Sodium battery	Dolby Intellectual Property Licensing, LLC	Active
249074-KR-3	KR	1/17/2013	KR20130005183A	KR102009796	8/13/2019	Sealing glass composition and article	Dolby Intellectual Property Licensing, LLC	Active
249074-US-1	US	1/19/2012	US13/354101	US9067818	6/30/2015	Sealing glass composition and article	Dolby Intellectual Property Licensing, LLC	Active
249090-CH-9	CH	9/26/2013	EP13186251A	EP2713379	12/20/2017	A switching apparatus including gating circuitry for actuating micro-electromechanical system (mems) switches	Dolby Intellectual Property Licensing, LLC	Active
249090-DE-4	DE	9/26/2013	EP13186251A	EP2713379	12/20/2017	A switching apparatus including gating circuitry for actuating micro-electromechanical system (mems) switches	Dolby Intellectual Property Licensing, LLC	Active
249090-FI-10	FI	9/26/2013	EP13186251A	EP2713379	12/20/2017	A switching apparatus including gating circuitry for actuating micro-electromechanical system (mems) switches	Dolby Intellectual Property Licensing, LLC	Active
249090-FR-5	FR	9/26/2013	EP13186251A	EP2713379	12/20/2017	A switching apparatus including gating circuitry for actuating micro-electromechanical system (mems) switches	Dolby Intellectual Property Licensing, LLC	Active
249090-GB-6	GB	9/26/2013	EP13186251A	EP2713379	12/20/2017	A switching apparatus including gating circuitry for actuating micro-electromechanical system (mems) switches	Dolby Intellectual Property Licensing, LLC	Active
249090-IT-7	IT	9/26/2013	EP13186251A	EP2713379	12/20/2017	A switching apparatus including gating circuitry for actuating micro-electromechanical system (mems) switches	Dolby Intellectual Property Licensing, LLC	Active
249090-JP-3	JP	9/20/2013	JP2013194762A	JP6243674	12/6/2017	Switching device including a gate circuit for operating a microelectromechanical system (mems) switch	Dolby Intellectual Property Licensing, LLC	Active

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249090-SE-8	SE	9/26/2013	EP13186251A	EP2713379	12/20/2017	A switching apparatus including gating circuitry for actuating micro-electromechanical system (mems) switches	Dolby Intellectual Property Licensing, LLC	Active
249090-US-1	US	9/28/2012	US13/630122	US8659326	2/25/2014	Switching apparatus including gating circuitry for actuating micro-electromechanical system (mems) switches	Dolby Intellectual Property Licensing, LLC	Active
249187-US-2	US	2/14/2013	US13/767048	US9130249	9/8/2015	Battery cell design and method of cooling battery cells	Dolby Intellectual Property Licensing, LLC	Active
249391-CN-1	CN	3/23/2012	CN201210080623A	CN103326350	3/16/2016	Inverter controller, energy conversion system, photovoltaic energy conversion system and method	Dolby Intellectual Property Licensing, LLC	Active
250154-DE-6	DE	12/6/2012	EP12195915A	EP2613497	3/6/2019	Method of transporting data in a sub-segmented manner	Dolby Intellectual Property Licensing, LLC	Active
250154-EP-4	EP	12/6/2012	EP12195915A	EP2613497	3/6/2019	Method of transporting data in a sub-segmented manner	Dolby Intellectual Property Licensing, LLC	Active
250154-FR-5	FR	12/6/2012	EP12195915A	EP2613497	3/6/2019	Method of transporting data in a sub-segmented manner	Dolby Intellectual Property Licensing, LLC	Active
250154-GB-7	GB	12/6/2012	EP12195915A	EP2613497	3/6/2019	Method of transporting data in a sub-segmented manner	Dolby Intellectual Property Licensing, LLC	Active
250154-JP-2	JP	12/4/2012	JP2012264822A	JP6148459	6/14/2017	How to transport data from a source node to a destination node	Dolby Intellectual Property Licensing, LLC	Active
250154-KR-3	KR	12/7/2012	KR20120142091A	KR102046792	11/20/2019	Method of transporting data from sending node to destination node	Dolby Intellectual Property Licensing, LLC	Active
250154-US-1	US	12/9/2011	US13/315955	US8976814	3/10/2015	Method of transporting data from sending node to destination node	Dolby Intellectual Property Licensing, LLC	Active
250286-US-1	US	3/20/2011	US13/052097	US8478077	7/2/2013	Optimal gradient pursuit for image alignment	Dolby Intellectual Property Licensing, LLC	Active
250286-US-7	US	7/1/2013	US13/932763	US8768100	7/1/2014	Optimal gradient pursuit for image alignment	Dolby Intellectual Property Licensing, LLC	Active
250455-CH-13	CH	12/18/2012	EP12197725A	EP2610943	2/15/2017	Recahrgeable battery with insulating compression means between the cover and the cells and method of assembling the battery	Dolby Intellectual Property Licensing, LLC	Active
250455-DE-11	DE	12/18/2012	EP12197725A	EP2610943	2/15/2017	Recahrgeable battery with insulating compression means between the cover and the cells and method of assembling the battery	Dolby Intellectual Property Licensing, LLC	Active
250455-FR-10	FR	12/18/2012	EP12197725A	EP2610943	2/15/2017	Recahrgeable battery with insulating compression means between the cover and the cells and method of assembling the battery	Dolby Intellectual Property Licensing, LLC	Active
250455-GB-9	GB	12/18/2012	EP12197725A	EP2610943	2/15/2017	Recahrgeable battery with insulating compression means between the cover and the cells and method of assembling the battery	Dolby Intellectual Property Licensing, LLC	Active
250455-IN-3	IN	12/10/2012	IN3778DE2012A	IN430715	5/5/2023	Rechargeable battery and method	Dolby Intellectual Property Licensing, LLC	Active
250455-IT-12	IT	12/18/2012	EP12197725A	EP2610943	2/15/2017	Recahrgeable battery with insulating compression means between the cover and the cells and method of assembling the battery	Dolby Intellectual Property Licensing, LLC	Active
250455-JP-5	JP	12/25/2012	JP2012280441A	JP6148463	6/14/2017	Rechargeable storage battery and method	Dolby Intellectual Property Licensing, LLC	Active

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250455-KR-7	KR	12/28/2012	KR20120155823A	KR102037985	10/29/2019	Rechargeable battery with insulating compression means between cover and cells and assembling method thereof	Dolby Intellectual Property Licensing, LLC	Active
250455-US-8	US	5/9/2016	US15/149523	US10270072	4/23/2019	Rechargeable battery and method	Dolby Intellectual Property Licensing, LLC	Active
250455-ZA-4	ZA	12/14/2012	ZA201209558A	ZA201209558	12/23/2014	Rechargeable battery and method	Dolby Intellectual Property Licensing, LLC	Active
250744-US-1	US	12/29/2011	US13/339677	US9647470	5/9/2017	Rechargeable battery system	Dolby Intellectual Property Licensing, LLC	Active
250841-CA-3	CA	8/9/2012	CA2785405A	CA2785405	9/10/2019	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-CH-15	CH	8/10/2012	EP12180159A	EP2581877	4/7/2021	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-CN-4	CN	8/13/2012	CN201210286078A	CN103116739	11/24/2017	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-DE-11	DE	8/10/2012	EP12180159A	EP2581877	4/7/2021	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-EP-5	EP	8/10/2012	EP12180159A	EP2581877	4/7/2021	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-ES-14	ES	8/10/2012	EP12180159A	EP2581877	4/7/2021	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-FR-10	FR	8/10/2012	EP12180159A	EP2581877	4/7/2021	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-GB-16	GB	8/10/2012	EP12180159A	EP2581877	4/7/2021	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-IN-6	IN	8/8/2012	IN2483DE2012A	IN450468	9/15/2023	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-IT-12	IT	8/10/2012	EP12180159A	EP2581877	4/7/2021	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-JP-7	JP	8/10/2012	JP2012177773A	JP6081101	2/15/2017	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-KR-8	KR	8/13/2012	KR20120088526A	KR102001678	7/18/2019	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-NL-13	NL	8/10/2012	EP12180159A	EP2581877	4/7/2021	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-US-1	US	10/13/2011	US13/272424	US8340456	12/25/2012	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
250841-US-9	US	12/19/2012	US13/719534	US8737756	5/27/2014	System and method for depth from defocus imaging	Dolby Intellectual Property Licensing, LLC	Active
251009-DE-2	DE	11/22/2012	DE102012111303A	DE102012111303	6/6/2013	Usage measurement methods and systems for interactive advertising	Dolby Intellectual Property Licensing, LLC	Active
251009-JP-5	JP	11/26/2012	JP2012257006A	JP6267861	1/24/2018	Usage measurement techniques and systems for interactive advertising	Dolby Intellectual Property Licensing, LLC	Active
251009-KR-6	KR	11/29/2012	KR20120137208A	KR102054443	12/10/2019	Usage measurement techniques and systems for interactive advertising	Dolby Intellectual Property Licensing, LLC	Active
251336-US-1	US	10/28/2011	US13/283931	US8829719	9/9/2014	System for multiple energy storage and management and method of making same	Dolby Intellectual Property Licensing, LLC	Active
251344-CN-2	CN	7/2/2012	CN201210242220A	CN102982753	10/17/2017	Personage tracks and interactive advertisement	Dolby Intellectual Property Licensing, LLC	Active

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251344-GB-4	GB	6/28/2012	GB201211505A	GB2494235	8/30/2017	Person tracking and interactive advertising	Dolby Intellectual Property Licensing, LLC	Active
251344-JP-5	JP	6/29/2012	JP2012146222A	JP6074177	2/1/2017	Person tracking and interactive advertising	Dolby Intellectual Property Licensing, LLC	Active
251344-KR-6	KR	6/29/2012	KR20120071337A	KR101983337	5/28/2019	Person tracking and interactive advertising	Dolby Intellectual Property Licensing, LLC	Active
251400-CN-2	CN	10/26/2012	CN201210414745A	CN103085675	3/1/2017	For optionally making the energy be coupled in system and its manufacture method of load	Dolby Intellectual Property Licensing, LLC	Active
251400-CN-4	CN	10/26/2012	CN201710024810A	CN107054091	8/28/2020	System for selectively coupling an energy source to a load and method of making same	Dolby Intellectual Property Licensing, LLC	Active
251400-US-1	US	10/28/2011	US13/283748	US9073438	7/7/2015	System for selectively coupling an energy source to a load and method of making same	Dolby Intellectual Property Licensing, LLC	Active
251400-US-3	US	6/2/2015	US14/728738	US10666045	5/26/2020	System for selectively coupling an energy source to a load and method of making same	Dolby Intellectual Property Licensing, LLC	Active
251400-US-5	US	3/27/2019	US16/366449	US10958069	3/23/2021	System for selectively coupling an energy source to a load and method of making same	Dolby Intellectual Property Licensing, LLC	Active
251417-US-1	US	10/28/2011	US13/283983	US8916993	12/23/2014	System for multiple energy storage and management and method of making same	Dolby Intellectual Property Licensing, LLC	Active
251417-US-2	US	12/5/2014	US14/562042	US9809128	11/7/2017	System for multiple energy storage and management and method of making same	Dolby Intellectual Property Licensing, LLC	Active
251425-US-1	US	10/28/2011	US13/283829	US9000614	4/7/2015	System for multiple energy storage and management and method of making same	Dolby Intellectual Property Licensing, LLC	Active
251485-US-1	US	9/16/2011	US13/234942	US8901463	12/2/2014	Thermal management device	Dolby Intellectual Property Licensing, LLC	Active
251698-US-1	US	11/30/2011	US13/307191	US8928259	1/6/2015	Modular stacked dc architecture traction system and method of making same	Dolby Intellectual Property Licensing, LLC	Active
251698-US-2	US	1/5/2015	US14/589195	US9586496	3/7/2017	Modular stacked dc architecture traction system and method of making same	Dolby Intellectual Property Licensing, LLC	Active
251698-US-3	US	1/25/2017	US15/415195	US10044312	8/7/2018	Modular stacked dc architecture traction system and method of making same	Dolby Intellectual Property Licensing, LLC	Active
252096-US-1	US	1/8/2009	US29/330540	USD645043	9/13/2011	Display	Dolby Intellectual Property Licensing, LLC	Active
252198-US-1	US	12/14/2011	US13/325731	US8829886	9/9/2014	Systems and methods for defect detection using exoelectrons	Dolby Intellectual Property Licensing, LLC	Active
252223-CA-6	CA	12/5/2012	CA2861780A	CA2861780	4/14/2020	Method and system for controlling energy storage device	Dolby Intellectual Property Licensing, LLC	Active
252223-CN-3	CN	12/5/2012	CN201280070859A	CN104137322	3/8/2017	For controlling the method and system of energy accumulating device	Dolby Intellectual Property Licensing, LLC	Active
252223-DE-8	DE	12/5/2012	EP12814026A	EP2798693	3/4/2020	Method and system for controlling energy storage device	Dolby Intellectual Property Licensing, LLC	Active
252223-EP-4	EP	12/5/2012	EP12814026A	EP2798693	3/4/2020	Method and system for controlling energy storage device	Dolby Intellectual Property Licensing, LLC	Active
252223-FR-7	FR	12/5/2012	EP12814026A	EP2798693	3/4/2020	Method and system for controlling energy storage device	Dolby Intellectual Property Licensing, LLC	Active
252223-GB-10	GB	12/5/2012	EP12814026A	EP2798693	3/4/2020	Method and system for controlling energy storage device	Dolby Intellectual Property Licensing, LLC	Active
252223-IT-9	IT	12/5/2012	EP12814026A	EP2798693	3/4/2020	Method and system for controlling energy storage device	Dolby Intellectual Property Licensing, LLC	Active

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252223-JP-5	JP	12/5/2012	JP2014550312A	JP6027630	11/16/2016	Method and system for controlling an energy storage device	Dolby Intellectual Property Licensing, LLC	Active
252223-US-1	US	12/28/2011	US13/338380	US9147910	9/29/2015	Method and system for controlling energy storage device	Dolby Intellectual Property Licensing, LLC	Active
252310-BR-2	BR	8/10/2012	BR102012020043A	BR102012020043	11/17/2020	Multi-energy storage device system, method of mounting a propulsion power system and computer-readable storage medium	Dolby Intellectual Property Licensing, LLC	Active
252310-CN-3	CN	8/13/2012	CN201210286067A	CN102951034	8/3/2016	For optimizing the system and method for energy storing device cycle life	Dolby Intellectual Property Licensing, LLC	Active
252310-EP-4	EP	8/9/2012	EP12179967A	EP2556988	2/13/2013	System and method for optimizing energy storage device ccle life	Dolby Intellectual Property Licensing, LLC	Active
252310-US-1	US	8/12/2011	US13/209138	US8963365	2/24/2015	System and method for optimizing energy storage device cycle life	Dolby Intellectual Property Licensing, LLC	Active
252382-BR-2	BR	8/16/2012	BR102012020586A	BR102012020586	10/27/2020	Energy management and storage system	Dolby Intellectual Property Licensing, LLC	Active
252382-CN-3	CN	8/24/2012	CN201210304501A	CN102957188	11/7/2017	For the apparatus and method to electric vehicle charging	Dolby Intellectual Property Licensing, LLC	Active
252382-DE-8	DE	8/15/2012	EP12180556A	EP2562030	12/22/2021	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
252382-EP-4	EP	8/15/2012	EP12180556A	EP2562030	12/22/2021	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
252382-FR-7	FR	8/15/2012	EP12180556A	EP2562030	12/22/2021	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
252382-GB-9	GB	8/15/2012	EP12180556A	EP2562030	12/22/2021	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
252382-JP-6	JP	8/17/2012	JP2012180693A	JP6130634	5/17/2017	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
252382-US-1	US	8/24/2011	US13/216590	US8994327	3/31/2015	Apparatus and method for charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
252471-US-1	US	11/28/2011	US13/304791	US9520741	12/13/2016	System for charging electrical storage device and method of making same	Dolby Intellectual Property Licensing, LLC	Active
252665-CN-1	CN	11/10/2011	CN201110355846A	CN103107760	5/25/2016	Motor control method and system	Dolby Intellectual Property Licensing, LLC	Active
252665-DE-6	DE	11/7/2012	EP12191698A	EP2592747	3/7/2018	Method and system for controlling motor	Dolby Intellectual Property Licensing, LLC	Active
252665-ES-10	ES	11/7/2012	EP12191698A	EP2592747	3/7/2018	Method and system for controlling motor	Dolby Intellectual Property Licensing, LLC	Active
252665-FR-7	FR	11/7/2012	EP12191698A	EP2592747	3/7/2018	Method and system for controlling motor	Dolby Intellectual Property Licensing, LLC	Active
252665-GB-8	GB	11/7/2012	EP12191698A	EP2592747	3/7/2018	Method and system for controlling motor	Dolby Intellectual Property Licensing, LLC	Active
252665-IN-3	IN	10/25/2012	IN3295DE2012A	IN421291	2/17/2023	Method and system for controlling motor	Dolby Intellectual Property Licensing, LLC	Active
252665-IT-9	IT	11/7/2012	EP12191698A	EP2592747	3/7/2018	Method and system for controlling motor	Dolby Intellectual Property Licensing, LLC	Active
252665-JP-4	JP	11/6/2012	JP2012244033A	JP6302158	3/28/2018	Method and system for controlling a motor	Dolby Intellectual Property Licensing, LLC	Active
252665-US-5	US	11/9/2012	US13/673240	US8963460	2/24/2015	Method and system for controlling motor	Dolby Intellectual Property Licensing, LLC	Active

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252995-US-2	US	8/27/2012	US13/595541	US8757471	6/24/2014	Active braze techniques on beta-alumina	Dolby Intellectual Property Licensing, LLC	Active
253004-US-1	US	3/28/2013	US13/852690	US9735401	8/15/2017	Sealed sodium-based thermal batteries and methods of sealing same	Dolby Intellectual Property Licensing, LLC	Active
253010-US-1	US	4/30/2012	US13/459840	US8524348	9/3/2013	Stacked film optical data storage device and method of manufacture	Dolby Intellectual Property Licensing, LLC	Active
253610-CN-1	CN	2/17/2012	CN201210037209A	CN103259488	4/27/2016	Motor control method, control system and control device	Dolby Intellectual Property Licensing, LLC	Active
253755-CN-1	CN	2/17/2012	CN201210038096A	CN103259281	12/16/2015	There is energy conversion system and the method for negative-sequence current compensation mechanism	Dolby Intellectual Property Licensing, LLC	Active
253831-JP-2	JP	10/24/2012	JP2012234250A	JP6194164	9/6/2017	Apparatus and method for quickly charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
253831-US-1	US	10/31/2011	US13/285983	US8829722	9/9/2014	Apparatus and method for rapidly charging an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
254250-US-1	US	6/26/2012	US13/533192	US9102119	8/11/2015	Encapsulated beam and method of forming	Dolby Intellectual Property Licensing, LLC	Active
254250-US-2	US	7/14/2015	US14/798837	US10183467	1/22/2019	Encapsulated beam and method of forming	Dolby Intellectual Property Licensing, LLC	Active
254256-US-1	US	11/29/2011	US13/305817	US9290107	3/22/2016	System and method for energy management in an electric vehicle	Dolby Intellectual Property Licensing, LLC	Active
254472-DE-4	DE	1/10/2013	EP13701179A	EP2810323	5/30/2018	Electrode compositions, energy storage devices and related methods	Dolby Intellectual Property Licensing, LLC	Active
254472-FR-5	FR	1/10/2013	EP13701179A	EP2810323	5/30/2018	Electrode compositions, energy storage devices and related methods	Dolby Intellectual Property Licensing, LLC	Active
254472-GB-6	GB	1/10/2013	EP13701179A	EP2810323	5/30/2018	Electrode compositions, energy storage devices and related methods	Dolby Intellectual Property Licensing, LLC	Active
254472-IT-7	IT	1/10/2013	EP13701179A	EP2810323	5/30/2018	Electrode compositions, energy storage devices and related methods	Dolby Intellectual Property Licensing, LLC	Active
254472-US-1	US	1/30/2012	US13/361317	US8993169	3/31/2015	Electrode compositions, energy storage devices and related methods	Dolby Intellectual Property Licensing, LLC	Active
254566-CN-1	CN	4/24/2012	CN201210122557A	CN103378603	3/1/2017	Open-circuit fault detection device, inverter controller, energy conversion system and method	Dolby Intellectual Property Licensing, LLC	Active
254869-CH-14	CH	10/22/2012	EP12189424A	EP2587607	7/12/2017	Integrated power system control method and related apparatus with energy storage element	Dolby Intellectual Property Licensing, LLC	Active
254869-CN-4	CN	10/25/2012	CN201210412388A	CN103078389	9/12/2017	Integrated power system control method and the relevant device with energy storage elements	Dolby Intellectual Property Licensing, LLC	Active
254869-DE-13	DE	10/22/2012	EP12189424A	EP2587607	7/12/2017	Integrated power system control method and related apparatus with energy storage element	Dolby Intellectual Property Licensing, LLC	Active
254869-FR-12	FR	10/22/2012	EP12189424A	EP2587607	7/12/2017	Integrated power system control method and related apparatus with energy storage element	Dolby Intellectual Property Licensing, LLC	Active
254869-GB-15	GB	10/22/2012	EP12189424A	EP2587607	7/12/2017	Integrated power system control method and related apparatus with energy storage element	Dolby Intellectual Property Licensing, LLC	Active
254869-ID-6	ID	10/22/2012	P00201200893	N/A	5/17/2019		Dolby Intellectual Property Licensing, LLC	Active
254869-JP-8	JP	10/23/2012	JP2012233358A	JP6188120	8/30/2017	Integrated power generation system control method with energy storage element and related apparatus	Dolby Intellectual Property Licensing, LLC	Active
254869-MY-9	MY	10/5/2012	MYPI2012004461A	MY166391	6/25/2018	Integrated power system control method and related apparatus with energy storage element	Dolby Intellectual Property Licensing, LLC	Active

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254869-NG-11	NG	4/11/2013	NGC2013296	N/A	2/25/2014		Dolby Intellectual Property Licensing, LLC	Active
254869-US-2	US	7/12/2012	US13/547250	US9496748	11/15/2016	Integrated power system control method and related apparatus with energy storage element	Dolby Intellectual Property Licensing, LLC	Active
254869-US-3	US	7/13/2012	US13/548665	US9257868	2/9/2016	Integrated power system control method and related apparatus with energy storage element	Dolby Intellectual Property Licensing, LLC	Active
254869-ZA-10	ZA	10/10/2012	ZA201207611 A	ZA20120761 1	10/29/2014	Integrated power system control method and related apparatus with energy storage element	Dolby Intellectual Property Licensing, LLC	Active
254975-AU-2	AU	8/29/2012	AU201221650 1A	AU2012216 501	8/4/2016	Controller and method of controlling a power system	Dolby Intellectual Property Licensing, LLC	Active
254975-CN-3	CN	9/6/2012	CN201210326 909A	CN10298356 6	4/12/2017	Controller and method of controlling a power system	Dolby Intellectual Property Licensing, LLC	Active
254975-CN-7	CN	9/6/2012	CN201710149 835A	CN10687734 1	6/30/2020	Controller and method for controlling power system	Dolby Intellectual Property Licensing, LLC	Active
254975-DE-8	DE	8/30/2012	EP12182470A	EP2568561	10/2/2019	Controller and method of controlling a power system	Dolby Intellectual Property Licensing, LLC	Active
254975-EP-4	EP	8/30/2012	EP12182470A	EP2568561	10/2/2019	Controller and method of controlling a power system	Dolby Intellectual Property Licensing, LLC	Active
254975-JP-5	JP	9/4/2012	JP2012193660 A	JP6068063	1/25/2017	Controller and method for controlling a power system	Dolby Intellectual Property Licensing, LLC	Active
254975-KR-6	KR	9/5/2012	KR201200981 31A	KR10199841 1	7/9/2019	Controller and method of controlling a power system	Dolby Intellectual Property Licensing, LLC	Active
254975-US-1	US	9/6/2011	US13/225975	US8326467	12/4/2012	Controller and method of controlling a power system	Dolby Intellectual Property Licensing, LLC	Active
254993-US-1	US	12/28/2011	US13/338325	US8916285	12/23/2014	Modular high temperature battery electrical configurations	Dolby Intellectual Property Licensing, LLC	Active
256271-US-1	US	11/7/2011	US13/290928	US9305357	4/5/2016	Automatic surveillance video matting using a shape prior	Dolby Intellectual Property Licensing, LLC	Active
256271-US-2	US	2/29/2016	US15/056669	US10147021	12/4/2018	Automatic surveillance video matting using a shape prior	Dolby Intellectual Property Licensing, LLC	Active
256289-US-1	US	2/23/2012	US13/403030	US8750566	6/10/2014	Apparatus and method for spatially relating views of sky images acquired at spaced apart locations	Dolby Intellectual Property Licensing, LLC	Active
256606-BR-10	BR	5/24/2013	BR102013012 941A	BR10201301 2941	4/30/2019	Strong welder allocation and electrochemical cell composition	Dolby Intellectual Property Licensing, LLC	Active
256606-BR-11	BR	5/24/2013	BR102013012 938A	BR10201301 2938	4/30/2019	Composition of bolding alloy and electrochemical cell	Dolby Intellectual Property Licensing, LLC	Active
256606-DE-21	DE	5/24/2013	EP13169250A	EP2666582	7/3/2019	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active
256606-DE-24	DE	5/24/2013	EP13169240A	EP2666581	9/9/2020	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active
256606-EP-13	EP	5/24/2013	EP13169250A	EP2666582	7/3/2019	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active
256606-EP-5	EP	5/24/2013	EP13169240A	EP2666581	9/9/2020	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active
256606-GB-23	GB	5/24/2013	EP13169250A	EP2666582	7/3/2019	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active
256606-GB-26	GB	5/24/2013	EP13169240A	EP2666581	9/9/2020	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active

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256606-IN-14	IN	5/7/2013	IN1351DE2013A	IN448141	9/1/2023	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active
256606-IN-6	IN	5/7/2013	IN1350DE2013A	IN398874	6/17/2022	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active
256606-IT-22	IT	5/24/2013	EP13169250A	EP2666582	7/3/2019	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active
256606-IT-25	IT	5/24/2013	EP13169240A	EP2666581	9/9/2020	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active
256606-JP-15	JP	5/22/2013	JP2013107544A	JP6266232	1/24/2018	Brazing composition and related equipment	Dolby Intellectual Property Licensing, LLC	Active
256606-JP-7	JP	5/22/2013	JP2013107545A	JP6266233	1/24/2018	Brazing composition and related equipment	Dolby Intellectual Property Licensing, LLC	Active
256606-KR-8	KR	5/22/2013	KR20130057600A	KR102162549	10/8/2020	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active
256606-US-2	US	6/29/2012	US13/538203	US10105795	10/23/2018	Braze compositions, and related devices	Dolby Intellectual Property Licensing, LLC	Active
256975-CN-1	CN	12/3/2012	CN201210509493A	CN103847530	4/12/2017	Electric drive system and energy managing method thereof	Dolby Intellectual Property Licensing, LLC	Active
256975-EP-4	EP	12/2/2013	EP13195375A	EP2738036	6/4/2014	Electric drive system and energy management method	Dolby Intellectual Property Licensing, LLC	Active
256975-JP-3	JP	11/29/2013	JP2013246847A	JP6334147	5/30/2018	Electric drive system and energy management method	Dolby Intellectual Property Licensing, LLC	Active
256975-JP-7	JP	5/7/2018	JP2018089123A	JP6672372	3/25/2020	Electric drive system and energy management method	Dolby Intellectual Property Licensing, LLC	Active
256975-JP-8	JP	5/7/2018	JP2018089124A	JP6672373	3/25/2020	Electric drive system and energy management method	Dolby Intellectual Property Licensing, LLC	Active
256975-US-11	US	5/4/2020	US16/866028	US11374508	6/28/2022	Electric drive system and energy management method	Dolby Intellectual Property Licensing, LLC	Active
256975-US-2	US	12/2/2013	US14/094086	US9800182	10/24/2017	Electric drive system and energy management method	Dolby Intellectual Property Licensing, LLC	Active
256975-US-5	US	3/8/2017	US15/453218	US10374529	8/6/2019	Electric drive system and energy management method	Dolby Intellectual Property Licensing, LLC	Active
256975-US-6	US	9/1/2017	US15/693976	US10291158	5/14/2019	Electric drive system and energy management method	Dolby Intellectual Property Licensing, LLC	Active
256975-US-9	US	6/6/2019	US16/433348	US10673358	6/2/2020	Electric drive system and energy management method	Dolby Intellectual Property Licensing, LLC	Active
257013-BR-6	BR	3/10/2014	BR102014005475A	BR1020140055475	4/20/2021	Engine drive system	Dolby Intellectual Property Licensing, LLC	Active
257013-CN-1	CN	3/14/2013	CN201310082173A	CN104052373	4/12/2017	Motor fault protection system and method	Dolby Intellectual Property Licensing, LLC	Active
257013-DE-8	DE	3/11/2014	EP14158838A	EP2779416	7/13/2022	System for fault protection of a motor	Dolby Intellectual Property Licensing, LLC	Active
257013-EP-4	EP	3/11/2014	EP14158838A	EP2779416	7/13/2022	System for fault protection of a motor	Dolby Intellectual Property Licensing, LLC	Active
257013-IN-5	IN	3/10/2014	IN1201CH2014A	IN431908	5/19/2023	System and method for fault protection of a motor	Dolby Intellectual Property Licensing, LLC	Active
257013-JP-3	JP	3/11/2014	JP2014047009A	JP6285223	2/28/2018	System and method for motor fault protection	Dolby Intellectual Property Licensing, LLC	Active

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257013-US-2	US	3/12/2014	US14/205489	US9438144	9/6/2016	System and method for fault protection of a motor	Dolby Intellectual Property Licensing, LLC	Active
257013-US-7	US	8/3/2016	US15/227439	US9742345	8/22/2017	System and method for fault protection of a motor	Dolby Intellectual Property Licensing, LLC	Active
257035-US-1	US	3/8/2012	US13/414800	US9120390	9/1/2015	Apparatus for transferring energy using onboard power electronics and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
257085-JP-3	JP	5/17/2013	JP2013104607A	JP6196805	9/13/2017	Energy storage device and energy storage method	Dolby Intellectual Property Licensing, LLC	Active
257085-US-2	US	12/3/2012	US13/692087	US9005793	4/14/2015	Energy storage article and method	Dolby Intellectual Property Licensing, LLC	Active
257472-US-2	US	11/15/2012	US13/677613	US8949163	2/3/2015	Adoption simulation with evidential reasoning using agent models in a hierarchical structure	Dolby Intellectual Property Licensing, LLC	Active
257527-CN-2	CN	5/17/2013	CN201310182840A	CN103427680	3/27/2018	Transformer tapping translation circuit and preparation method thereof	Dolby Intellectual Property Licensing, LLC	Active
257527-JP-3	JP	5/14/2013	JP2013101771A	JP6259202	1/10/2018	Transformer tap switching circuit and method for making the same	Dolby Intellectual Property Licensing, LLC	Active
257527-US-1	US	5/18/2012	US13/475186	US9025352	5/5/2015	Transformer tap-changing circuit and method of making same	Dolby Intellectual Property Licensing, LLC	Active
257939-US-1	US	7/24/2012	US13/556525	US9933488	4/3/2018	Open circuit voltage checking for a battery system	Dolby Intellectual Property Licensing, LLC	Active
257940-US-1	US	7/25/2012	US13/557676	US9148025	9/29/2015	System and method for a rechargeable battery	Dolby Intellectual Property Licensing, LLC	Active
259209-US-1	US	4/26/2012	US13/456399	US8842881	9/23/2014	Real-time video tracking system	Dolby Intellectual Property Licensing, LLC	Active
259209-US-2	US	9/22/2014	US14/493044	US9626581	4/18/2017	Real-time video tracking system	Dolby Intellectual Property Licensing, LLC	Active
259236-CA-10	CA	9/12/2013	CA2884670A	CA2884670	7/14/2020	System and method for generating an activity summary of a person	Dolby Intellectual Property Licensing, LLC	Active
259236-JP-9	JP	9/12/2013	JP2015532045A	JP6307083	4/4/2018	System and method for generating a human behavior summary	Dolby Intellectual Property Licensing, LLC	Active
259236-KR-8	KR	9/12/2013	KR20157009311A	KR102189205	12/10/2020	System and method for generating an activity summary of a person	Dolby Intellectual Property Licensing, LLC	Active
259236-US-2	US	5/7/2013	US13/888941	US10271017	4/23/2019	System and method for generating an activity summary of a person	Dolby Intellectual Property Licensing, LLC	Active
259276-CN-2	CN	5/21/2013	CN201310189269A	CN103419669	4/12/2017	Method and apparatus for charging multiple energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
259276-CN-5	CN	5/21/2013	CN201611216567A	CN106926718	3/20/2020	Method and apparatus for charging a plurality of energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
259276-JP-3	JP	5/17/2013	JP2013104614A	JP6557445	8/7/2019	Method and apparatus for charging a plurality of energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
259276-US-1	US	5/21/2012	US13/476165	US8981727	3/17/2015	Method and apparatus for charging multiple energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
259276-US-10	US	2/3/2022	US17/592062	US11697352	7/11/2023	Method and apparatus for charging multiple energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
259276-US-4	US	3/13/2015	US14/656782	US9821668	11/21/2017	Method and apparatus for charging multiple energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
259276-US-6	US	9/22/2017	US15/712904	US10081257	9/25/2018	Method and apparatus for charging multiple energy storage devices	Dolby Intellectual Property Licensing, LLC	Active

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259276-US-7	US	9/25/2017	US15/713905	US10081258	9/25/2018	Method and apparatus for charging multiple energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
259276-US-8	US	8/17/2018	US16/104445	US10766372	9/8/2020	Method and apparatus for charging multiple energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
259276-US-9	US	12/20/2019	US16/723171	US11318852	5/3/2022	Method and apparatus for charging multiple energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
259278-BR-6	BR	5/10/2013	BR102013011666A	BR102013011666	12/29/2020	Contactor unit, method for operating an isolating contactor and system for isolating a first voltage device from a second voltage device	Dolby Intellectual Property Licensing, LLC	Active
259278-CN-4	CN	5/21/2013	CN201310189949A	CN103419615	7/7/2017	Contactor partition method and equipment	Dolby Intellectual Property Licensing, LLC	Active
259278-DE-7	DE	5/16/2013	EP13168098A	EP2667396	1/6/2016	Contactor isolation method and apparatus	Dolby Intellectual Property Licensing, LLC	Active
259278-FR-8	FR	5/16/2013	EP13168098A	EP2667396	1/6/2016	Contactor isolation method and apparatus	Dolby Intellectual Property Licensing, LLC	Active
259278-GB-9	GB	5/16/2013	EP13168098A	EP2667396	1/6/2016	Contactor isolation method and apparatus	Dolby Intellectual Property Licensing, LLC	Active
259278-IN-5	IN	4/23/2013	IN1188DE2013A	IN328615	1/3/2020	Contactor isolation method and apparatus	Dolby Intellectual Property Licensing, LLC	Active
259278-JP-2	JP	5/16/2013	JP2013103607A	JP6362832	7/25/2018	Contactor insulation method and apparatus	Dolby Intellectual Property Licensing, LLC	Active
259278-US-1	US	5/21/2012	US13/476188	US9142372	9/22/2015	Contactor isolation method and apparatus	Dolby Intellectual Property Licensing, LLC	Active
259306-US-1	US	11/30/2012	US13/689819	US9040019	5/26/2015	Methods of detecting myelin basic protein	Dolby Intellectual Property Licensing, LLC	Active
259392-US-1	US	4/13/2012	US13/446714	US8732456	5/20/2014	Enterprise environment disk encryption	Dolby Intellectual Property Licensing, LLC	Active
259422-BR-6	BR	6/6/2013	BR102013014032A	BR102013014032	4/26/2022	Electric drive device	Dolby Intellectual Property Licensing, LLC	Active
259422-CN-4	CN	6/7/2013	CN201310224017A	CN103490460	7/11/2017	For transmitting the system of the energy from the energy and manufacturing its method	Dolby Intellectual Property Licensing, LLC	Active
259422-EP-3	EP	6/6/2013	EP13170766A	EP2672600	12/11/2013	System for transferring energy from an energy source and method of making same	Dolby Intellectual Property Licensing, LLC	Active
259422-JP-2	JP	6/4/2013	JP2013117431A	JP6659203	3/4/2020	System for transferring energy from an energy source and method of manufacturing the same	Dolby Intellectual Property Licensing, LLC	Active
259422-US-1	US	6/7/2012	US13/490505	US9013168	4/21/2015	System for transferring energy from an energy source and method of making same	Dolby Intellectual Property Licensing, LLC	Active
260380-CN-1	CN	9/28/2012	CN201210370943A	CN103707748	3/1/2017	Power transmission system and drive system	Dolby Intellectual Property Licensing, LLC	Active
260416-CN-5	CN	10/11/2013	CN201380067381A	CN105143818	7/3/2018	Digital feeler gauge and its application method	Dolby Intellectual Property Licensing, LLC	Active
260416-DE-10	DE	10/11/2013	EP13783176A	EP2909578	12/18/2019	Digital feeler gauge	Dolby Intellectual Property Licensing, LLC	Active
260416-EP-7	EP	10/11/2013	EP13783176A	EP2909578	12/18/2019	Digital feeler gauge	Dolby Intellectual Property Licensing, LLC	Active
260416-FR-9	FR	10/11/2013	EP13783176A	EP2909578	12/18/2019	Digital feeler gauge	Dolby Intellectual Property Licensing, LLC	Active
260416-GB-11	GB	10/11/2013	EP13783176A	EP2909578	12/18/2019	Digital feeler gauge	Dolby Intellectual Property Licensing, LLC	Active

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260416-IN-6	IN	4/22/2015	IN2287CHN2015A	IN403125	8/12/2022	Digital feeler gauge and method of using same	Dolby Intellectual Property Licensing, LLC	Active
260416-JP-4	JP	10/11/2013	JP2015537745A	JP6329555	5/23/2018	Digital gap gauge and how to use it	Dolby Intellectual Property Licensing, LLC	Active
260416-KR-8	KR	10/11/2013	KR20157013053A	KR101912000	10/25/2018	Digital feeler gauge and method of using same	Dolby Intellectual Property Licensing, LLC	Active
260416-US-2	US	12/31/2012	US13/731929	US8919004	12/30/2014	Digital feeler gauge and method of using same	Dolby Intellectual Property Licensing, LLC	Active
260496-US-1	US	7/31/2012	US13/563111	US8962191	2/24/2015	Electrochemical cells having a electrode current collector extending into a positive electrode composition, and related methods	Dolby Intellectual Property Licensing, LLC	Active
260661-CN-2	CN	8/29/2013	CN201310383553A	CN103683524	10/17/2017	The contactless system of power transmission	Dolby Intellectual Property Licensing, LLC	Active
260661-DE-3	DE	8/29/2013	DE102013109382A	DE102013109382	3/13/2014	Non-contact energy transmission system	Dolby Intellectual Property Licensing, LLC	Active
260661-IN-1	IN	8/29/2012	IN3574CH2012A	IN346978	9/25/2020	Contactless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
260661-US-4	US	8/28/2013	US14/012245	US9697951	7/4/2017	Contactless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
260661-US-5	US	6/2/2017	US15/612324	US10490345	11/26/2019	Contactless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
260807-US-1	US	8/30/2012	US13/599469	US8988047	3/24/2015	Method of charging an electrochemical cell	Dolby Intellectual Property Licensing, LLC	Active
261519-CN-3	CN	11/13/2013	CN201310571078A	CN103928661	5/8/2018	Composition, energy storage device and relevant method	Dolby Intellectual Property Licensing, LLC	Active
261519-JP-4	JP	11/11/2013	JP2013232640A	JP6470901	2/13/2019	Composition, energy storage device and related processes	Dolby Intellectual Property Licensing, LLC	Active
261519-US-1	US	11/13/2012	US13/675061	US9257698	2/9/2016	Composition, energy storage device, and related process	Dolby Intellectual Property Licensing, LLC	Active
261528-BR-3	BR	9/23/2013	BR102013024325A	BR102013024325	4/26/2022	Power conversion system	Dolby Intellectual Property Licensing, LLC	Active
261528-CN-1	CN	9/24/2012	CN201210359161A	CN103684002	12/21/2016	Energy conversion system	Dolby Intellectual Property Licensing, LLC	Active
261528-IN-4	IN	9/16/2013	IN4150CH2013A	IN404705	9/2/2022	Power conversion system	Dolby Intellectual Property Licensing, LLC	Active
261528-JP-5	JP	9/17/2013	JP2013191274A	JP6496475	4/3/2019	Power conversion system	Dolby Intellectual Property Licensing, LLC	Active
261528-US-2	US	9/19/2013	US14/031778	US9537423	1/3/2017	Power conversion system	Dolby Intellectual Property Licensing, LLC	Active
261543-US-1	US	11/30/2012	US13/690644	US9368840	6/14/2016	Method for maintaining the performance level of an electrochemical cell	Dolby Intellectual Property Licensing, LLC	Active
261715-US-1	US	12/13/2012	US13/713745	US8977331	3/10/2015	Systems and methods for nerve imaging	Dolby Intellectual Property Licensing, LLC	Active
261939-US-1	US	12/28/2012	US13/729134	US9105896	8/11/2015	Metal rings for active brazing in sodium-based thermal batteries	Dolby Intellectual Property Licensing, LLC	Active
261949-US-1	US	12/26/2012	US13/726846	US9012060	4/21/2015	System and method for battery insulation	Dolby Intellectual Property Licensing, LLC	Active
262057-BR-2	BR	9/9/2013	BR102013023000A	BR102013023000	6/8/2021	Electric power supply apparatus	Dolby Intellectual Property Licensing, LLC	Active

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262057-EP-3	EP	9/24/2013	EP13185678A	EP2711233	3/26/2014	Power supply management apparatus and method thereof	Dolby Intellectual Property Licensing, LLC	Active
262057-IN-4	IN	8/27/2013	IN3793CH2013A	IN404774	9/2/2022	Power supply management apparatus and method thereof	Dolby Intellectual Property Licensing, LLC	Active
262057-JP-5	JP	9/20/2013	JP2013194766A	JP6881883	6/2/2021	A vehicle provided with an electric power supply control apparatus and an electric power supply control apparatus	Dolby Intellectual Property Licensing, LLC	Active
262057-US-6	US	9/17/2013	US14/028565	US10363823	7/30/2019	Power supply management apparatus and method thereof	Dolby Intellectual Property Licensing, LLC	Active
262057-US-7	US	6/12/2019	US16/439199	US11225150	1/18/2022	Power supply management apparatus and method thereof	Dolby Intellectual Property Licensing, LLC	Active
262115-AU-6	AU	8/1/2014	AU2014208262A	AU2014208262	9/12/2019	Apparatus and method for image super-resolution using integral shifting optics	Dolby Intellectual Property Licensing, LLC	Active
262115-BR-4	BR	7/31/2014	BR102014018911A	BR1020140188911	10/27/2020	Image capture device and method for acquiring images of an object by means of an image capture device	Dolby Intellectual Property Licensing, LLC	Active
262115-CA-5	CA	7/24/2014	CA2857714A	CA2857714	1/19/2021	Apparatus and method for image super-resolution using integral shifting optics	Dolby Intellectual Property Licensing, LLC	Active
262115-CN-3	CN	8/8/2014	CN201410388243A	CN104570382	11/5/2019	The device and method of optical image super-resolution are shifted using integral	Dolby Intellectual Property Licensing, LLC	Active
262115-DE-8	DE	8/1/2014	EP14179557A	EP2860574	9/30/2020	Apparatus and method for image super-resolution using integral shifting optics	Dolby Intellectual Property Licensing, LLC	Active
262115-EP-2	EP	8/1/2014	EP14179557A	EP2860574	9/30/2020	Apparatus and method for image super-resolution using integral shifting optics	Dolby Intellectual Property Licensing, LLC	Active
262115-FR-7	FR	8/1/2014	EP14179557A	EP2860574	9/30/2020	Apparatus and method for image super-resolution using integral shifting optics	Dolby Intellectual Property Licensing, LLC	Active
262115-GB-9	GB	8/1/2014	EP14179557A	EP2860574	9/30/2020	Apparatus and method for image super-resolution using integral shifting optics	Dolby Intellectual Property Licensing, LLC	Active
262115-US-1	US	10/9/2013	US14/049368	US9025067	5/5/2015	Apparatus and method for image super-resolution using integral shifting optics	Dolby Intellectual Property Licensing, LLC	Active
262665-US-1	US	6/22/2012	US13/530577	US9471515	10/18/2016	Systems, methods, and apparatus for medical device interface connectivity	Dolby Intellectual Property Licensing, LLC	Active
263576-CN-1	CN	3/29/2013	CN201310109147A	CN104079194	3/1/2017	Electric energy conversion system and method	Dolby Intellectual Property Licensing, LLC	Active
263939-US-3	US	10/29/2013	US14/066166	US9303549	4/5/2016	Engine cooling system and method for an engine	Dolby Intellectual Property Licensing, LLC	Active
264142-CN-1	CN	5/7/2013	CN201310164748A	CN104143832	8/24/2016	For collapse of voltage condition detection and the system and method for control	Dolby Intellectual Property Licensing, LLC	Active
264203-CN-1	CN	3/15/2013	CN201310084413A	CN104044484	3/27/2018	Drive system and driving method	Dolby Intellectual Property Licensing, LLC	Active
264203-DE-7	DE	3/14/2014	EP14160034A	EP2779413	7/7/2021	Drive system and method for driving a vehicle	Dolby Intellectual Property Licensing, LLC	Active
264203-EP-4	EP	3/14/2014	EP14160034A	EP2779413	7/7/2021	Drive system and method for driving a vehicle	Dolby Intellectual Property Licensing, LLC	Active
264203-JP-3	JP	3/14/2014	JP2014051022A	JP6548318	7/24/2019	Drive system and method for driving a vehicle	Dolby Intellectual Property Licensing, LLC	Active
264291-AU-4	AU	9/12/2013	AU2013315478A	AU2013315478	11/15/2018	System and method for generating semantic annotations	Dolby Intellectual Property Licensing, LLC	Active

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264291-CA-6	CA	9/12/2013	CA2884714A	CA2884714	5/22/2018	System and method for generating semantic annotations	Dolby Intellectual Property Licensing, LLC	Active
264291-CN-7	CN	9/12/2013	CN201380059257A	CN104781831	4/30/2019	System and method for generative semantics mark	Dolby Intellectual Property Licensing, LLC	Active
264291-JP-9	JP	9/12/2013	JP2015532040A	JP6307082	4/4/2018	System and method for generating semantic annotations	Dolby Intellectual Property Licensing, LLC	Active
264291-KR-10	KR	9/12/2013	KR20157008947A	KR101890467	8/21/2018	System and method for generating semantic annotations	Dolby Intellectual Property Licensing, LLC	Active
264291-US-2	US	6/15/2013	US13/918905	US9251421	2/2/2016	System and method for generating semantic annotations	Dolby Intellectual Property Licensing, LLC	Active
264323A-US-1	US	11/2/2013	US14/070511	US9360528	6/7/2016	Method and system for voltage sense input	Dolby Intellectual Property Licensing, LLC	Active
264323-US-2	US	11/2/2013	US14/070505	US10060984	8/28/2018	Battery management systems and methods	Dolby Intellectual Property Licensing, LLC	Active
264353-US-1	US	12/7/2012	US13/708107	US8889241	11/18/2014	Stacked film reflective layers for multi-layer optical data storage	Dolby Intellectual Property Licensing, LLC	Active
264353-US-4	US	11/17/2014	US14/543438	US9099104	8/4/2015	Stacked film reflective layers for multi-layer optical data storage	Dolby Intellectual Property Licensing, LLC	Active
264428-BR-6	BR	3/14/2014	BR102014006100A	BR102014006100	7/5/2016	Appliance and vehicle	Dolby Intellectual Property Licensing, LLC	Active
264428-CN-1	CN	3/15/2013	CN201310084090A	CN104044475	7/11/2017	Improved drive system and the device using the drive system	Dolby Intellectual Property Licensing, LLC	Active
264428-DE-7	DE	3/14/2014	EP14160004A	EP2777974	2/27/2019	Electric vehicle with improved electric drive system	Dolby Intellectual Property Licensing, LLC	Active
264428-EP-4	EP	3/14/2014	EP14160004A	EP2777974	2/27/2019	Electric vehicle with improved electric drive system	Dolby Intellectual Property Licensing, LLC	Active
264428-IN-5	IN	3/12/2014	IN1284CH2014A	IN378944	10/15/2021	Electric vehicle with improved electric drive system	Dolby Intellectual Property Licensing, LLC	Active
264428-JP-3	JP	3/12/2014	JP2014048291A	JP6352655	7/4/2018	Electric vehicle with improved electric drive system	Dolby Intellectual Property Licensing, LLC	Active
264428-US-2	US	3/10/2014	US14/202506	US9780702	10/3/2017	Electric vehicle with improved electric drive system	Dolby Intellectual Property Licensing, LLC	Active
264800-US-1	US	6/6/2013	US13/912050	US9078862	7/14/2015	Platelet activation using long electric field pulses	Dolby Intellectual Property Licensing, LLC	Active
264801-US-1	US	6/6/2013	US13/911987	US9238808	1/19/2016	Modular adjustable pulse generator	Dolby Intellectual Property Licensing, LLC	Active
264901-US-1	US	12/26/2012	US13/727019	US9465080	10/11/2016	System and method for prognosis of batteries	Dolby Intellectual Property Licensing, LLC	Active
265319-CN-4	CN	11/20/2014	CN201410670323A	CN104659895	11/15/2019	For using the equipment and its manufacturing method of vehicle power electronic device quick charge	Dolby Intellectual Property Licensing, LLC	Active
265319-DE-6	DE	11/19/2014	EP14193904A	EP2875984	8/2/2023	Apparatus for rapid charging using onboard power electronics and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
265319-EP-3	EP	11/19/2014	EP14193904A	EP2875984	8/2/2023	Apparatus for rapid charging using onboard power electronics and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
265319-IN-5	IN	7/23/2014	IN5693CHN2014A	IN304209	12/14/2018	A method and a system for monitoring and control of	Dolby Intellectual Property Licensing, LLC	Active
265319-JP-2	JP	11/17/2014	JP2014232280A	JP6467198	2/6/2019	Device for rapid charging using in-vehicle power electronics and method of manufacturing the same	Dolby Intellectual Property Licensing, LLC	Active

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265319-US-1	US	11/20/2013	US14/085313	US9238415	1/19/2016	Apparatus for rapid charging using onboard power electronics and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
265379-US-1	US	7/31/2013	US13/955413	US9692045	6/27/2017	Porous absorbent for sodium metal halide cells	Dolby Intellectual Property Licensing, LLC	Active
265379-US-2	US	7/31/2013	US13/955476	US10033069	7/24/2018	Porous absorbent for sodium metal halide cells	Dolby Intellectual Property Licensing, LLC	Active
265452-US-1	US	6/26/2013	US13/927543	US8912512	12/16/2014	System and method for optical biopsy tissue characterization	Joint ownership - Dolby Intellectual Property Licensing, LLC and Memorial Sloan Kettering Cancer Center	Active
265784-BR-4	BR	8/4/2014	BR102014019219A	BR102014019219	8/10/2021	Internal permanent magnet machine and method for arranging together an internal permanent magnet machine	Dolby Intellectual Property Licensing, LLC	Active
265784-CN-3	CN	8/5/2014	CN201410616305A	CN104393730	1/18/2019	Spoke permanent magnetic motor and its manufacturing method with reduced torque ripple	Dolby Intellectual Property Licensing, LLC	Active
265784-DE-9	DE	7/31/2014	EP14179274A	EP2840692	12/23/2020	Spoke permanent magnet machine with reduced torque ripple and method of manufacturing thereof	Dolby Intellectual Property Licensing, LLC	Active
265784-EP-2	EP	7/31/2014	EP14179274A	EP2840692	12/23/2020	Spoke permanent magnet machine with reduced torque ripple and method of manufacturing thereof	Dolby Intellectual Property Licensing, LLC	Active
265784-FR-8	FR	7/31/2014	EP14179274A	EP2840692	12/23/2020	Spoke permanent magnet machine with reduced torque ripple and method of manufacturing thereof	Dolby Intellectual Property Licensing, LLC	Active
265784-GB-11	GB	7/31/2014	EP14179274A	EP2840692	12/23/2020	Spoke permanent magnet machine with reduced torque ripple and method of manufacturing thereof	Dolby Intellectual Property Licensing, LLC	Active
265784-KR-6	KR	8/4/2014	KR20140099747A	KR101911978	10/25/2018	Spoke permanent magnet machine with reduced torque ripple and method of manufacturing thereof	Dolby Intellectual Property Licensing, LLC	Active
265784-NL-10	NL	7/31/2014	EP14179274A	EP2840692	12/23/2020	Spoke permanent magnet machine with reduced torque ripple and method of manufacturing thereof	Dolby Intellectual Property Licensing, LLC	Active
265784-US-1	US	8/5/2013	US13/958693	US9287742	3/15/2016	Spoke permanent magnet machine with reduced torque ripple and method of manufacturing thereof	Dolby Intellectual Property Licensing, LLC	Active
265951-CN-5	CN	10/26/2015	CN201580065801A	CN107004541	12/17/2019	Multi-channel relay assembly with in-line mems switches	Dolby Intellectual Property Licensing, LLC	Active
265951-EP-6	EP	10/26/2015	EP15791159A	EP3227899	10/11/2017	Multichannel relay assembly with in line mems switches	Dolby Intellectual Property Licensing, LLC	Active
265951-KR-10	KR	10/26/2015	KR20237015032A	KR20230065386	5/11/2023	Multichannel relay assembly with in line mems switches	Dolby Intellectual Property Licensing, LLC	Active
265951-SG-9	SG	10/26/2015	SG11201704153RA	SG11201704153R	6/29/2017	Multichannel relay assembly with in line mems switches	Dolby Intellectual Property Licensing, LLC	Active
265951-TW-3	TW	11/19/2015	TW104138310A	TWI695398	6/1/2020	Multichannel relay assembly with in line mems switches	Dolby Intellectual Property Licensing, LLC	Active
265951-US-1	US	12/3/2014	US14/558990	US9362608	6/7/2016	Multichannel relay assembly with in line mems switches	Dolby Intellectual Property Licensing, LLC	Active
266269-BR-2	BR	10/17/2014	BR102014025977A	BR102014025977	8/3/2021	Electric machine and vehicle	Dolby Intellectual Property Licensing, LLC	Active
266269-KR-6	KR	10/17/2014	KR20140140921A	KR101996687	7/4/2019	Torque ripple reduction in electric machines	Dolby Intellectual Property Licensing, LLC	Active
266269-US-1	US	10/18/2013	US14/057591	US9742228	8/22/2017	Torque ripple reduction in electric machines	Dolby Intellectual Property Licensing, LLC	Active
266271-CN-2	CN	11/5/2014	CN201410615389A	CN104618320	7/9/2019	System and method for implementation of file transfer	Dolby Intellectual Property Licensing, LLC	Active

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266271-DE-5	DE	11/3/2014	EP14191515A	EP2869529	8/31/2016	Systems and methods for secure file transfers	Dolby Intellectual Property Licensing, LLC	Active
266271-FR-6	FR	11/3/2014	EP14191515A	EP2869529	8/31/2016	Systems and methods for secure file transfers	Dolby Intellectual Property Licensing, LLC	Active
266271-GB-7	GB	11/3/2014	EP14191515A	EP2869529	8/31/2016	Systems and methods for secure file transfers	Dolby Intellectual Property Licensing, LLC	Active
266271-JP-4	JP	10/29/2014	JP2014219873A	JP6496522	4/3/2019	System and method for secure file transfer	Dolby Intellectual Property Licensing, LLC	Active
266271-US-1	US	11/5/2013	US14/072425	US9306915	4/5/2016	Systems and methods for secure file transfers	Dolby Intellectual Property Licensing, LLC	Active
266953-CN-1	CN	8/1/2013	CN201310331899A	CN104348199	3/1/2017	Battery management system and method	Dolby Intellectual Property Licensing, LLC	Active
266953-JP-3	JP	7/25/2014	JP2014151392A	JP6356518	7/11/2018	Battery management system and method	Dolby Intellectual Property Licensing, LLC	Active
266953-US-2	US	7/2/2014	US14/321935	US9455580	9/27/2016	Battery management system and method	Dolby Intellectual Property Licensing, LLC	Active
266980-US-1	US	12/28/2012	US13/729343	US9028997	5/12/2015	Ceramic collars for active brazing in sodium-based thermal batteries	Dolby Intellectual Property Licensing, LLC	Active
267009-US-1	US	9/27/2013	US14/039497	US9999352	6/19/2018	System and method for determining a hydration level of a tissue region	Dolby Intellectual Property Licensing, LLC	Active
267101-CN-4	CN	11/5/2014	CN201410858234A	CN104618341	12/27/2019	System and method for secure remote access	Dolby Intellectual Property Licensing, LLC	Active
267101-DE-6	DE	11/5/2014	EP14191891A	EP2869530	5/4/2022	Systems and methods for secure remote access	Dolby Intellectual Property Licensing, LLC	Active
267101-EP-2	EP	11/5/2014	EP14191891A	EP2869530	5/4/2022	Systems and methods for secure remote access	Dolby Intellectual Property Licensing, LLC	Active
267101-FR-5	FR	11/5/2014	EP14191891A	EP2869530	5/4/2022	Systems and methods for secure remote access	Dolby Intellectual Property Licensing, LLC	Active
267101-GB-7	GB	11/5/2014	EP14191891A	EP2869530	5/4/2022	Systems and methods for secure remote access	Dolby Intellectual Property Licensing, LLC	Active
267101-JP-3	JP	10/29/2014	JP2014219874A	JP6416585	10/31/2018	System and method for secure remote access	Dolby Intellectual Property Licensing, LLC	Active
267101-US-1	US	11/5/2013	US14/072414	US9191368	11/17/2015	Systems and methods for secure remote access	Dolby Intellectual Property Licensing, LLC	Active
267351-CA-2	CA	7/10/2014	CA2856487A	CA2856487	11/16/2021	Systems and methods for data loss prevention	Dolby Intellectual Property Licensing, LLC	Active
267351-JP-4	JP	7/11/2014	JP2014143007A	JP6587790	10/9/2019	System and method for data loss prevention	Dolby Intellectual Property Licensing, LLC	Active
267351-US-1	US	7/15/2013	US13/942318	US10346616	7/9/2019	Systems and methods for data loss prevention	Dolby Intellectual Property Licensing, LLC	Active
267632-US-1	US	4/25/2014	US14/262144	US9748767	8/29/2017	System and method for hybrid energy conversion	Dolby Intellectual Property Licensing, LLC	Active
267632-US-2	US	8/10/2017	US15/673520	US10431978	10/1/2019	System and method for hybrid energy conversion	Dolby Intellectual Property Licensing, LLC	Active
267788-CN-1	CN	10/11/2013	CN201310472988A	CN104553838	3/1/2017	Propulsion system	Dolby Intellectual Property Licensing, LLC	Active
267788-JP-3	JP	10/10/2014	JP2014208468A	JP6749742	9/2/2020	Propulsion system and vehicle driving method	Dolby Intellectual Property Licensing, LLC	Active

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267788-US-2	US	10/10/2014	US14/511362	US9895983	2/20/2018	Propulsion system and method for driving a vehicle	Dolby Intellectual Property Licensing, LLC	Active
267819-CN-4	CN	7/24/2014	CN201410354403A	CN104348269	4/2/2019	System and method for the field spider in equating motor	Dolby Intellectual Property Licensing, LLC	Active
267819-DE-6	DE	7/17/2014	EP14177512A	EP2840678	7/7/2021	System and method for smoothing a salient rotor in electrical machines	Dolby Intellectual Property Licensing, LLC	Active
267819-EP-3	EP	7/17/2014	EP14177512A	EP2840678	7/7/2021	System and method for smoothing a salient rotor in electrical machines	Dolby Intellectual Property Licensing, LLC	Active
267819-JP-2	JP	7/18/2014	JP2014147258A	JP6475431	2/27/2019	System and method for smoothing a protruding rotor of an electric machine	Dolby Intellectual Property Licensing, LLC	Active
267819-US-1	US	7/24/2013	US13/949406	US9520751	12/13/2016	System and method for smoothing a salient rotor in electrical machines	Dolby Intellectual Property Licensing, LLC	Active
267847-CA-3	CA	7/18/2014	CA2857244A	CA2857244	8/15/2017	Isolated battery management systems and methods thereof	Dolby Intellectual Property Licensing, LLC	Active
267847-CN-4	CN	7/24/2014	CN201410354637A	CN104348221	6/13/2017	Isolation battery management system and its method	Dolby Intellectual Property Licensing, LLC	Active
267847-DE-6	DE	7/21/2014	EP14177828A	EP2830182	9/6/2017	Isolated battery management systems and methods thereof	Dolby Intellectual Property Licensing, LLC	Active
267847-FR-8	FR	7/21/2014	EP14177828A	EP2830182	9/6/2017	Isolated battery management systems and methods thereof	Dolby Intellectual Property Licensing, LLC	Active
267847-GB-9	GB	7/21/2014	EP14177828A	EP2830182	9/6/2017	Isolated battery management systems and methods thereof	Dolby Intellectual Property Licensing, LLC	Active
267847-IT-7	IT	7/21/2014	EP14177828A	EP2830182	9/6/2017	Isolated battery management systems and methods thereof	Dolby Intellectual Property Licensing, LLC	Active
267847-JP-5	JP	7/22/2014	JP2014148432A	JP5890868	3/22/2016	Insulated battery management system and method	Dolby Intellectual Property Licensing, LLC	Active
267847-US-1	US	7/24/2013	US13/949567	US9318893	4/19/2016	Isolated battery management systems and methods thereof	Dolby Intellectual Property Licensing, LLC	Active
267895-CN-1	CN	1/27/2014	CN201410038726A	CN104811064	7/3/2020	Energy conversion system, photovoltaic energy conversion system and method	Dolby Intellectual Property Licensing, LLC	Active
268047-JP-3	JP	8/13/2014	JP2014164626A	JP6636238	1/29/2020	Plasmon interface and its manufacturing method	Dolby Intellectual Property Licensing, LLC	Active
268047-TW-4	TW	8/7/2014	TW103127087A	TWI657278	4/21/2019	Plasmonic interface and method of manufacturing thereof	Dolby Intellectual Property Licensing, LLC	Active
268047-US-1	US	8/20/2013	US13/970852	US9465160	10/11/2016	Plasmonic interface and method of manufacturing thereof	Dolby Intellectual Property Licensing, LLC	Active
268102-DE-6	DE	7/23/2014	EP14178108A	EP2830186	12/6/2017	Battery heater systems and methods	Dolby Intellectual Property Licensing, LLC	Active
268102-FR-7	FR	7/23/2014	EP14178108A	EP2830186	12/6/2017	Battery heater systems and methods	Dolby Intellectual Property Licensing, LLC	Active
268102-GB-8	GB	7/23/2014	EP14178108A	EP2830186	12/6/2017	Battery heater systems and methods	Dolby Intellectual Property Licensing, LLC	Active
268102-IT-9	IT	7/23/2014	EP14178108A	EP2830186	12/6/2017	Battery heater systems and methods	Dolby Intellectual Property Licensing, LLC	Active
268102-KR-5	KR	7/25/2014	KR20140094717A	KR102219244	2/23/2021	Battery heater systems and methods	Dolby Intellectual Property Licensing, LLC	Active
268134-US-1	US	2/14/2013	US13/767066	US9028998	5/12/2015	Battery cell design and method of cooling battery cells	Dolby Intellectual Property Licensing, LLC	Active

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268409-US-1	US	10/16/2013	US14/055024	US9685904	6/20/2017	Photovoltaic system with improved dc connections and method of making same	Dolby Intellectual Property Licensing, LLC	Active
268409-US-2	US	10/16/2013	US14/055042	US9893678	2/13/2018	Photovoltaic system with improved ac connections and method of making same	Dolby Intellectual Property Licensing, LLC	Active
268409-US-3	US	5/24/2017	US15/604066	US10812015	10/20/2020	Micro-inverter assembly for use in a photovoltaic system and method of making same	Dolby Intellectual Property Licensing, LLC	Active
269204-CN-1	CN	10/25/2013	CN201310512240A	CN104554074	9/15/2017	Vehicle control system	Dolby Intellectual Property Licensing, LLC	Active
269204-JP-3	JP	10/21/2014	JP2014214125A	JP6496518	4/3/2019	Vehicle control system	Dolby Intellectual Property Licensing, LLC	Active
269204-US-2	US	10/15/2014	US14/514957	US9517696	12/13/2016	Vehicle control system	Dolby Intellectual Property Licensing, LLC	Active
269205-CN-1	CN	9/18/2013	CN201310429818A	CN104442412	1/19/2018	Device, mobile transporting equipment, electric tractor, electri forklift and associated method	Dolby Intellectual Property Licensing, LLC	Active
269205-DE-6	DE	9/17/2014	EP14185231A	EP2853459	6/17/2020	Apparatus, vehicle, and method for operating vehicle	Dolby Intellectual Property Licensing, LLC	Active
269205-EP-5	EP	9/17/2014	EP14185231A	EP2853459	6/17/2020	Apparatus, vehicle, and method for operating vehicle	Dolby Intellectual Property Licensing, LLC	Active
269205-IN-4	IN	9/17/2014	IN4524CH2014A	IN437465	7/7/2023	Apparatus, vehicle and method for operating vehicle	Dolby Intellectual Property Licensing, LLC	Active
269545-DE-9	DE	9/4/2014	EP14772495A	EP3055976	2/6/2019	Methods and systems for a universal wireless platform for asset monitoring	Dolby Intellectual Property Licensing, LLC	Active
269545-EP-4	EP	9/4/2014	EP14772495A	EP3055976	2/6/2019	Methods and systems for a universal wireless platform for asset monitoring	Dolby Intellectual Property Licensing, LLC	Active
269545-FR-8	FR	9/4/2014	EP14772495A	EP3055976	2/6/2019	Methods and systems for a universal wireless platform for asset monitoring	Dolby Intellectual Property Licensing, LLC	Active
269545-GB-10	GB	9/4/2014	EP14772495A	EP3055976	2/6/2019	Methods and systems for a universal wireless platform for asset monitoring	Dolby Intellectual Property Licensing, LLC	Active
269545-KR-6	KR	9/4/2014	KR20167011606A	KR101984363	5/30/2019	Methods and systems for a universal wireless platform for asset monitoring	Dolby Intellectual Property Licensing, LLC	Active
269545-TW-3	TW	9/25/2014	TW103133301A	TWI664588	7/1/2019	Systems for a universal wireless platform for asset monitoring	Dolby Intellectual Property Licensing, LLC	Active
269545-US-1	US	10/8/2013	US14/048930	US9870690	1/16/2018	Methods and systems for a universal wireless platform for asset monitoring	Dolby Intellectual Property Licensing, LLC	Active
269575-AU-21	AU	7/22/2020	AU2020207831A	AU2020207831	1/13/2022	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-AU-4	AU	1/9/2015	AU2015206756A	AU2015206756	5/14/2020	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-BR-5	BR	1/9/2015	112016014953-0	N/A	9/12/2023		Dolby Intellectual Property Licensing, LLC	Active
269575-CA-6	CA	1/9/2015	CA2936230A	CA2936230	6/14/2022	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-CN-7	CN	1/9/2015	CN201580004722A	CN105899949	9/3/2019	Use the platelet activation and growth factor release of electric pulse	Dolby Intellectual Property Licensing, LLC	Active
269575-DE-18	DE	1/9/2015	EP15701451A	EP3094970	3/6/2019	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-DE-23	DE	1/9/2015	EP18210654A	EP3502690	9/7/2022	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active

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269575-EP-16	EP	1/9/2015	EP18210654A	EP3502690	9/7/2022	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-EP-8	EP	1/9/2015	EP15701451A	EP3094970	3/6/2019	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-ES-25	ES	1/9/2015	EP18210654A	EP3502690	9/7/2022	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-FR-17	FR	1/9/2015	EP15701451A	EP3094970	3/6/2019	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-FR-22	FR	1/9/2015	EP18210654A	EP3502690	9/7/2022	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-GB-19	GB	1/9/2015	EP15701451A	EP3094970	3/6/2019	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-GB-26	GB	1/9/2015	EP18210654A	EP3502690	9/7/2022	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-IN-9	IN	7/19/2016	IN201647024005A	IN412195	11/25/2022	Platelet activation and growth factor release using	Dolby Intellectual Property Licensing, LLC	Active
269575-IT-24	IT	1/9/2015	EP18210654A	EP3502690	9/7/2022	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-JP-10	JP	1/9/2015	JP2016545972A	JP6625542	12/25/2019	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-KR-11	KR	1/9/2015	KR20167021523A	KR102277931	7/15/2021	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-MX-12	MX	1/9/2015	MX2016009316A	MX2016009316	10/13/2016	Platelet activation and growth factor release using electric pulses.	Dolby Intellectual Property Licensing, LLC	Active
269575-RU-13	RU	1/9/2015	RU2016126427A	RU2712234	1/27/2020	Thrombocyte activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-TW-3	TW	1/7/2015	TW104100402A	TWI673054	10/1/2019	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-US-1	US	1/17/2014	US14/157819	US9452199	9/27/2016	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-US-14	US	8/30/2016	US15/252032	US10369200	8/6/2019	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-US-15	US	8/30/2016	US15/251990	US10383915	8/20/2019	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-US-20	US	7/17/2019	US16/514662	US11464829	10/11/2022	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269575-US-27	US	9/28/2022	US17/936162	US12042526	7/23/2024	Platelet activation and growth factor release using electric pulses	Dolby Intellectual Property Licensing, LLC	Active
269603-AU-12	AU	11/20/2014	AU2014377586A	AU2014377586	5/28/2020	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603A-US-1	US	4/17/2018	US15/955377	US10421956	9/24/2019	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603A-US-2	US	8/12/2019	US16/538616	US11525768	12/13/2022	Electric pulse generation system using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-BR-7	BR	11/20/2014	BR112016015394A	BR112016015394	1/12/2021	Electric pulse generation system	Dolby Intellectual Property Licensing, LLC	Active
269603-CA-6	CA	11/20/2014	CA2936197A	CA2936197	4/25/2023	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
269603-CN-19	CN	11/20/2014	CN202110196663A	CN113088444	7/9/2021	Electric pulse generating system using capacitance coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-DE-16	DE	11/20/2014	EP14815988A	EP3094969	9/11/2019	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-EP-4	EP	11/20/2014	EP14815988A	EP3094969	9/11/2019	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-FR-15	FR	11/20/2014	EP14815988A	EP3094969	9/11/2019	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-GB-17	GB	11/20/2014	EP14815988A	EP3094969	9/11/2019	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-IN-11	IN	7/15/2016	IN201647024253A	IN424532	3/10/2023	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-JP-9	JP	11/20/2014	JP2016544865A	JP6573617	9/11/2019	Electric pulse generation system using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-KR-13	KR	11/20/2014	KR20167021404A	KR102213731	2/8/2021	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-KR-18	KR	11/20/2014	KR20217002961A	KR102255951	5/25/2021	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-MX-8	MX	11/20/2014	MX2016009314A	MX2016009314	10/13/2016	Electric pulse generation systems using capacitive coupling.	Dolby Intellectual Property Licensing, LLC	Active
269603-RU-5	RU	11/20/2014	RU2016127559A	RU2709822	12/23/2019	Electrical pulses generation system using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-TW-3	TW	12/26/2014	TW103145805A	TWI673033	10/1/2019	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-US-1	US	1/17/2014	US14/158106	US9708597	7/18/2017	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269603-US-14	US	7/17/2017	US15/651900	US10329551	6/25/2019	Electric pulse generation systems using capacitive coupling	Dolby Intellectual Property Licensing, LLC	Active
269676-BR-6	BR	10/8/2014	BR102014025123A	BR102014025123	7/13/2021	Ferrite permanent magnet electric machine, method for heating a permanent magnet magnet electric machine and permanent magnet machine	Dolby Intellectual Property Licensing, LLC	Active
269676-CN-3	CN	10/24/2014	CN201410573904A	CN104578651	9/21/2018	For the system and method for low-temperature heat ferrite magnet motor	Dolby Intellectual Property Licensing, LLC	Active
269676-DE-9	DE	10/24/2014	EP14190298A	EP2866334	10/24/2018	System and method for heating ferrite magnet motors for low temperatures	Dolby Intellectual Property Licensing, LLC	Active
269676-EP-2	EP	10/24/2014	EP14190298A	EP2866334	10/24/2018	System and method for heating ferrite magnet motors for low temperatures	Dolby Intellectual Property Licensing, LLC	Active
269676-FR-8	FR	10/24/2014	EP14190298A	EP2866334	10/24/2018	System and method for heating ferrite magnet motors for low temperatures	Dolby Intellectual Property Licensing, LLC	Active
269676-GB-10	GB	10/24/2014	EP14190298A	EP2866334	10/24/2018	System and method for heating ferrite magnet motors for low temperatures	Dolby Intellectual Property Licensing, LLC	Active
269676-JP-5	JP	10/21/2014	JP2014214126A	JP6541145	7/10/2019	System and method for heating a low temperature ferrite magnet motor	Dolby Intellectual Property Licensing, LLC	Active
269676-KR-4	KR	10/24/2014	KR20140145400A	KR102302513	9/17/2021	System and method for heating ferrite magnet motors for low temperatures	Dolby Intellectual Property Licensing, LLC	Active
269676-US-1	US	10/25/2013	US14/063547	US9698660	7/4/2017	System and method for heating ferrite magnet motors for low temperatures	Dolby Intellectual Property Licensing, LLC	Active
269676-US-7	US	5/5/2017	US15/588044	US9966897	5/8/2018	System and method for heating ferrite magnet motors for low temperatures	Dolby Intellectual Property Licensing, LLC	Active

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269695-CN-5	CN	10/8/2014	CN201410525151A	CN104517178	12/20/2022	Method and system for dynamic workflow priority determination and task allocation	Dolby Intellectual Property Licensing, LLC	Active
269695-DE-7	DE	10/1/2014	EP14187291A	EP2860987	9/30/2020	Methods and systems for dynamic workflow prioritization and tasking	Dolby Intellectual Property Licensing, LLC	Active
269695-EP-2	EP	10/1/2014	EP14187291A	EP2860987	9/30/2020	Methods and systems for dynamic workflow prioritization and tasking	Dolby Intellectual Property Licensing, LLC	Active
269695-FR-6	FR	10/1/2014	EP14187291A	EP2860987	9/30/2020	Methods and systems for dynamic workflow prioritization and tasking	Dolby Intellectual Property Licensing, LLC	Active
269695-GB-8	GB	10/1/2014	EP14187291A	EP2860987	9/30/2020	Methods and systems for dynamic workflow prioritization and tasking	Dolby Intellectual Property Licensing, LLC	Active
269695-JP-3	JP	10/3/2014	JP2014204374A	JP6467181	2/6/2019	Method and system for dynamic workflow prioritization and tasking	Dolby Intellectual Property Licensing, LLC	Active
269695-KR-4	KR	10/7/2014	KR20140134902A	KR102238059	4/8/2021	Methods and systems for dynamic workflow prioritization and tasking	Dolby Intellectual Property Licensing, LLC	Active
269695-US-1	US	10/8/2013	US14/048934	US10437203	10/8/2019	Methods and systems for dynamic workflow prioritization and tasking	Dolby Intellectual Property Licensing, LLC	Active
269823-CN-3	CN	8/28/2015	CN201510765021A	CN105391372	8/18/2020	Magnet management in an electric machine	Dolby Intellectual Property Licensing, LLC	Active
269823-DE-6	DE	8/27/2015	EP15182787A	EP2991220	10/12/2022	Magnet management in electric machines	Dolby Intellectual Property Licensing, LLC	Active
269823-EP-2	EP	8/27/2015	EP15182787A	EP2991220	10/12/2022	Magnet management in electric machines	Dolby Intellectual Property Licensing, LLC	Active
269823-JP-4	JP	8/26/2015	JP2015166313A	JP7130351	9/5/2022	Magnet management in electric machines	Dolby Intellectual Property Licensing, LLC	Active
269823-KR-5	KR	8/28/2015	KR20150121854A	KR101983428	5/28/2019	Magnet management in electrical machines	Dolby Intellectual Property Licensing, LLC	Active
269823-US-1	US	8/29/2014	US14/473216	US9602043	3/21/2017	Magnet management in electric machines	Dolby Intellectual Property Licensing, LLC	Active
269935-US-1	US	6/26/2013	US13/927683	US9216010	12/22/2015	System and method for aligning a biopsy collecting device	Joint ownership - Dolby Intellectual Property Licensing, LLC and Memorial Sloan Kettering Cancer Center	Active
270277-US-1	US	7/26/2013	US13/952317	US9362537	6/7/2016	Electrochemical cells, and related energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
270450-US-1	US	9/22/2014	US14/492170	US9385627	7/5/2016	Universal power conversion devices for alternating current electric apparatus	Dolby Intellectual Property Licensing, LLC	Active
271055-IT-6	IT	4/30/2015	1.02015E+14	N/A	9/25/2017		Dolby Intellectual Property Licensing, LLC	Active
271055-JP-2	JP	5/14/2015	JP2015098658A	JP6722426	7/15/2020	Thermal clamp device for electronic system	Dolby Intellectual Property Licensing, LLC	Active
271055-TW-5	TW	5/11/2015	TW104114895A	TWI663894	6/21/2019	Electronic device and method for removing heat from an electronic device	Dolby Intellectual Property Licensing, LLC	Active
271055-US-1	US	5/23/2014	US14/285720	US9668334	5/30/2017	Thermal clamp apparatus for electronic systems	Dolby Intellectual Property Licensing, LLC	Active
271087-US-1	US	7/1/2014	US14/321072	US9806380	10/31/2017	High temperature electrochemical cell structures, and methods for making	Dolby Intellectual Property Licensing, LLC	Active
271261-DE-8	DE	5/22/2015	EP15168809A	EP2947062	2/17/2021	Method for joining ceramic to metal	Dolby Intellectual Property Licensing, LLC	Active
271261-EP-5	EP	5/22/2015	EP15168809A	EP2947062	2/17/2021	Method for joining ceramic to metal	Dolby Intellectual Property Licensing, LLC	Active

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271261-FR-7	FR	5/22/2015	EP15168809A	EP2947062	2/17/2021	Method for joining ceramic to metal	Dolby Intellectual Property Licensing, LLC	Active
271261-GB-10	GB	5/22/2015	EP15168809A	EP2947062	2/17/2021	Method for joining ceramic to metal	Dolby Intellectual Property Licensing, LLC	Active
271261-IN-1	IN	5/23/2014	IN2308CHE2014A	IN322482	10/11/2019	Method for joining ceramic to metal, and sealing	Dolby Intellectual Property Licensing, LLC	Active
271261-IT-9	IT	5/22/2015	EP15168809A	EP2947062	2/17/2021	Method for joining ceramic to metal	Dolby Intellectual Property Licensing, LLC	Active
271261-JP-4	JP	5/19/2015	JP2015101614A	JP6480806	3/13/2019	Method for bonding ceramic and metal and sealing structure thereof	Dolby Intellectual Property Licensing, LLC	Active
271261-KR-6	KR	5/22/2015	KR20150072036A	KR102398188	5/17/2022	Method for joining ceramic to metal, and sealing structure thereof	Dolby Intellectual Property Licensing, LLC	Active
271261-US-2	US	5/22/2015	US14/719742	US10103410	10/16/2018	Method for joining ceramic to metal, and sealing structure thereof	Dolby Intellectual Property Licensing, LLC	Active
271359-CN-1	CN	12/8/2014	CN201410747549A	CN105730257	5/22/2018	Propulsion system, energy management system and method	Dolby Intellectual Property Licensing, LLC	Active
271359-JP-2	JP	12/2/2015	JP2015235294A	JP6769706	10/14/2020	Propulsion system and energy management system and their methods	Dolby Intellectual Property Licensing, LLC	Active
271359-US-3	US	12/8/2015	US14/962332	US9643513	5/9/2017	Propelling system and energy management system and methods	Dolby Intellectual Property Licensing, LLC	Active
271380-US-1	US	10/7/2014	US14/507908	US9837654	12/5/2017	Power connector for a battery management system	Dolby Intellectual Property Licensing, LLC	Active
271404-US-1	US	7/7/2014	US14/324755	US9269028	2/23/2016	System and method for determining string similarity	Dolby Intellectual Property Licensing, LLC	Active
271471-CN-1	CN	10/27/2014	CN201410582236A	CN105634229	1/8/2019	Magneto	Dolby Intellectual Property Licensing, LLC	Active
271474-CN-3	CN	7/21/2016	CN201680051061A	CN107925138	5/11/2021	Energy storage device with reduced temperature variability between batteries	Dolby Intellectual Property Licensing, LLC	Active
271474-DE-7	DE	7/21/2016	EP16745353A	EP3345243	1/27/2021	Energy storage device with reduced temperature variability between cells	Dolby Intellectual Property Licensing, LLC	Active
271474-EP-4	EP	7/21/2016	EP16745353A	EP3345243	1/27/2021	Energy storage device with reduced temperature variability between cells	Dolby Intellectual Property Licensing, LLC	Active
271474-FR-6	FR	7/21/2016	EP16745353A	EP3345243	1/27/2021	Energy storage device with reduced temperature variability between cells	Dolby Intellectual Property Licensing, LLC	Active
271474-GB-8	GB	7/21/2016	EP16745353A	EP3345243	1/27/2021	Energy storage device with reduced temperature variability between cells	Dolby Intellectual Property Licensing, LLC	Active
271474-IN-5	IN	3/16/2018	IN201847009747A	IN406407	9/16/2022	Energy storage device with reduced temperature	Dolby Intellectual Property Licensing, LLC	Active
271474-US-1	US	9/2/2015	US14/843164	US9806387	10/31/2017	Energy storage device with reduced temperature variability between cells	Dolby Intellectual Property Licensing, LLC	Active
271785-US-1	US	12/16/2014	US14/572216	US9548518	1/17/2017	Methods for joining ceramic and metallic structures	Dolby Intellectual Property Licensing, LLC	Active
272354-US-2	US	12/19/2013	US14/133967	US9255779	2/9/2016	Wireless taper gauge and method of using same	Dolby Intellectual Property Licensing, LLC	Active
272442-CN-2	CN	7/22/2015	CN201510432791A	CN105322739	8/27/2019	The system and method for preventing stator permanent magnet from demagnetizing during vacuum pressure impregnation	Dolby Intellectual Property Licensing, LLC	Active
272442-DE-7	DE	7/20/2015	EP15177470A	EP2978111	11/18/2020	System and method for preventing stator permanent magnet demagnetization during vacuum pressure impregnation	Dolby Intellectual Property Licensing, LLC	Active

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272442-EP-3	EP	7/20/2015	EP15177470A	EP2978111	11/18/2020	System and method for preventing stator permanent magnet demagnetization during vacuum pressure impregnation	Dolby Intellectual Property Licensing, LLC	Active
272442-FR-6	FR	7/20/2015	EP15177470A	EP2978111	11/18/2020	System and method for preventing stator permanent magnet demagnetization during vacuum pressure impregnation	Dolby Intellectual Property Licensing, LLC	Active
272442-JP-4	JP	7/14/2015	JP2015140116A	JP6635697	1/29/2020	Systems and methods for preventing stator demagnetization during vacuum impregnation	Dolby Intellectual Property Licensing, LLC	Active
272442-KR-5	KR	7/22/2015	KR20150103826A	KR102411266	6/21/2022	System and method for preventing stator permanent magnet demagnetization during vacuum pressure impregnation	Dolby Intellectual Property Licensing, LLC	Active
272442-US-1	US	7/22/2014	US14/337469	US9673667	6/6/2017	System and method for preventing stator permanent magnet demagnetization during vacuum pressure impregnation	Dolby Intellectual Property Licensing, LLC	Active
272805-US-2	US	6/9/2014	US14/299116	US9246429	1/26/2016	Control method for reducing torque ripple in switched reluctance motors	Dolby Intellectual Property Licensing, LLC	Active
273156-US-1	US	12/1/2015	US14/956067	US10859563	12/8/2020	Erythrocyte aggregation and leukocyte isolation	Dolby Intellectual Property Licensing, LLC	Active
273156-US-5	US	12/7/2020	US17/113527	US11821891	11/21/2023	Erythrocyte aggregation and leukocyte isolation	Dolby Intellectual Property Licensing, LLC	Active
273252-CN-10	CN	1/30/2015	CN201911098959A	CN111055693	4/11/2023	Vehicle propulsion system with multi-channel dc bus and method for manufacturing the system	Dolby Intellectual Property Licensing, LLC	Active
273252-CN-4	CN	1/30/2015	CN201510050190A	CN104816641	11/26/2019	Vehicle propulsion system with multichannel dc bus and the method for manufacturing the system	Dolby Intellectual Property Licensing, LLC	Active
273252-IN-5	IN	1/2/2015	IN36CH2015A	IN36CH2015	7/1/2016	Vehicle propulsion system with multi-channel dc bus and	Dolby Intellectual Property Licensing, LLC	Active
273252-JP-3	JP	1/21/2015	JP2015009031A	JP6567830	8/28/2019	Vehicle propulsion system having a multi-channel dc bus and method of manufacturing the same	Dolby Intellectual Property Licensing, LLC	Active
273252-JP-9	JP	4/1/2019	JP2019069591A	JP6774519	10/28/2020	Vehicle propulsion system with multi-channel dc bus and method of manufacturing the system	Dolby Intellectual Property Licensing, LLC	Active
273252-KR-7	KR	1/20/2015	KR20150009219A	KR101933538	12/28/2018	Vehicle propulsion system with multi-channel dc bus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
273252-US-1	US	1/30/2014	US14/168224	US9834098	12/5/2017	Vehicle propulsion system with multi-channel dc bus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
273252-US-13	US	8/29/2019	US16/555487	US10549648	2/4/2020	Vehicle propulsion system with multi-channel dc bus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
273252-US-14	US	12/23/2019	US16/725151	US10933754	3/2/2021	Vehicle propulsion system with multi-channel dc bus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
273252-US-15	US	2/1/2021	US17/163646	US11351874	6/7/2022	Vehicle propulsion system with multi-channel dc bus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
273252-US-8	US	10/31/2017	US15/799045	US10442296	10/15/2019	Vehicle propulsion system with multi-channel dc bus and method of manufacturing same	Dolby Intellectual Property Licensing, LLC	Active
273345-CN-2	CN	8/19/2015	CN201510764915A	CN105437992	2/5/2021	Vehicle propulsion system with energy storage system and optimization method for controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
273345-CN-8	CN	8/19/2015	CN202010411753A	CN111746495	3/28/2023	Vehicle propulsion system with energy storage system and optimization method for controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active

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273345-DE-9	DE	8/17/2015	EP15181274A	EP2987674	3/8/2023	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
273345-EP-3	EP	8/17/2015	EP15181274A	EP2987674	3/8/2023	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
273345-JP-4	JP	8/17/2015	JP2015160261A	JP6659270	3/4/2020	Vehicle propulsion system with energy storage system and optimized method of controlling its operation	Dolby Intellectual Property Licensing, LLC	Active
273345-JP-7	JP	10/2/2019	JP2019182546A	JP6972076	11/24/2021	Vehicle propulsion system having energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
273345-KR-5	KR	8/19/2015	KR20150116698A	KR102385058	4/12/2022	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
273345-US-1	US	8/19/2014	US14/462765	US9878632	1/30/2018	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
273632-US-1	US	7/31/2014	US14/447968	US9913406	3/6/2018	System and method for controlling ambient temperature at a power-consuming site	Dolby Intellectual Property Licensing, LLC	Active
274422-US-1	US	8/1/2014	US14/449916	US9436866	9/6/2016	High sensitivity flat panel microbiology detection and enumeration system	Dolby Intellectual Property Licensing, LLC	Active
274610-BR-7	BR	1/12/2016	BR102016000601A	BR102016000601	6/14/2022	Vehicle system and method for power transfer in a vehicle system	Dolby Intellectual Property Licensing, LLC	Active
274610-CA-9	CA	1/7/2016	CA2916815A	CA2916815	5/26/2020	Bi-directional dc-dc power converter for a vehicle system	Dolby Intellectual Property Licensing, LLC	Active
274610-CN-3	CN	1/13/2016	CN201610019786A	CN105790588	2/7/2020	Bidirectional dc-dc power converter for vehicle systems	Dolby Intellectual Property Licensing, LLC	Active
274610-IN-4	IN	1/13/2016	IN201644001185A	IN409927	10/28/2022	Bi-directional dc-dc power converter for a vehicle system	Dolby Intellectual Property Licensing, LLC	Active
274610-JP-2	JP	1/8/2016	JP2016002139A	JP6713774	6/24/2020	Bidirectional dc/dc power converter for vehicle system	Dolby Intellectual Property Licensing, LLC	Active
274610-KR-5	KR	1/13/2016	KR20160004444A	KR101938331	4/11/2019	Bi-directional dc-dc power converter for a vehicle system	Dolby Intellectual Property Licensing, LLC	Active
274610-MX-8	MX	1/12/2016	MX2016000431A	MX352791	12/7/2017	Bi-directional dc-dc power converter for a vehicle system.	Dolby Intellectual Property Licensing, LLC	Active
274610-US-1	US	1/13/2015	US14/595706	US9809119	11/7/2017	Bi-directional dc-dc power converter for a vehicle system	Dolby Intellectual Property Licensing, LLC	Active
274626-US-1	US	11/21/2014	US14/550408	US9748564	8/29/2017	Electrode compositions and related energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
274698-CA-5	CA	2/23/2015	CA2942042A	CA2942042	7/12/2022	System architecture for wireless metrological devices	Dolby Intellectual Property Licensing, LLC	Active
274698-CN-6	CN	2/23/2015	CN201580014431A	CN106462532	11/29/2019	The system architecture of wireless measuring equipment	Dolby Intellectual Property Licensing, LLC	Active
274698-JP-8	JP	2/23/2015	JP2016556321A	JP6599349	10/30/2019	System architecture for wireless weighing devices	Dolby Intellectual Property Licensing, LLC	Active
274698-MX-9	MX	2/23/2015	MX2016012012A	MX2016012012	12/7/2016	System architecture for wireless metrological devices.	Dolby Intellectual Property Licensing, LLC	Active

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274698-TW-4	TW	3/17/2015	TW104108520A	TWI663855	6/21/2019	System architecture for wireless metrological devices	Dolby Intellectual Property Licensing, LLC	Active
274698-US-2	US	12/16/2014	US14/571973	US10193979	1/29/2019	System architecture for wireless metrological devices	Dolby Intellectual Property Licensing, LLC	Active
274886-CN-1	CN	10/27/2014	CN201410581804A	CN105590713	3/8/2019	Permanent magnet and its manufacturing method	Dolby Intellectual Property Licensing, LLC	Active
274984-CA-3	CA	6/23/2015	CA2952661A	CA2952661	1/17/2023	Integrated micro-electromechanical switches and a related method thereof	Dolby Intellectual Property Licensing, LLC	Active
274984-CN-4	CN	6/23/2015	CN201580034300A	CN106415772	8/13/2019	Integrated micro-electro-mechanical switch and its correlation technique	Dolby Intellectual Property Licensing, LLC	Active
274984-DE-8	DE	6/23/2015	EP15810992A	EP3161847	5/31/2023	Integrated micro-electromechanical switches and a related method thereof	Dolby Intellectual Property Licensing, LLC	Active
274984-EP-5	EP	6/23/2015	EP15810992A	EP3161847	5/31/2023	Integrated micro-electromechanical switches and a related method thereof	Dolby Intellectual Property Licensing, LLC	Active
274984-JP-6	JP	6/23/2015	JP2016574280A	JP6781048	11/4/2020	Integrated microelectromechanical switches and related methods	Dolby Intellectual Property Licensing, LLC	Active
274984-SG-7	SG	6/23/2015	SG11201610176YA	SG11201610176Y	1/27/2017	Integrated micro-electromechanical switches and a related method thereof	Dolby Intellectual Property Licensing, LLC	Active
274984-US-1	US	6/25/2014	US14/314344	US9117610	8/25/2015	Integrated micro-electromechanical switches and a related method thereof	Dolby Intellectual Property Licensing, LLC	Active
275094-CN-1	CN	1/14/2015	CN201510019281A	CN105835708	4/23/2019	Vehicle drive system and energy management control method	Dolby Intellectual Property Licensing, LLC	Active
275094-JP-2	JP	1/13/2016	JP2016004001A	JP6920010	8/18/2021	A vehicle drive system and an energy control method	Dolby Intellectual Property Licensing, LLC	Active
275094-KR-5	KR	1/14/2016	KR20160004985A	KR102460194	10/27/2022	Vehicle driving system and energy control methods	Dolby Intellectual Property Licensing, LLC	Active
275094-US-3	US	1/14/2016	US14/995936	US10227019	3/12/2019	Vehicle driving system and energy control methods	Dolby Intellectual Property Licensing, LLC	Active
275150-US-1	US	8/26/2014	US14/469002	US9520798	12/13/2016	Multi-level dc-dc converter with galvanic isolation and adaptive conversion ratio	Dolby Intellectual Property Licensing, LLC	Active
275187-BR-7	BR	9/30/2015	BR102015025127A	BR102015025127	6/14/2016	Wireless charging system and system	Dolby Intellectual Property Licensing, LLC	Active
275187-CA-3	CA	10/1/2015	CA2907232A	CA2907232	4/4/2023	System and method for contactless power transfer	Dolby Intellectual Property Licensing, LLC	Active
275187-CN-4	CN	10/9/2015	CN201510647562A	CN105515217	11/6/2020	System and method for contactless power transfer	Dolby Intellectual Property Licensing, LLC	Active
275187-EP-8	EP	10/7/2015	EP15188811A	EP3007304	4/13/2016	System and method for contactless power transfer	Dolby Intellectual Property Licensing, LLC	Active
275187-IN-1	IN	10/10/2014	IN5098CH2014A	IN412397	12/2/2022	System and method for contactless power transfer	Dolby Intellectual Property Licensing, LLC	Active
275187-JP-5	JP	10/5/2015	JP2015197285A	JP6956461	11/2/2021	The system and method for contactless energy transfer	Dolby Intellectual Property Licensing, LLC	Active
275187-KR-10	KR	3/24/2023	KR20230038621A	KR20230044168	4/3/2023	System and method for contactless power transfer	Dolby Intellectual Property Licensing, LLC	Active
275187-KR-6	KR	9/30/2015	KR20150137990A	KR102449510	9/29/2022	System and method for contactless power transfer	Dolby Intellectual Property Licensing, LLC	Active
275187-KR-9	KR	9/26/2022	KR20220121750A	KR102515488	3/29/2023	System and method for contactless power transfer	Dolby Intellectual Property Licensing, LLC	Active

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275187-US-2	US	10/8/2015	US14/878554	US10978880	4/13/2021	System and method for contactless power transfer	Dolby Intellectual Property Licensing, LLC	Active
275327-DE-6	DE	7/13/2016	EP16829011A	EP3344574	4/12/2023	Refractory seed metal for electroplated mems structures	Dolby Intellectual Property Licensing, LLC	Active
275327-EP-5	EP	7/13/2016	EP16829011A	EP3344574	4/12/2023	Refractory seed metal for electroplated mems structures	Dolby Intellectual Property Licensing, LLC	Active
275327-JP-4	JP	7/13/2016	JP2018511120A	JP6820913	1/27/2021	High melting point seed metal with electroplated mems structure	Dolby Intellectual Property Licensing, LLC	Active
275327-TW-3	TW	8/22/2016	TW105126789A	TWI701212	8/11/2020	Refractory seed metal for electroplated mems structures	Dolby Intellectual Property Licensing, LLC	Active
275327-US-1	US	9/3/2015	US14/844132	US9845235	12/19/2017	Refractory seed metal for electroplated mems structures	Dolby Intellectual Property Licensing, LLC	Active
275483-CN-5	CN	8/19/2015	CN201510511035A	CN105365599	10/23/2020	Vehicle propulsion system with energy storage system and optimization method for controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275483-DE-7	DE	8/17/2015	EP15181296A	EP2987673	3/8/2023	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275483-EP-3	EP	8/17/2015	EP15181296A	EP2987673	3/8/2023	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275483-ES-9	ES	8/17/2015	EP15181296A	EP2987673	3/8/2023	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275483-FR-6	FR	8/17/2015	EP15181296A	EP2987673	3/8/2023	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275483-GB-10	GB	8/17/2015	EP15181296A	EP2987673	3/8/2023	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275483-IT-8	IT	8/17/2015	EP15181296A	EP2987673	3/8/2023	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275483-JP-2	JP	8/13/2015	JP2015159747A	JP6700006	5/27/2020	Vehicle propulsion system with energy storage system and optimized method of controlling its operation	Dolby Intellectual Property Licensing, LLC	Active
275483-KR-4	KR	8/19/2015	KR20150116684A	KR101940366	4/11/2019	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275483-US-1	US	8/19/2014	US14/462792	US9399407	7/26/2016	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275546-CN-1	CN	9/24/2014	CN201410493810A	CN105509639	1/1/2019	For the measuring system and measurement method of measure geometry feature	Dolby Intellectual Property Licensing, LLC	Active
275546-DE-7	DE	9/23/2015	EP15186566A	EP3001139	2/6/2019	System and method of measuring geometric characteristics of an object	Dolby Intellectual Property Licensing, LLC	Active
275546-EP-2	EP	9/23/2015	EP15186566A	EP3001139	2/6/2019	System and method of measuring geometric characteristics of an object	Dolby Intellectual Property Licensing, LLC	Active

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275546-FR-6	FR	9/23/2015	EP15186566A	EP3001139	2/6/2019	System and method of measuring geometric characteristics of an object	Dolby Intellectual Property Licensing, LLC	Active
275546-GB-8	GB	9/23/2015	EP15186566A	EP3001139	2/6/2019	System and method of measuring geometric characteristics of an object	Dolby Intellectual Property Licensing, LLC	Active
275546-JP-3	JP	9/17/2015	JP2015183536A	JP6570938	9/4/2019	System and method for measuring geometric features of an object	Dolby Intellectual Property Licensing, LLC	Active
275546-KR-4	KR	9/24/2015	KR20150135539A	KR102004576	7/26/2019	System and method of measuring geometric characteristics of object	Dolby Intellectual Property Licensing, LLC	Active
275546-US-5	US	9/24/2015	US14/863481	US9970753	5/15/2018	System and method of measuring geometric characteristics of object	Dolby Intellectual Property Licensing, LLC	Active
275550-US-1	US	10/30/2014	US14/528013	US9627897	4/18/2017	String current limited battery charging control	Dolby Intellectual Property Licensing, LLC	Active
275550-US-2	US	4/17/2017	US15/488813	US10218188	2/26/2019	String current limited battery charging control	Dolby Intellectual Property Licensing, LLC	Active
275603-US-1	US	9/8/2014	US14/479937	US9783185	10/10/2017	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275603-US-2	US	9/8/2014	US14/480002	US9889752	2/13/2018	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275603-US-3	US	7/13/2016	US15/208777	US10081350	9/25/2018	Vehicle propulsion system having an energy storage system and optimized method of controlling operation thereof	Dolby Intellectual Property Licensing, LLC	Active
275796-US-1	US	10/9/2014	US14/510306	US10391878	8/27/2019	System and method for calibrating battery state of charge	Dolby Intellectual Property Licensing, LLC	Active
276670-US-1	US	1/27/2015	US14/606068	US9897658	2/20/2018	System and method for detecting battery end of discharge	Dolby Intellectual Property Licensing, LLC	Active
276753A-US-1	US	1/30/2015	US14/609549	US10126723	11/13/2018	Performing passive maintenance on an energy storage farm	Dolby Intellectual Property Licensing, LLC	Active
276753-US-1	US	1/30/2015	US14/609528	US9979195	5/22/2018	Power distribution in energy storage farms	Dolby Intellectual Property Licensing, LLC	Active
277187-CN-6	CN	4/5/2016	CN201680084281A	CN109072166	12/21/2018	Activated blood platelet composition with adjustable growth factor levels	Dolby Intellectual Property Licensing, LLC	Active
277187-JP-5	JP	4/5/2016	JP2018550519A	JP6840770	3/10/2021	Activated platelet composition capable of regulating growth factor levels	Dolby Intellectual Property Licensing, LLC	Active
277187-JP-8	JP	2/17/2021	JP2021023806A	JP7248721	3/29/2023	Activated platelet composition with tunable growth factor level	Dolby Intellectual Property Licensing, LLC	Active
277187-KR-7	KR	4/5/2016	KR20187032082A	KR102516995	3/31/2023	Activated platelet composition with tunable growth factor levels	Dolby Intellectual Property Licensing, LLC	Active
277187-US-1	US	3/31/2015	US14/674971	US9752120	9/5/2017	Activated platelet composition with tunable growth factor level	Dolby Intellectual Property Licensing, LLC	Active
277187-US-3	US	9/1/2017	US15/694635	US10927345	2/23/2021	Activated platelet composition with tunable growth factor level	Dolby Intellectual Property Licensing, LLC	Active
277201-JP-3	JP	12/5/2016	JP2016235520A	JP6829594	2/10/2021	Systems and methods for hair segmentation	Dolby Intellectual Property Licensing, LLC	Active
277201-US-1	US	12/16/2015	US14/970580	US9830710	11/28/2017	Systems and methods for hair segmentation	Dolby Intellectual Property Licensing, LLC	Active
277298-CA-4	CA	2/2/2016	CA2977788A	CA2977788	8/29/2023	Electromechanical system substrate attachment for reduced thermal deformation	Dolby Intellectual Property Licensing, LLC	Active

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277298-CN-7	CN	2/2/2016	CN201680013454A	CN107430962	10/18/2019	For reducing the mechatronic systems substrate attachment of thermal deformation	Dolby Intellectual Property Licensing, LLC	Active
277298-DE-11	DE	2/2/2016	EP16710509A	EP3266033	8/24/2022	Electromechanical system substrate attachment for reduced thermal deformation	Dolby Intellectual Property Licensing, LLC	Active
277298-EP-5	EP	2/2/2016	EP16710509A	EP3266033	8/24/2022	Electromechanical system substrate attachment for reduced thermal deformation	Dolby Intellectual Property Licensing, LLC	Active
277298-JP-6	JP	2/2/2016	JP2017544877A	JP6854769	4/7/2021	Electromechanical system board attachment for reducing thermal deformation	Dolby Intellectual Property Licensing, LLC	Active
277298-KR-9	KR	2/2/2016	KR20177026875A	KR102591895	10/19/2023	Attachment to electromechanical system substrate for reduced thermal deformation	Dolby Intellectual Property Licensing, LLC	Active
277298-SG-8	SG	2/2/2016	SG11201706665UA	SG11201706665U	9/28/2017	Electromechanical system substrate attachment for reduced thermal deformation	Dolby Intellectual Property Licensing, LLC	Active
277298-TW-3	TW	2/16/2016	TW105104499A	TWI664136	7/1/2019	Electromechanical system substrate attachment for reduced thermal deformation	Dolby Intellectual Property Licensing, LLC	Active
277298-US-1	US	3/2/2015	US14/634981	US9663347	5/30/2017	Electromechanical system substrate attachment for reduced thermal deformation	Dolby Intellectual Property Licensing, LLC	Active
277870-CN-4	CN	12/11/2015	CN201511036231A	CN105783693	1/21/2020	Method and device for measuring the thickness of an object	Dolby Intellectual Property Licensing, LLC	Active
277870-DE-7	DE	12/4/2015	EP15197958A	EP3032216	11/1/2017	Method and apparatus for measuring thickness of an object	Dolby Intellectual Property Licensing, LLC	Active
277870-GB-8	GB	12/4/2015	EP15197958A	EP3032216	11/1/2017	Method and apparatus for measuring thickness of an object	Dolby Intellectual Property Licensing, LLC	Active
277870-JP-3	JP	12/9/2015	JP2015239807A	JP6664945	3/13/2020	Method and apparatus for measuring the thickness of an object	Dolby Intellectual Property Licensing, LLC	Active
277870-KR-5	KR	12/11/2015	KR20150177162A	KR101878542	7/13/2018	Method and apparatus for measuring thickness of an object	Dolby Intellectual Property Licensing, LLC	Active
277870-TW-6	TW	12/1/2015	TW104140142A	TWI636233	9/21/2018	Method and apparatus for measuring thickness of an object	Dolby Intellectual Property Licensing, LLC	Active
277870-US-1	US	12/12/2014	US14/568912	US9441937	9/13/2016	Method and apparatus for measuring thickness of an object	Dolby Intellectual Property Licensing, LLC	Active
277888A-US-1	US	3/13/2015	US14/657204	US9913628	3/13/2018	System and method for attaching a biopsy collecting device to a spectroscopy system	Joint ownership - Dolby Intellectual Property Licensing, LLC and Memorial Sloan Kettering Cancer Center	Active
277888-US-1	US	3/13/2015	US14/657085	US10531862	1/14/2020	System and method for attaching a biopsy collecting device to a spectroscopy system	Joint ownership - Dolby Intellectual Property Licensing, LLC and Memorial Sloan Kettering Cancer Center	Active
278163-US-1	US	5/22/2015	US14/720005	US9899695	2/20/2018	Zinc-based electrolyte compositions, and related electrochemical processes and articles	Dolby Intellectual Property Licensing, LLC	Active
278667-US-1	US	8/20/2015	US14/831357	US9567232	2/14/2017	Method for preparing sodium chloro-aluminate	Dolby Intellectual Property Licensing, LLC	Active
278828-US-1	US	5/20/2015	US14/717286	US10069457	9/4/2018	System for mounting a microinverter to a photovoltaic panel and method of making same	Dolby Intellectual Property Licensing, LLC	Active
278831-US-1	US	5/20/2015	US14/717195	US10164566	12/25/2018	Universal microinverter mounting bracket for a photovoltaic panel and associated method	Dolby Intellectual Property Licensing, LLC	Active
278851-US-1	US	5/27/2015	US14/722251	US9705422	7/11/2017	System and method for soft switching power inversion	Dolby Intellectual Property Licensing, LLC	Active
278961-JP-3	JP	7/8/2016	JP2016135586A	JP6859034	4/14/2021	Circuits and methods for synchronous rectification in resonant transducers	Dolby Intellectual Property Licensing, LLC	Active

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278961-US-1	US	7/23/2015	US14/806793	US9887634	2/6/2018	Circuits and methods for synchronous rectification in resonant converters	Dolby Intellectual Property Licensing, LLC	Active
279301A-DE-6	DE	7/21/2016	EP16754013A	EP3341323	11/17/2021	Radio frequency micro-electromechanical systems having inverted microstrip transmission lines and method of making the same	Dolby Intellectual Property Licensing, LLC	Active
279301A-EP-5	EP	7/21/2016	EP16754013A	EP3341323	11/17/2021	Radio frequency micro-electromechanical systems having inverted microstrip transmission lines and method of making the same	Dolby Intellectual Property Licensing, LLC	Active
279301A-JP-4	JP	7/21/2016	JP2018511119A	JP6868006	5/12/2021	The radio frequency micro-electro-mechanical system which has the reversed microstrip transmission line, and its manufacturing method	Dolby Intellectual Property Licensing, LLC	Active
279301A-TW-3	TW	8/8/2016	TW105125205A	TWI641015	11/11/2018	Radio frequency micro-electromechanical systems having inverted microstrip transmission lines and method of making the same	Dolby Intellectual Property Licensing, LLC	Active
279301A-US-1	US	8/28/2015	US14/839464	US9954263	4/24/2018	Radio frequency micro-electromechanical systems having inverted microstrip transmission lines and method of making the same	Dolby Intellectual Property Licensing, LLC	Active
279321-US-1	US	5/21/2015	US14/718146	US9786956	10/10/2017	Current collector design to reduce granule bed disruption	Dolby Intellectual Property Licensing, LLC	Active
279321-US-2	US	10/5/2017	US15/725310	US10411305	9/10/2019	Current collector design to reduce granule bed disruption	Dolby Intellectual Property Licensing, LLC	Active
279412-CN-3	CN	7/27/2016	CN201680052540A	CN108140764	5/11/2021	Energy storage device with improved thermal performance	Dolby Intellectual Property Licensing, LLC	Active
279412-DE-7	DE	7/27/2016	EP16747982A	EP3347933	5/20/2020	Energy storage device having improved thermal performance	Dolby Intellectual Property Licensing, LLC	Active
279412-EP-5	EP	7/27/2016	EP16747982A	EP3347933	5/20/2020	Energy storage device having improved thermal performance	Dolby Intellectual Property Licensing, LLC	Active
279412-FR-6	FR	7/27/2016	EP16747982A	EP3347933	5/20/2020	Energy storage device having improved thermal performance	Dolby Intellectual Property Licensing, LLC	Active
279412-GB-9	GB	7/27/2016	EP16747982A	EP3347933	5/20/2020	Energy storage device having improved thermal performance	Dolby Intellectual Property Licensing, LLC	Active
279412-IN-4	IN	3/27/2018	IN201847011310A	IN378849	10/15/2021	Energy storage device having improved thermal performance	Dolby Intellectual Property Licensing, LLC	Active
279412-IT-8	IT	7/27/2016	EP16747982A	EP3347933	5/20/2020	Energy storage device having improved thermal performance	Dolby Intellectual Property Licensing, LLC	Active
279412-US-1	US	9/9/2015	US14/848682	US10177354	1/8/2019	Energy storage device having improved thermal performance	Dolby Intellectual Property Licensing, LLC	Active
279748-CN-3	CN	10/3/2016	CN201680058574A	CN108140816	2/8/2022	Anode composition for over-discharge protection	Dolby Intellectual Property Licensing, LLC	Active
279748-IN-4	IN	4/26/2018	IN201847015772A	IN367351	5/28/2021	Positive electrode composition for overdischarge protection	Dolby Intellectual Property Licensing, LLC	Active
279758-CN-3	CN	9/9/2016	CN201680075610A	CN108369880	5/19/2020	Auxiliary circuit for a relay circuit of a micro-electromechanical system	Dolby Intellectual Property Licensing, LLC	Active
279758-JP-4	JP	9/9/2016	JP2018520446A	JP6821676	1/27/2021	Auxiliary circuit of micro electromechanical system relay circuit	Dolby Intellectual Property Licensing, LLC	Active
279758-US-1	US	10/22/2015	US14/919769	US10083811	9/25/2018	Auxiliary circuit for micro-electromechanical system relay circuit	Dolby Intellectual Property Licensing, LLC	Active
279759-CN-3	CN	10/18/2016	CN201680075721A	CN108475594	12/14/2021	Relay circuit of micro-electromechanical system	Dolby Intellectual Property Licensing, LLC	Active

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279759-JP-4	JP	10/18/2016	JP2018520445A	JP6917367	8/11/2021	Micro electric machine system relay circuit	Dolby Intellectual Property Licensing, LLC	Active
279759-US-1	US	10/22/2015	US14/919797	US10068733	9/4/2018	Micro-electromechanical system relay circuit	Dolby Intellectual Property Licensing, LLC	Active
279765-CN-4	CN	10/18/2016	CN201680075710A	CN108369873	10/23/2020	Isolated control circuit and driver for micro-electromechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
279765-DE-6	DE	10/18/2016	EP16788894A	EP3365907	8/10/2022	Isolated control circuit and driver for micro-electromechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
279765-EP-3	EP	10/18/2016	EP16788894A	EP3365907	8/10/2022	Isolated control circuit and driver for micro-electromechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
279765-JP-5	JP	10/18/2016	JP2018520447A	JP6924751	8/25/2021	The control circuit and driver with which it insulated for the micro-electro-mechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
279765-US-1	US	10/22/2015	US14/919833	US9997317	6/12/2018	Isolated control circuit and driver for micro-electromechanical system switch	Dolby Intellectual Property Licensing, LLC	Active
279791-US-1	US	12/16/2015	US14/971413	US9639725	5/2/2017	Tracking associate for factory and warehousing optimization	Dolby Intellectual Property Licensing, LLC	Active
280212-CN-3	CN	7/21/2016	CN201680050332A	CN107925046	6/1/2021	Battery management system and power connector	Dolby Intellectual Property Licensing, LLC	Active
280212-DE-7	DE	7/21/2016	EP16745027A	EP3345233	2/17/2021	Battery management system and power connector	Dolby Intellectual Property Licensing, LLC	Active
280212-EP-4	EP	7/21/2016	EP16745027A	EP3345233	2/17/2021	Battery management system and power connector	Dolby Intellectual Property Licensing, LLC	Active
280212-FR-6	FR	7/21/2016	EP16745027A	EP3345233	2/17/2021	Battery management system and power connector	Dolby Intellectual Property Licensing, LLC	Active
280212-GB-8	GB	7/21/2016	EP16745027A	EP3345233	2/17/2021	Battery management system and power connector	Dolby Intellectual Property Licensing, LLC	Active
280212-IN-5	IN	2/21/2018	IN201847006601A	IN380685	1/14/2022	Battery management system and power connector	Dolby Intellectual Property Licensing, LLC	Active
280212-US-1	US	8/31/2015	US14/840702	US9692245	6/27/2017	Battery management system and power connector	Dolby Intellectual Property Licensing, LLC	Active
280268-US-1	US	8/11/2015	US14/823852	US10001415	6/19/2018	Multifunctional sensor	Dolby Intellectual Property Licensing, LLC	Active
280467-BR-6	BR	3/30/2016	BR102016007005A	BR102016007005	8/16/2022	Multi-source power storage system and method for power control and management	Dolby Intellectual Property Licensing, LLC	Active
280467-CA-9	CA	3/17/2016	CA2924167A	CA2924167	1/9/2024	Multi-source energy storage system and energy management and control method	Dolby Intellectual Property Licensing, LLC	Active
280467-DE-10	DE	3/30/2016	EP16162905A	EP3075595	10/25/2023	A multi-source energy storage system and method for energy management and control	Dolby Intellectual Property Licensing, LLC	Active
280467-EP-4	EP	3/30/2016	EP16162905A	EP3075595	10/25/2023	A multi-source energy storage system and method for energy management and control	Dolby Intellectual Property Licensing, LLC	Active
280467-IN-3	IN	3/15/2016	IN201644008946A	IN446624	8/25/2023	Multi-source energy storage system and energy management	Dolby Intellectual Property Licensing, LLC	Active
280467-JP-5	JP	3/22/2016	JP2016056436A	JP6742771	8/19/2020	Multi-source energy storage system and method for energy management control	Dolby Intellectual Property Licensing, LLC	Active
280467-KR-7	KR	3/29/2016	KR20160037805A	KR102493179	1/27/2023	Multi-source energy storage system and energy management and control method	Dolby Intellectual Property Licensing, LLC	Active
280467-MX-8	MX	3/30/2016	MX2016004109A	MX361187	11/29/2018	Multi-source energy storage system and energy management and control method.	Dolby Intellectual Property Licensing, LLC	Active

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280467-US-2	US	3/31/2016	US15/086744	US10056755	8/21/2018	Multi-source energy storage system and energy management and control method	Dolby Intellectual Property Licensing, LLC	Active
280508-BR-6	BR	3/30/2016	BR102016006966A	BR102016006966	9/13/2022	Energy storage system and method	Dolby Intellectual Property Licensing, LLC	Active
280508-CA-9	CA	3/29/2016	CA2925245A	CA2925245	9/22/2020	Energy storage system with range extender and energy management and control method	Dolby Intellectual Property Licensing, LLC	Active
280508-CN-1	CN	3/31/2015	CN201510148686A	CN106143170	11/17/2020	Energy storage system with range extender and energy management control method	Dolby Intellectual Property Licensing, LLC	Active
280508-DE-10	DE	3/30/2016	EP16162903A	EP3078536	12/7/2022	Energy storage system with range extender and energy management and control method	Dolby Intellectual Property Licensing, LLC	Active
280508-EP-4	EP	3/30/2016	EP16162903A	EP3078536	12/7/2022	Energy storage system with range extender and energy management and control method	Dolby Intellectual Property Licensing, LLC	Active
280508-IN-3	IN	3/24/2016	IN201644010339A	IN425068	3/17/2023	Energy storage system with range extender and energy	Dolby Intellectual Property Licensing, LLC	Active
280508-JP-5	JP	3/24/2016	JP2016059360A	JP6956470	11/2/2021	The energy storage system and energy-management control method which have a range extender	Dolby Intellectual Property Licensing, LLC	Active
280508-KR-7	KR	3/25/2016	KR20160036074A	KR101940373	1/18/2019	Energy storage system with range extender and energy management and control method	Dolby Intellectual Property Licensing, LLC	Active
280508-MX-8	MX	3/30/2016	MX2016004108A	MX354695	3/15/2018	Energy storage system with range extender and energy management and control method.	Dolby Intellectual Property Licensing, LLC	Active
280508-US-2	US	3/31/2016	US15/087400	US9899843	2/20/2018	Energy storage system with range extender and energy management and control method	Dolby Intellectual Property Licensing, LLC	Active
280514-BR-6	BR	3/30/2016	BR102016007002A	BR102016007002	8/16/2022	Power supply system and energy storage system	Dolby Intellectual Property Licensing, LLC	Active
280514-CA-9	CA	3/17/2016	CA2923952A	CA2923952	8/29/2023	Power supply system and energy storage system	Dolby Intellectual Property Licensing, LLC	Active
280514-IN-3	IN	3/15/2016	IN201644008947A	IN445279	8/18/2023	Power supply system and energy storage system	Dolby Intellectual Property Licensing, LLC	Active
280514-JP-5	JP	3/24/2016	JP2016059361A	JP6775978	10/28/2020	Power generation system and energy storage system	Dolby Intellectual Property Licensing, LLC	Active
280514-KR-7	KR	3/28/2016	KR20160036624A	KR102614468	12/14/2023	Power supply system and energy storage system	Dolby Intellectual Property Licensing, LLC	Active
280514-MX-8	MX	3/30/2016	MX2016004110A	MX366720	7/22/2019	Power supply system and energy storage system.	Dolby Intellectual Property Licensing, LLC	Active
280514-US-2	US	3/31/2016	US15/086218	US10483872	11/19/2019	Power supply system and energy storage system	Dolby Intellectual Property Licensing, LLC	Active
280635-CN-1	CN	8/19/2015	CN201510511572A	CN106469807	11/26/2019	Cathode components, energy accumulating device and method	Dolby Intellectual Property Licensing, LLC	Active
280638-CN-3	CN	8/26/2016	CN201610730574A	CN106476635	5/4/2021	Hybrid system having a plurality of energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
280638-IN-5	IN	8/25/2016	IN201644028932A	IN450992	9/15/2023	Hybrid system with multiple energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
280638-JP-4	JP	8/19/2016	JP2016160925A	JP7038469	3/18/2022	The hybrid system which has several energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
280638-KR-6	KR	8/25/2016	KR20160108203A	KR102530203	5/8/2023	Hybrid system with multiple energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
280638-US-1	US	8/28/2015	US14/838485	US10272788	4/30/2019	Hybrid system with multiple energy storage devices	Dolby Intellectual Property Licensing, LLC	Active

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280661-US-1	US	8/27/2015	US14/837082	US10270275	4/23/2019	Systems and methods for controlling energy storage systems having multiple battery types	Dolby Intellectual Property Licensing, LLC	Active
280946-CN-4	CN	9/8/2016	CN201680058952A	CN108140910	7/13/2021	Heat flux assembly for energy storage device	Dolby Intellectual Property Licensing, LLC	Active
280946-DE-5	DE	9/8/2016	EP16775022A	EP3347941	12/23/2020	Heat flux assembly for an energy storage device	Dolby Intellectual Property Licensing, LLC	Active
280946-EP-3	EP	9/8/2016	EP16775022A	EP3347941	12/23/2020	Heat flux assembly for an energy storage device	Dolby Intellectual Property Licensing, LLC	Active
280946-GB-6	GB	9/8/2016	EP16775022A	EP3347941	12/23/2020	Heat flux assembly for an energy storage device	Dolby Intellectual Property Licensing, LLC	Active
280946-US-1	US	9/9/2015	US14/848670	US10333184	6/25/2019	Heat flux assembly for an energy storage device	Dolby Intellectual Property Licensing, LLC	Active
281041-CN-3	CN	3/30/2017	CN201710202904A	CN107262956	1/11/2022	Co-melting brazing composition and related method and device	Dolby Intellectual Property Licensing, LLC	Active
281041-DE-5	DE	3/23/2017	EP17162643A	EP3225352	8/19/2020	Eutectic brazing compositions, and related processes and devices	Dolby Intellectual Property Licensing, LLC	Active
281041-EP-4	EP	3/23/2017	EP17162643A	EP3225352	8/19/2020	Eutectic brazing compositions, and related processes and devices	Dolby Intellectual Property Licensing, LLC	Active
281041-GB-6	GB	3/23/2017	EP17162643A	EP3225352	8/19/2020	Eutectic brazing compositions, and related processes and devices	Dolby Intellectual Property Licensing, LLC	Active
281041-IN-1	IN	3/30/2016	IN201641010951A	IN475913	12/8/2023	Eutectic brazing compositions, and related processes and devices	Dolby Intellectual Property Licensing, LLC	Active
281056-CN-3	CN	3/30/2017	CN201710202944A	CN107262961	9/24/2021	Brazing composition for malleable brazing structure and related method and device	Dolby Intellectual Property Licensing, LLC	Active
281056-DE-6	DE	3/23/2017	EP17162634A	EP3225351	5/6/2020	Brazing compositions for ductile braze structures, and related processes and devices	Dolby Intellectual Property Licensing, LLC	Active
281056-EP-4	EP	3/23/2017	EP17162634A	EP3225351	5/6/2020	Brazing compositions for ductile braze structures, and related processes and devices	Dolby Intellectual Property Licensing, LLC	Active
281056-FR-5	FR	3/23/2017	EP17162634A	EP3225351	5/6/2020	Brazing compositions for ductile braze structures, and related processes and devices	Dolby Intellectual Property Licensing, LLC	Active
281056-GB-7	GB	3/23/2017	EP17162634A	EP3225351	5/6/2020	Brazing compositions for ductile braze structures, and related processes and devices	Dolby Intellectual Property Licensing, LLC	Active
281056-IN-1	IN	3/30/2016	IN201641010952A	IN514780	3/1/2024	Brazing compositions for ductile braze structures, and	Dolby Intellectual Property Licensing, LLC	Active
281056-US-2	US	3/30/2017	US15/474273	US10549372	2/4/2020	Brazing compositions for ductile braze structures, and related processes and devices	Dolby Intellectual Property Licensing, LLC	Active
281127-CN-5	CN	7/20/2016	CN201680048688A	CN107923953	1/5/2021	System and method for sampling current measurements in an energy storage device	Dolby Intellectual Property Licensing, LLC	Active
281127-DE-7	DE	7/20/2016	EP16747937A	EP3338101	5/4/2022	Systems and methods to sample current measurements in energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
281127-EP-3	EP	7/20/2016	EP16747937A	EP3338101	5/4/2022	Systems and methods to sample current measurements in energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
281127-FR-6	FR	7/20/2016	EP16747937A	EP3338101	5/4/2022	Systems and methods to sample current measurements in energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
281127-GB-9	GB	7/20/2016	EP16747937A	EP3338101	5/4/2022	Systems and methods to sample current measurements in energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
281127-IN-4	IN	2/21/2018	IN201847006600A	IN476984	12/8/2023	Systems and methods to sample current measurements in	Dolby Intellectual Property Licensing, LLC	Active

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281127-IT-8	IT	7/20/2016	EP16747937A	EP3338101	5/4/2022	Systems and methods to sample current measurements in energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
281127-US-1	US	8/19/2015	US14/829798	US10156626	12/18/2018	Systems and methods to sample current measurements in energy storage devices	Dolby Intellectual Property Licensing, LLC	Active
281133-AU-11	AU	12/29/2016	AU2016380342A	AU2016380342	4/13/2023	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-BR-5	BR	12/29/2016	BR112018013444A	BR112018013444	2/12/2019	Methods for generating an activated product and for controlling clot mechanical strength in a platelet gel	Dolby Intellectual Property Licensing, LLC	Active
281133-CN-20	CN	12/29/2016	CN202211454001A	CN115873793	3/31/2023	Calcium control activation of platelets through electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-CN-9	CN	12/29/2016	CN201680082886A	CN108697763	12/9/2022	Calcium control activation of platelets through electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-DE-16	DE	12/29/2016	EP16829375A	EP3397268	7/8/2020	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-DE-22	DE	12/29/2016	EP20184433A	EP3738604	9/13/2023	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-EP-13	EP	12/29/2016	EP20184433A	EP3738604	9/13/2023	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-EP-3	EP	12/29/2016	EP16829375A	EP3397268	7/8/2020	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-FR-15	FR	12/29/2016	EP16829375A	EP3397268	7/8/2020	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-FR-21	FR	12/29/2016	EP20184433A	EP3738604	9/13/2023	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-GB-18	GB	12/29/2016	EP16829375A	EP3397268	7/8/2020	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-GB-24	GB	12/29/2016	EP20184433A	EP3738604	9/13/2023	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-IN-10	IN	6/26/2018	IN201847023787A	IN466802	11/10/2023	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-IT-17	IT	12/29/2016	EP16829375A	EP3397268	7/8/2020	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-IT-23	IT	12/29/2016	EP20184433A	EP3738604	9/13/2023	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-JP-8	JP	12/29/2016	JP2018533697A	JP7050680	4/8/2022	The calcium control activation of the blood platelets by electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-MX-6	MX	12/29/2016	MX2018008146A	MX2018008146	12/6/2018	Activation of platelets controlled by calcium through electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-RU-7	RU	12/29/2016	RU2018121952A	RU2742937	2/11/2021	Calcium-regulated thrombocyte activation by electric stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-US-1	US	12/30/2015	US14/984988	US10633645	4/28/2020	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-US-14	US	4/16/2020	US16/850727	US11591590	2/28/2023	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281750-AU-2	AU	8/17/2016	AU2016216599A	AU2016216599	8/6/2020	Multi-axis magneto-resistance sensor package	Dolby Intellectual Property Licensing, LLC	Active
281750-CA-3	CA	8/18/2016	CA2939710A	CA2939710	10/10/2023	Multi-axis magneto-resistance sensor package	Dolby Intellectual Property Licensing, LLC	Active

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281750-CN-4	CN	8/31/2016	CN201610773374A	CN106482755	3/9/2021	Multi-axis magnetoresistive sensor package	Dolby Intellectual Property Licensing, LLC	Active
281750-DE-10	DE	8/17/2016	EP16184430A	EP3139189	10/14/2020	Multi-axis magneto-resistance sensor package	Dolby Intellectual Property Licensing, LLC	Active
281750-EP-5	EP	8/17/2016	EP16184430A	EP3139189	10/14/2020	Multi-axis magneto-resistance sensor package	Dolby Intellectual Property Licensing, LLC	Active
281750-FR-9	FR	8/17/2016	EP16184430A	EP3139189	10/14/2020	Multi-axis magneto-resistance sensor package	Dolby Intellectual Property Licensing, LLC	Active
281750-GB-11	GB	8/17/2016	EP16184430A	EP3139189	10/14/2020	Multi-axis magneto-resistance sensor package	Dolby Intellectual Property Licensing, LLC	Active
281750-IN-6	IN	8/26/2016	IN201644029028A	IN475114	12/1/2023	Multi-axis magneto-resistance sensor package	Dolby Intellectual Property Licensing, LLC	Active
281750-JP-7	JP	8/23/2016	JP2016162312A	JP7445372	3/7/2024	Multi-axis magneto-resistance sensor package	Dolby Intellectual Property Licensing, LLC	Active
281750-KR-8	KR	8/25/2016	KR20160108218A	KR102556711	7/17/2023	Multi-axis magneto-resistance sensor package	Dolby Intellectual Property Licensing, LLC	Active
281750-US-1	US	9/1/2015	US14/842578	US9995600	6/12/2018	Multi-axis magneto-resistance sensor package	Dolby Intellectual Property Licensing, LLC	Active
282268-US-1	US	11/30/2015	US14/954108	US9879996	1/30/2018	System and method of electrostatic carouseling for gyrocompassing	Dolby Intellectual Property Licensing, LLC	Active
282674-US-2	US	12/10/2015	US14/964829	US10192050	1/29/2019	Methods, systems, apparatus, and storage media for use in detecting anomalous behavior and/or in preventing data loss	Dolby Intellectual Property Licensing, LLC	Active
283013-US-1	US	12/29/2015	US14/982735	US10511163	12/17/2019	Low capacitance surge suppression device	Dolby Intellectual Property Licensing, LLC	Active
283249-DE-12	DE	4/24/2017	EP20167095A	EP3723242	12/29/2021	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active
283249-DE-8	DE	4/24/2017	EP17167677A	EP3240144	4/15/2020	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active
283249-EP-10	EP	4/24/2017	EP20167095A	EP3723242	12/29/2021	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active
283249-EP-4	EP	4/24/2017	EP17167677A	EP3240144	4/15/2020	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active
283249-FR-11	FR	4/24/2017	EP20167095A	EP3723242	12/29/2021	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active
283249-GB-13	GB	4/24/2017	EP20167095A	EP3723242	12/29/2021	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active
283249-GB-9	GB	4/24/2017	EP17167677A	EP3240144	4/15/2020	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active
283249-IN-7	IN	4/22/2017	IN201744014355A	IN462831	11/3/2023	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active
283249-JP-14	JP	1/28/2022	JP2022011367A	JP7337973	9/4/2023	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active
283249-JP-3	JP	4/20/2017	JP2017083282A	JP7330661	8/22/2023	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active
283249-KR-6	KR	4/25/2017	KR20170052909A	KR102393551	5/4/2022	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active
283249-US-2	US	12/2/2016	US15/367261	US10439456	10/8/2019	Sleeve rotor synchronous reluctance electric machine	Dolby Intellectual Property Licensing, LLC	Active

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283282-CH-11	CH	11/10/2016	EP16798910A	EP3375064	12/29/2021	Voltage grouping of energy storage units	Dolby Intellectual Property Licensing, LLC	Active
283282-CN-3	CN	11/10/2016	CN201680078960A	CN108575100	4/12/2022	Voltage grouping of energy storage unit	Dolby Intellectual Property Licensing, LLC	Active
283282-DE-8	DE	11/10/2016	EP16798910A	EP3375064	12/29/2021	Voltage grouping of energy storage units	Dolby Intellectual Property Licensing, LLC	Active
283282-EP-4	EP	11/10/2016	EP16798910A	EP3375064	12/29/2021	Voltage grouping of energy storage units	Dolby Intellectual Property Licensing, LLC	Active
283282-FR-7	FR	11/10/2016	EP16798910A	EP3375064	12/29/2021	Voltage grouping of energy storage units	Dolby Intellectual Property Licensing, LLC	Active
283282-GB-12	GB	11/10/2016	EP16798910A	EP3375064	12/29/2021	Voltage grouping of energy storage units	Dolby Intellectual Property Licensing, LLC	Active
283282-IN-5	IN	5/10/2018	IN201847017577A	IN477803	12/8/2023	Voltage grouping of energy storage units	Dolby Intellectual Property Licensing, LLC	Active
283282-IT-9	IT	11/10/2016	EP16798910A	EP3375064	12/29/2021	Voltage grouping of energy storage units	Dolby Intellectual Property Licensing, LLC	Active
283282-SE-10	SE	11/10/2016	EP16798910A	EP3375064	12/29/2021	Voltage grouping of energy storage units	Dolby Intellectual Property Licensing, LLC	Active
283282-US-1	US	11/13/2015	US14/940445	US9837843	12/5/2017	Voltage grouping of energy storage units	Dolby Intellectual Property Licensing, LLC	Active
283282-ZA-6	ZA	5/18/2018	ZA201803330A	ZA201803330	2/27/2019	Voltage grouping of energy storage units	Dolby Intellectual Property Licensing, LLC	Active
283283-US-1	US	11/13/2015	US14/940473	US10020544	7/10/2018	Adjustable tap location for energy storage cells	Dolby Intellectual Property Licensing, LLC	Active
283492-CN-1	CN	12/18/2015	CN201510960140A	CN106899046	3/27/2020	Energy conversion system	Dolby Intellectual Property Licensing, LLC	Active
283495-JP-3	JP	3/30/2017	JP2017066602A	JP6866206	4/28/2021	A charging device, a system, and a method	Dolby Intellectual Property Licensing, LLC	Active
283495-US-2	US	3/30/2017	US15/473754	US10498146	12/3/2019	Charging device, system and method	Dolby Intellectual Property Licensing, LLC	Active
283501-BR-7	BR	2/16/2017	BR102017003133A	BR102017003133	4/18/2023	Stop-stop system for a vehicle and method of manufacturing a start-stop system	Dolby Intellectual Property Licensing, LLC	Active
283501-CN-4	CN	2/17/2017	CN201710088562A	CN107089233	2/15/2022	Starting/stopping system for vehicle and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
283501-DE-9	DE	2/14/2017	EP17156019A	EP3211212	5/15/2019	Start/stop system for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283501-EP-6	EP	2/14/2017	EP17156019A	EP3211212	5/15/2019	Start/stop system for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283501-FR-8	FR	2/14/2017	EP17156019A	EP3211212	5/15/2019	Start/stop system for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283501-GB-10	GB	2/14/2017	EP17156019A	EP3211212	5/15/2019	Start/stop system for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283501-IN-5	IN	2/8/2017	IN201744004629A	IN201744004629	8/18/2017	Start/stop system for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283501-JP-2	JP	2/7/2017	JP2017020009A	JP7019296	2/15/2022	Start-up/stop system for vehicles, and the method of producing it	Dolby Intellectual Property Licensing, LLC	Active
283501-KR-3	KR	2/10/2017	KR20170018482A	KR102324581	11/12/2021	Start/stop system for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active

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283501-US-1	US	2/17/2016	US15/045754	US10550816	2/4/2020	Start/stop system for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283516-CN-2	CN	4/25/2017	CN201710280077A	CN107364350	11/21/2017	Integration charger and its manufacture method for vehicle	Dolby Intellectual Property Licensing, LLC	Active
283516-DE-9	DE	4/24/2017	EP17167717A	EP3238979	12/6/2023	Integrated charger for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283516-EP-3	EP	4/24/2017	EP17167717A	EP3238979	12/6/2023	Integrated charger for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283516-FR-8	FR	4/24/2017	EP17167717A	EP3238979	12/6/2023	Integrated charger for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283516-GB-12	GB	4/24/2017	EP17167717A	EP3238979	12/6/2023	Integrated charger for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283516-IN-4	IN	4/17/2017	IN201744013461A	IN391206	3/11/2022	Integrated charger for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283516-IT-10	IT	4/24/2017	EP17167717A	EP3238979	12/6/2023	Integrated charger for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283516-JP-5	JP	4/11/2017	JP2017077895A	JP6924061	8/25/2021	Traction system	Dolby Intellectual Property Licensing, LLC	Active
283516-KR-6	KR	4/18/2017	KR20170049653A	KR102370937	3/7/2022	Integrated charger for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283516-NL-11	NL	4/24/2017	EP17167717A	EP3238979	12/6/2023	Integrated charger for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283516-US-1	US	4/25/2016	US15/137679	US10507716	12/17/2019	Integrated charger for vehicles and method of making same	Dolby Intellectual Property Licensing, LLC	Active
283550-US-1	US	11/13/2015	US14/941376	US9774440	9/26/2017	Systems and methods for real-time operation of software radio frequency canceller	Dolby Intellectual Property Licensing, LLC	Active
283956-CN-3	CN	4/26/2017	CN201780026262A	CN109247052	10/23/2020	Power converter topology for energy storage systems	Dolby Intellectual Property Licensing, LLC	Active
283956-IN-5	IN	10/15/2018	IN201847039137A	IN201847039137	11/2/2018	Power converter topology for use in an energy storage system	Dolby Intellectual Property Licensing, LLC	Active
283956-US-1	US	4/26/2016	US15/138335	US9859808	1/2/2018	Power converter topology for use in an energy storage system	Dolby Intellectual Property Licensing, LLC	Active
284013-CN-1	CN	3/25/2016	CN201610176811A	CN107231087	7/2/2021	A range extender and a circuit protection method	Dolby Intellectual Property Licensing, LLC	Active
284013-JP-3	JP	3/24/2017	JP2017058490A	JP6971602	11/24/2021	Range extender and circuit protection method	Dolby Intellectual Property Licensing, LLC	Active
284013-US-2	US	3/24/2017	US15/468147	US10511162	12/17/2019	Range extender and circuit protection method	Dolby Intellectual Property Licensing, LLC	Active
284015-CN-1	CN	11/20/2015	CN201510809124A	CN106740155	7/16/2019	Distance increasing unit, energy management system and energy management method	Dolby Intellectual Property Licensing, LLC	Active
284050-AU-8	AU	3/14/2017	AU2017201729A	AU2017201729	12/20/2018	Topical application of nerve labeling dyes for image-guided surgery	Dolby Intellectual Property Licensing, LLC	Active
284050-BR-3	BR	3/13/2017	BR102017004939A	BR102017004939	10/3/2017	agente farmacÃŠutico de administraÇÃƒo tÃ“pica, mÃ©todo de imageamento de proteÃna bÃsica e kit para fornecer um agente farmacÃŠutico	Dolby Intellectual Property Licensing, LLC	Active
284050-CA-2	CA	3/2/2017	CA2959662A	CA2959662	2/18/2020	Topical application of nerve labeling dyes for image-guided surgery	Dolby Intellectual Property Licensing, LLC	Active
284050-CN-16	CN	3/14/2017	CN202110159761A	CN113018460	8/8/2023	Topical administration of neuromarker dyes for image guided surgery	Dolby Intellectual Property Licensing, LLC	Active

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284050-CN-5	CN	3/14/2017	CN201710149856A	CN107188868	6/18/2021	Partial administration of neuromarker dyes for image-guided surgery	Dolby Intellectual Property Licensing, LLC	Active
284050-DE-13	DE	3/6/2017	EP17159417A	EP3225258	2/27/2019	Topical application of nerve labeling dyes for image-guided surgery	Dolby Intellectual Property Licensing, LLC	Active
284050-EP-10	EP	3/6/2017	EP17159417A	EP3225258	2/27/2019	Topical application of nerve labeling dyes for image-guided surgery	Dolby Intellectual Property Licensing, LLC	Active
284050-FR-12	FR	3/6/2017	EP17159417A	EP3225258	2/27/2019	Topical application of nerve labeling dyes for image-guided surgery	Dolby Intellectual Property Licensing, LLC	Active
284050-GB-14	GB	3/6/2017	EP17159417A	EP3225258	2/27/2019	Topical application of nerve labeling dyes for image-guided surgery	Dolby Intellectual Property Licensing, LLC	Active
284050-JP-7	JP	3/1/2017	JP2017037857A	JP7099803	7/12/2022	The local application of the nerve label pigment for an image induction surgery	Dolby Intellectual Property Licensing, LLC	Active
284050-KR-9	KR	3/14/2017	KR20170031920A	KR101953011	2/27/2019	Topical application of nerve labeling dyes for image-guided surgery	Dolby Intellectual Property Licensing, LLC	Active
284050-MX-4	MX	3/13/2017	MX2017003295A	MX2017003295	8/15/2018	Topical application of nerve labeling dyes for image-guided surgery.	Dolby Intellectual Property Licensing, LLC	Active
284050-RU-11	RU	3/13/2017	RU2017108177A	RU2699571	9/6/2019	Locally administered pharmaceutical agent, method for imaging by administration thereof and kit comprising thereof	Dolby Intellectual Property Licensing, LLC	Active
284050-US-1	US	3/14/2016	US15/069198	US10744212	8/18/2020	Topical application of nerve labeling dyes for image-guided surgery	Dolby Intellectual Property Licensing, LLC	Active
284050-US-15	US	8/14/2020	US16/994127	US11730830	8/22/2023	Topical application of nerve labeling dyes for image-guided surgery	Dolby Intellectual Property Licensing, LLC	Active
284050-US-17	US	7/11/2023	US18/350268	US20230364269	11/16/2023	Topical application of nerve labeling dyes for image-guided surgery	Dolby Intellectual Property Licensing, LLC	Active
284148-BR-6	BR	10/4/2016	BR102016023076A	BR1020160230076	11/1/2022	Lamination of stator, assembly and electric machine	Dolby Intellectual Property Licensing, LLC	Active
284148-CN-3	CN	9/30/2016	CN201610866282A	CN106849403	7/14/2020	Motor stator lamination with two-phase magnetic material	Dolby Intellectual Property Licensing, LLC	Active
284148-DE-9	DE	10/4/2016	EP16192202A	EP3154154	2/27/2019	Electric machine stator lamination with dual phase magnetic material	Dolby Intellectual Property Licensing, LLC	Active
284148-EP-5	EP	10/4/2016	EP16192202A	EP3154154	2/27/2019	Electric machine stator lamination with dual phase magnetic material	Dolby Intellectual Property Licensing, LLC	Active
284148-FR-8	FR	10/4/2016	EP16192202A	EP3154154	2/27/2019	Electric machine stator lamination with dual phase magnetic material	Dolby Intellectual Property Licensing, LLC	Active
284148-GB-10	GB	10/4/2016	EP16192202A	EP3154154	2/27/2019	Electric machine stator lamination with dual phase magnetic material	Dolby Intellectual Property Licensing, LLC	Active
284148-IN-7	IN	10/3/2016	IN201644035756A	IN438199	7/14/2023	Electric machine stator lamination with dual phase	Dolby Intellectual Property Licensing, LLC	Active
284148-JP-2	JP	9/27/2016	JP2016187673A	JP7102092	7/19/2022	Generator stator lamination provided with the two-phase magnetic material	Dolby Intellectual Property Licensing, LLC	Active
284148-KR-4	KR	10/4/2016	KR20160127593A	KR102579577	9/15/2023	Electric machine stator lamination with dual phase magnetic material	Dolby Intellectual Property Licensing, LLC	Active
284148-US-1	US	10/5/2015	US14/874583	US10396615	8/27/2019	Electric machine stator lamination with dual phase magnetic material	Dolby Intellectual Property Licensing, LLC	Active
284633-US-1	US	10/23/2015	US14/921449	US11152648	10/19/2021	Electrode compositions and articles, and related processes	Dolby Intellectual Property Licensing, LLC	Active
284800-US-1	US	2/1/2016	US15/011755	US9722493	8/1/2017	Power converter for ground-referenced system and floating system	Dolby Intellectual Property Licensing, LLC	Active

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285532-CN-2	CN	12/12/2017	CN201711317198A	CN108232339	12/9/2022	Processing method for electrochemical cell	Dolby Intellectual Property Licensing, LLC	Active
285532-DE-6	DE	12/1/2017	EP17204988A	EP3333964	3/3/2021	Treatment processes for electrochemical cells	Dolby Intellectual Property Licensing, LLC	Active
285532-EP-3	EP	12/1/2017	EP17204988A	EP3333964	3/3/2021	Treatment processes for electrochemical cells	Dolby Intellectual Property Licensing, LLC	Active
285532-FR-5	FR	12/1/2017	EP17204988A	EP3333964	3/3/2021	Treatment processes for electrochemical cells	Dolby Intellectual Property Licensing, LLC	Active
285532-GB-7	GB	12/1/2017	EP17204988A	EP3333964	3/3/2021	Treatment processes for electrochemical cells	Dolby Intellectual Property Licensing, LLC	Active
285532-IN-1	IN	12/12/2016	IN201641042297A	IN379732	10/29/2021	Treatment processes for electrochemical cells	Dolby Intellectual Property Licensing, LLC	Active
285532-US-4	US	12/12/2017	US15/838419	US11211642	12/28/2021	Treatment processes for electrochemical cells	Dolby Intellectual Property Licensing, LLC	Active
285698-CN-1	CN	5/4/2016	CN201610290259A	CN107346765	11/26/2019	Bridge arm circuit package assembling and full-bridge circuit package assembling	Dolby Intellectual Property Licensing, LLC	Active
285698-IN-3	IN	5/3/2017	IN201744015669A	IN201744015669	11/10/2017	Bridge leg circuit assembly and full-bridge circuit assembly	Dolby Intellectual Property Licensing, LLC	Active
285698-JP-4	JP	4/21/2017	JP2017084102A	JP7012453	1/28/2022	A bridge leg circuit assembly and a full bridge circuit assembly	Dolby Intellectual Property Licensing, LLC	Active
285698-KR-5	KR	4/25/2017	KR20170052925A	KR102339135	12/16/2021	Bridge leg circuit assembly and full-bridge circuit assembly	Dolby Intellectual Property Licensing, LLC	Active
285698-US-6	US	5/4/2017	US15/586646	US10230365	3/12/2019	Bridge leg circuit assembly and full-bridge circuit assembly	Dolby Intellectual Property Licensing, LLC	Active
285699-DE-7	DE	8/4/2017	EP17184847A	EP3282533	10/18/2023	Solid state circuit breaker and motor driving system	Dolby Intellectual Property Licensing, LLC	Active
285699-EP-6	EP	8/4/2017	EP17184847A	EP3282533	10/18/2023	Solid state circuit breaker and motor driving system	Dolby Intellectual Property Licensing, LLC	Active
285699-IN-5	IN	8/11/2017	IN201744028604A	IN409294	10/21/2022	Solid state circuit breaker and motor driving system	Dolby Intellectual Property Licensing, LLC	Active
285699-JP-3	JP	8/7/2017	JP2017152105A	JP6976100	12/8/2021	A solid-state circuit circuit breaker and a motor drive system	Dolby Intellectual Property Licensing, LLC	Active
285699-KR-4	KR	8/11/2017	KR20170102582A	KR102338061	12/13/2021	Solid state circuit breaker and motor driving system	Dolby Intellectual Property Licensing, LLC	Active
285699-US-2	US	8/4/2017	US15/669384	US10591547	3/17/2020	Solid state circuit breaker and motor driving system	Dolby Intellectual Property Licensing, LLC	Active
285938-CN-3	CN	6/5/2017	CN201710416430A	CN107465345	2/26/2021	System and method for dc/dc converter	Dolby Intellectual Property Licensing, LLC	Active
285938-DE-7	DE	6/2/2017	EP17174155A	EP3255772	12/14/2022	System and method for a dc/dc converter	Dolby Intellectual Property Licensing, LLC	Active
285938-EP-4	EP	6/2/2017	EP17174155A	EP3255772	12/14/2022	System and method for a dc/dc converter	Dolby Intellectual Property Licensing, LLC	Active
285938-IN-6	IN	6/5/2017	IN201744019730A	IN455192	10/6/2023	System and method for a dc/dc converter	Dolby Intellectual Property Licensing, LLC	Active
285938-JP-2	JP	6/2/2017	JP2017110364A	JP7005178	1/21/2022	The system and method of a dc/dc converter	Dolby Intellectual Property Licensing, LLC	Active
285938-KR-5	KR	6/1/2017	KR20170068500A	KR102368860	3/2/2022	System and method for a dc/dc converter	Dolby Intellectual Property Licensing, LLC	Active

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285938-US-1	US	6/6/2016	US15/174042	US9960687	5/1/2018	System and method for a dc/dc converter	Dolby Intellectual Property Licensing, LLC	Active
285974-US-1	US	12/16/2015	US14/970670	US9634585	4/25/2017	Control method for reducing torque ripple in an electrical machine	Dolby Intellectual Property Licensing, LLC	Active
285990-CN-10	CN	2/3/2017	CN202211186116A	CN115588968	1/10/2023	System and method for protecting a wireless power transmission system	Dolby Intellectual Property Licensing, LLC	Active
285990-DE-7	DE	1/30/2017	EP17153732A	EP3203605	1/8/2020	System and method for protecting a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
285990-EP-6	EP	1/30/2017	EP17153732A	EP3203605	1/8/2020	System and method for protecting a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
285990-IN-1	IN	2/3/2016	IN201641006592 8A	IN377243	9/24/2021	System and method for protecting a wireless power	Dolby Intellectual Property Licensing, LLC	Active
285990-JP-11	JP	5/31/2023	JP2023089949A	JP2023110003A	8/8/2023		Dolby Intellectual Property Licensing, LLC	Active
285990-JP-5	JP	1/30/2017	JP2017013768A	JP7005147	1/21/2022	The system and method for protecting a wireless electric power transmission system	Dolby Intellectual Property Licensing, LLC	Active
285990-JP-9	JP	1/5/2022	JP2022000705A	JP7289939	6/12/2023	System and method for protecting wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
285990-SG-3	SG	1/25/2017	SG10201700633QA	SG10201700633Q	9/28/2017	System and method for protecting a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
285990-US-2	US	1/27/2017	US15/417246	US10700550	6/30/2020	System and method for protecting a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
285990-US-8	US	5/21/2020	US16/880712	US11955805	4/9/2024	System and method for protecting a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
287419-US-2	US	7/22/2016	US15/217493	US10132743	11/20/2018	Fixed optics photo-thermal spectroscopy reader and method of use	Dolby Intellectual Property Licensing, LLC	Active
287473-US-1	US	4/15/2016	US15/130401	US10033910	7/24/2018	Synchronous sampling methods for infrared cameras	Dolby Intellectual Property Licensing, LLC	Active
309222-US-2	US	4/27/2011	US13/095387	US8749104	6/10/2014	Rotating electric machine, especially synchronous permanent magnet machine	Dolby Intellectual Property Licensing, LLC	Active
313124-CN-4	CN	6/27/2017	CN201780040548A	CN109643891	2/14/2020	System and method for fault interruption using mems switches	Dolby Intellectual Property Licensing, LLC	Active
313124-DE-7	DE	6/27/2017	EP17737963A	EP3479449	7/29/2020	System and method for fault interruption with mems switches	Dolby Intellectual Property Licensing, LLC	Active
313124-EP-6	EP	6/27/2017	EP17737963A	EP3479449	7/29/2020	System and method for fault interruption with mems switches	Dolby Intellectual Property Licensing, LLC	Active
313124-GB-8	GB	6/27/2017	EP17737963A	EP3479449	7/29/2020	System and method for fault interruption with mems switches	Dolby Intellectual Property Licensing, LLC	Active
313124-JP-5	JP	6/27/2017	JP2018567266A	JP7018904	2/14/2022	The system and method for the failure interruption using a mems switch	Dolby Intellectual Property Licensing, LLC	Active
313124-TW-3	TW	6/26/2017	TW106121294A	TWI742099	10/11/2021	System and method for fault interruption with mems switches	Dolby Intellectual Property Licensing, LLC	Active
313124-US-1	US	6/29/2016	US15/197221	US10211622	2/19/2019	System and method for fault interruption with mems switches	Dolby Intellectual Property Licensing, LLC	Active
313847-US-1	US	1/9/2017	US15/401333	US10983119	4/20/2021	Device for rapid diagnostic tests to detect antigens with improved sensitivity	Joint ownership - Dolby Intellectual Property Licensing, LLC and Tokitae LLC	Active
314005-CN-1	CN	4/20/2017	CN201710260910A	CN108736791	3/29/2022	Vehicle and control method and system thereof	Dolby Intellectual Property Licensing, LLC	Active

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314005-DE-6	DE	4/17/2018	EP18787396A	EP3612847	8/2/2023	Vehicle and control method thereof and system	Dolby Intellectual Property Licensing, LLC	Active
314005-EP-3	EP	4/17/2018	EP18787396A	EP3612847	8/2/2023	Vehicle and control method thereof and system	Dolby Intellectual Property Licensing, LLC	Active
314005-ES-8	ES	4/17/2018	EP18787396A	EP3612847	8/2/2023	Vehicle and control method thereof and system	Dolby Intellectual Property Licensing, LLC	Active
314005-FR-5	FR	4/17/2018	EP18787396A	EP3612847	8/2/2023	Vehicle and control method thereof and system	Dolby Intellectual Property Licensing, LLC	Active
314005-GB-9	GB	4/17/2018	EP18787396A	EP3612847	8/2/2023	Vehicle and control method thereof and system	Dolby Intellectual Property Licensing, LLC	Active
314005-IT-7	IT	4/17/2018	EP18787396A	EP3612847	8/2/2023	Vehicle and control method thereof and system	Dolby Intellectual Property Licensing, LLC	Active
314005-US-4	US	4/17/2018	US16/605842	US11201567	12/14/2021	Vehicle and control method thereof and system	Dolby Intellectual Property Licensing, LLC	Active
314147-CN-4	CN	10/30/2017	CN201711039368A	CN108023412	7/28/2023	System and method for actively controlling output voltage of wireless power transmission system	Dolby Intellectual Property Licensing, LLC	Active
314147-CN-6	CN	10/30/2017	CN202310833729A	CN116961252	10/27/2023	System and method for actively controlling output voltage of wireless power transmission system	Dolby Intellectual Property Licensing, LLC	Active
314147-IN-1	IN	10/28/2016	IN201641037044A	IN368648	6/11/2021	System and method for actively controlling output voltage	Dolby Intellectual Property Licensing, LLC	Active
314147-SG-3	SG	10/9/2017	SG10201708314TA	SG10201708314T	5/30/2018	System and method for actively controlling output voltage of a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
314147-US-2	US	10/26/2017	US15/794524	US10411516	9/10/2019	System and method for actively controlling output voltage of a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
314147-US-5	US	7/31/2019	US16/528306	US11075545	7/27/2021	System and method for actively controlling output voltage of a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
314571-US-1	US	8/23/2017	US15/684695	US10679338	6/9/2020	Three-dimensional modeling of an object	Dolby Intellectual Property Licensing, LLC	Active
314571-US-3	US	4/29/2020	US16/862107	US11145051	10/12/2021	Three-dimensional modeling of an object	Dolby Intellectual Property Licensing, LLC	Active
314858-CN-3	CN	11/20/2017	CN201780076924A	CN110072728	7/7/2020	System and method for leakage current and fault location detection for electric vehicle dc power supply circuits	Dolby Intellectual Property Licensing, LLC	Active
314858-DE-5	DE	11/20/2017	EP17880066A	EP3554885	6/28/2023	System and method for leakage current and fault location detection in electric vehicle dc power circuites	Dolby Intellectual Property Licensing, LLC	Active
314858-EP-4	EP	11/20/2017	EP17880066A	EP3554885	6/28/2023	System and method for leakage current and fault location detection in electric vehicle dc power circuites	Dolby Intellectual Property Licensing, LLC	Active
314858-US-1	US	12/14/2016	US15/379126	US10168372	1/1/2019	System and method for leakage current and fault location detection in electric vehicle dc power circuits	Dolby Intellectual Property Licensing, LLC	Active
314859-CN-3	CN	10/20/2017	CN201780076925A	CN110100184	8/6/2021	Dc leakage current detector and operation method thereof for leakage current detector in dc power supply circuit	Dolby Intellectual Property Licensing, LLC	Active
314859-EP-4	EP	10/20/2017	EP17794516A	EP3555640	7/3/2024	Dc leakage current detector and method of operation thereof for leakage current detector in dc power circuits	Dolby Intellectual Property Licensing, LLC	Active

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314859-US-1	US	12/14/2016	US15/379160	US10203363	2/12/2019	Dc leakage current detector and method of operation thereof for leakage current detection in dc power circuits	Dolby Intellectual Property Licensing, LLC	Active
315022-US-1	US	12/15/2016	US15/381090	US10393492	8/27/2019	Digital wireless feeler gauge	Dolby Intellectual Property Licensing, LLC	Active
315117-IN-1	IN	12/15/2016	IN201641042702A	IN451354	9/15/2023	Charging pads and methods for charging receiver devices	Dolby Intellectual Property Licensing, LLC	Active
315117-US-3	US	10/28/2017	US16/469525	US11081900	8/3/2021	Charging pads and methods for charging receiver devices having different frequency standards	Dolby Intellectual Property Licensing, LLC	Active
315233-US-2	US	10/27/2017	US15/796379	US10740651	8/11/2020	Methods of systems of generating virtual multi-dimensional models using image analysis	Dolby Intellectual Property Licensing, LLC	Active
315343A-US-1	US	1/16/2017	US15/406907	US10390766	8/27/2019	System and method for predicting an excitation pattern of a deep brain stimulation	Dolby Intellectual Property Licensing, LLC	Active
315343-US-1	US	1/16/2017	US15/406895	US10624588	4/21/2020	System and method for predicting an excitation pattern of a deep brain stimulation	Dolby Intellectual Property Licensing, LLC	Active
315659-IN-1	IN	12/15/2016	IN201641042699A	IN461484	10/27/2023	A charging pad and a method for charging one or more	Dolby Intellectual Property Licensing, LLC	Active
315659-US-3	US	10/27/2017	US16/469538	US11223240	1/11/2022	Charging pad and a method for charging one or more receiver devices	Dolby Intellectual Property Licensing, LLC	Active
315659-US-4	US	12/3/2021	US17/541891	US11798737	10/24/2023	Charging pad and a method for charging one or more receiver devices	Dolby Intellectual Property Licensing, LLC	Active
315659-US-5	US	10/23/2023	US18/492358	US20240047133	2/8/2024	Charging pad and a method for charging one or more receiver devices	Dolby Intellectual Property Licensing, LLC	Active
315851-CN-1	CN	1/25/2017	CN201710061052A	CN108347167	7/13/2021	System and method for soft switching dc-dc converter	Dolby Intellectual Property Licensing, LLC	Active
315851-IN-4	IN	1/23/2018	IN201844002681A	IN201844002681	7/27/2018	Systems and methods for a soft switching dc-dc converter	Dolby Intellectual Property Licensing, LLC	Active
315851-JP-3	JP	1/12/2018	JP2018003029A	JP7045859	4/1/2022	The system and method for a soft switching dc-dc converter	Dolby Intellectual Property Licensing, LLC	Active
315851-KR-5	KR	1/23/2018	KR20180008307A	KR102400368	5/23/2022	Systems and methods for a soft switching dc-dc converter	Dolby Intellectual Property Licensing, LLC	Active
315851-US-2	US	12/7/2017	US15/834304	US11784600	10/10/2023	Systems and methods for a soft switching dc-dc converter	Dolby Intellectual Property Licensing, LLC	Active
315892-US-1	US	12/20/2017	US15/848301	US10837962	11/17/2020	Method and associated device for rapid detection of target biomolecules with enhanced sensitivity	Dolby Intellectual Property Licensing, LLC	Active
315892-US-2	US	11/5/2020	US17/090383	US11714084	8/1/2023	Method and associated device for rapid detection of target biomolecules with enhanced sensitivity	Dolby Intellectual Property Licensing, LLC	Active
316115-CN-3	CN	1/3/2018	CN201810004638A	CN108336987	3/9/2021	System and method for gate drive circuit	Dolby Intellectual Property Licensing, LLC	Active
316115-DE-8	DE	12/14/2017	EP17207351A	EP3343768	2/24/2021	Systems and methods for a gate drive circuit	Dolby Intellectual Property Licensing, LLC	Active
316115-EP-2	EP	12/14/2017	EP17207351A	EP3343768	2/24/2021	Systems and methods for a gate drive circuit	Dolby Intellectual Property Licensing, LLC	Active
316115-IN-6	IN	12/28/2017	IN201744047051A	IN201744047051	7/6/2018	Systems and methods for a gate drive circuit	Dolby Intellectual Property Licensing, LLC	Active
316115-JP-5	JP	12/21/2017	JP2017244570A	JP7250421	4/3/2023	System for gate drive circuit and method	Dolby Intellectual Property Licensing, LLC	Active
316115-KR-7	KR	1/2/2018	KR20180000333A	KR102398189	5/17/2022	Systems and methods for a gate drive circuit	Dolby Intellectual Property Licensing, LLC	Active

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316115-US-1	US	1/3/2017	US15/397443	US10374591	8/6/2019	Systems and methods for a gate drive circuit	Dolby Intellectual Property Licensing, LLC	Active
316364-US-1	US	2/1/2017	US15/421915	US10594030	3/17/2020	True time delay module and beam former having plural delay lines selectively connected by plural switching elements including one or more intermediate switching element	Dolby Intellectual Property Licensing, LLC	Active
316496-US-1	US	12/6/2016	US15/370736	US10216983	2/26/2019	Techniques for assessing group level cognitive states	Dolby Intellectual Property Licensing, LLC	Active
316767-CN-3	CN	2/6/2018	CN201880015264A	CN110382286	7/3/2020	Drive system for reducing dc link current ripple and method of operating the same	Dolby Intellectual Property Licensing, LLC	Active
316767-EP-4	EP	2/6/2018	EP18761836A	EP3589514	1/8/2020	Drive system and method of operation thereof for reducing dc link current ripple	Dolby Intellectual Property Licensing, LLC	Active
316767-JP-5	JP	2/6/2018	JP2019547271A	JP7051886	4/11/2022	The drive system and its action method for reducing dc link electric current ripple	Dolby Intellectual Property Licensing, LLC	Active
316767-KR-6	KR	2/6/2018	KR20197028942A	KR102485836	1/5/2023	Drive system and method of operation of drive system to reduce dc link current ripple	Dolby Intellectual Property Licensing, LLC	Active
316767-US-1	US	3/3/2017	US15/449609	US10425032	9/24/2019	Drive system and method of operation thereof for reducing dc link current ripple	Dolby Intellectual Property Licensing, LLC	Active
316767-US-7	US	8/9/2019	US16/536431	US11342876	5/24/2022	Drive system and method of operation thereof for reducing dc link current ripple	Dolby Intellectual Property Licensing, LLC	Active
316772-CN-3	CN	3/16/2018	CN201880031728A	CN110663158	8/2/2022	Double magnetic phase material ring for alternating current motor	Dolby Intellectual Property Licensing, LLC	Active
316772-EP-4	EP	3/16/2018	EP18803259A	EP3625874	3/25/2020	Dual magnetic phase material rings for ac electric machines	Dolby Intellectual Property Licensing, LLC	Active
316772-US-1	US	5/18/2017	US15/598408	US10749385	8/18/2020	Dual magnetic phase material rings for ac electric machines	Dolby Intellectual Property Licensing, LLC	Active
317047-CN-6	CN	10/17/2017	CN201710969353A	CN107959446	11/30/2021	System and method for motor senderless control using magnetic alignment features	Dolby Intellectual Property Licensing, LLC	Active
317047-DE-8	DE	10/12/2017	EP17196147A	EP3309954	1/17/2024	System and method for sensorless control of electric machines using magnetic alignment signatures	Dolby Intellectual Property Licensing, LLC	Active
317047-EP-5	EP	10/12/2017	EP17196147A	EP3309954	1/17/2024	System and method for sensorless control of electric machines using magnetic alignment signatures	Dolby Intellectual Property Licensing, LLC	Active
317047-IN-4	IN	10/10/2017	IN201744035888A	IN469106	11/17/2023	System and method for sensorless control of electric	Dolby Intellectual Property Licensing, LLC	Active
317047-JP-2	JP	10/3/2017	JP2017193158A	JP7271079	5/11/2023	System and method for sensorless control of electric machines using magnetic alignment signatures	Dolby Intellectual Property Licensing, LLC	Active
317047-KR-3	KR	10/16/2017	KR20170134136A	KR101993524	6/26/2019	System and method for sensorless control of electric machines using magnetic alignment signatures	Dolby Intellectual Property Licensing, LLC	Active
317047-US-1	US	10/17/2016	US15/295830	US9948224	4/17/2018	System and method for sensorless control of electric machines using magnetic alignment signatures	Dolby Intellectual Property Licensing, LLC	Active
317047-US-7	US	10/16/2017	US15/784696	US10224851	3/5/2019	System and method for sensorless control of electric machines using magnetic alignment signatures	Dolby Intellectual Property Licensing, LLC	Active
317124-US-1	US	12/6/2016	US15/370746	US10445565	10/15/2019	Crowd analytics via one shot learning	Dolby Intellectual Property Licensing, LLC	Active
317318-US-1	US	9/13/2017	US15/703835	US10423820	9/24/2019	Systems and methods for automatic generation of training sets for machine interpretation of images	Dolby Intellectual Property Licensing, LLC	Active
317707-CN-4	CN	8/9/2018	CN201880058996A	CN111065710	4/14/2023	Green light emitting phosphor and device thereof	Dolby Intellectual Property Licensing, LLC	Active

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317707-EP-5	EP	8/9/2018	EP18857541A	EP3684885	7/29/2020	Green-emitting phosphors and devices thereof	Dolby Intellectual Property Licensing, LLC	Active
317707-JP-6	JP	8/9/2018	JP2020515977A	JP7257391B2	4/13/2023		Dolby Intellectual Property Licensing, LLC	Active
317707-KR-7	KR	8/9/2018	KR20207011204A	KR102671144	5/30/2024	Green phosphors and devices thereof	Dolby Intellectual Property Licensing, LLC	Active
317707-TW-10	TW	9/6/2018	TW110123430A	TWI755340	2/11/2022	Green-emitting phosphors and devices thereof	Dolby Intellectual Property Licensing, LLC	Active
317707-TW-2	TW	9/6/2018	TW107131340A	TWI732133	7/1/2021	Green-emitting phosphors and devices thereof	Dolby Intellectual Property Licensing, LLC	Active
317707-US-1	US	9/20/2017	US15/710780	US10720554	7/21/2020	Green-emitting phosphors and devices thereof	Dolby Intellectual Property Licensing, LLC	Active
317707-US-9	US	5/22/2020	US16/882133	US11094856	8/17/2021	Green-emitting phosphors and devices thereof	Dolby Intellectual Property Licensing, LLC	Active
318182-CN-3	CN	8/22/2018	CN201880054159A	CN110999055	12/1/2020	System and method for fast current sensing and transistor timing control	Dolby Intellectual Property Licensing, LLC	Active
318182-DE-8	DE	8/22/2018	EP18762742A	EP3673573	5/19/2021	System and method for rapid current sensing and transistor timing control	Dolby Intellectual Property Licensing, LLC	Active
318182-EP-4	EP	8/22/2018	EP18762742A	EP3673573	5/19/2021	System and method for rapid current sensing and transistor timing control	Dolby Intellectual Property Licensing, LLC	Active
318182-FR-7	FR	8/22/2018	EP18762742A	EP3673573	5/19/2021	System and method for rapid current sensing and transistor timing control	Dolby Intellectual Property Licensing, LLC	Active
318182-GB-9	GB	8/22/2018	EP18762742A	EP3673573	5/19/2021	System and method for rapid current sensing and transistor timing control	Dolby Intellectual Property Licensing, LLC	Active
318182-JP-5	JP	8/22/2018	JP2020510092A	JP7209447	1/20/2023	Systems and methods for fast current sensing and transistor timing control	Dolby Intellectual Property Licensing, LLC	Active
318182-KR-6	KR	8/22/2018	KR20207007968A	KR102581266	9/21/2023	Systems and methods for fast current sensing and transistor timing control	Dolby Intellectual Property Licensing, LLC	Active
318182-US-1	US	8/22/2017	US15/682940	US10491096	11/26/2019	System and method for rapid current sensing and transistor timing control	Dolby Intellectual Property Licensing, LLC	Active
318542-CN-2	CN	8/31/2017	CN201780094322A	CN111032319	3/15/2022	Encoding volume data to support trusted transaction delivery	Dolby Intellectual Property Licensing, LLC	Active
318542-DE-9	DE	8/31/2017	EP17923384A	EP3676065	4/12/2023	Encoding volumetric data to support trusted transaction delivery	Dolby Intellectual Property Licensing, LLC	Active
318542-EP-3	EP	8/31/2017	EP17923384A	EP3676065	4/12/2023	Encoding volumetric data to support trusted transaction delivery	Dolby Intellectual Property Licensing, LLC	Active
318542-FR-8	FR	8/31/2017	EP17923384A	EP3676065	4/12/2023	Encoding volumetric data to support trusted transaction delivery	Dolby Intellectual Property Licensing, LLC	Active
318542-GB-10	GB	8/31/2017	EP17923384A	EP3676065	4/12/2023	Encoding volumetric data to support trusted transaction delivery	Dolby Intellectual Property Licensing, LLC	Active
318542-JP-4	JP	8/31/2017	JP2020511468A	JP7032518	3/8/2022	The encoding of the volume data for supporting reliable transaction delivery	Dolby Intellectual Property Licensing, LLC	Active
318542-KR-5	KR	8/31/2017	KR20207009008A	KR102386096	4/12/2022	Encoding of volumetric data to support trusted transactional delivery	Dolby Intellectual Property Licensing, LLC	Active
318542-US-6	US	8/31/2017	US16/641155	US11077617	8/3/2021	Encoding volumetric data to support trusted transaction delivery	Dolby Intellectual Property Licensing, LLC	Active
318542-US-7	US	6/30/2021	US17/364012	US11623407	4/11/2023	Encoding volumetric data to support trusted transaction delivery	Dolby Intellectual Property Licensing, LLC	Active

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318543-CN-2	CN	8/31/2017	CN201780094076A	CN111033405	8/22/2023	Intellectual property exchange ecological system for increasing material production	Dolby Intellectual Property Licensing, LLC	Active
318543-EP-3	EP	8/31/2017	EP17923191A	EP3676676	7/8/2020	Intellectual property exchange ecosystem for additive manufacturing	Dolby Intellectual Property Licensing, LLC	Active
318543-JP-4	JP	8/31/2017	JP2020511469A	JP7077399	5/30/2022	The intellectual-property replacement ecosystem for lamination-modeling	Dolby Intellectual Property Licensing, LLC	Active
318543-KR-5	KR	8/31/2017	KR20207009014A	KR102573977	9/1/2023	Ecosystem of intellectual property exchange for further production	Dolby Intellectual Property Licensing, LLC	Active
318543-KR-8	KR	8/31/2017	KR20237029458A	KR20230128593	9/5/2023	Intellectual property exchange ecosystem for additive manufacturing	Dolby Intellectual Property Licensing, LLC	Active
318543-US-6	US	8/31/2017	US16/641161	US11468528	10/11/2022	Intellectual property exchange ecosystem for additive manufacturing	Dolby Intellectual Property Licensing, LLC	Active
318543-US-7	US	10/3/2022	US17/937615	US11948215	4/2/2024	Intellectual property exchange ecosystem for additive manufacturing	Dolby Intellectual Property Licensing, LLC	Active
318580-CN-2	CN	8/31/2017	CN201780094410A	CN111448069	2/25/2022	Distribution of customized engineering model for additive manufacturing	Dolby Intellectual Property Licensing, LLC	Active
318580-EP-3	EP	8/31/2017	EP17923537A	EP3676719	7/8/2020	Distribution of customized engineering models for additive manufacturing	Dolby Intellectual Property Licensing, LLC	Active
318580-JP-4	JP	8/31/2017	JP2020511446A	JP7105871	7/25/2022	Distribution of the engineering model with which it customized for lamination-modeling	Dolby Intellectual Property Licensing, LLC	Active
318580-KR-5	KR	8/31/2017	KR20207009100A	KR102417932	7/5/2022	Dispersion of customized engineering models for further fabrication	Dolby Intellectual Property Licensing, LLC	Active
318580-US-6	US	8/31/2017	US16/641167	US11453170	9/27/2022	Distribution of customized engineering models for additive manufacturing	Dolby Intellectual Property Licensing, LLC	Active
318587-CN-2	CN	8/31/2017	CN201780094368A	CN111095315	5/7/2024	Collaborative transaction information processing for block chain enabled supply chain	Dolby Intellectual Property Licensing, LLC	Active
318587-EP-3	EP	8/31/2017	EP17923052A	EP3676768	7/8/2020	Blockchain enabled collaborative transaction information processing for a supply chain	Dolby Intellectual Property Licensing, LLC	Active
318587-JP-4	JP	8/31/2017	JP2020511997A	JP7257386B2	4/13/2023		Dolby Intellectual Property Licensing, LLC	Active
318587-KR-7	KR	8/31/2017	KR20237015666A	KR20230069258	5/18/2023	Blockchain enabled collaborative transaction information processing for a supply chain	Dolby Intellectual Property Licensing, LLC	Active
318587-US-6	US	8/31/2017	US16/641188	US11783346	10/10/2023	Blockchain enabled collaborative transaction information processing for a supply chain	Dolby Intellectual Property Licensing, LLC	Active
318638-US-1	US	12/20/2017	US15/848302	US10830760	11/10/2020	Device for rapid detection of tuberculosis-lipoarabinomannan (tb-lam) with enhanced sensitivity	Joint ownership - Dolby Intellectual Property Licensing, LLC and Tokitae LLC	Active
318638-US-2	US	11/6/2020	US17/091501	US11726078	8/15/2023	Device for rapid detection of tuberculosis-lipoarabinomannan (tb-lam) with enhanced sensitivity	Joint ownership - Dolby Intellectual Property Licensing, LLC and Tokitae LLC	Active
318738A-US-1	US	10/20/2017	US15/789000	US11305663	4/19/2022	Energy efficient hands-free electric vehicle charger for autonomous vehicles in uncontrolled environments	Dolby Intellectual Property Licensing, LLC	Active
318738-US-2	US	10/20/2017	US15/788971	US10675982	6/9/2020	System and method for inductive charging with improved efficiency	Dolby Intellectual Property Licensing, LLC	Active
318763-US-2	US	1/2/2019	US16/238237	US10862402	12/8/2020	System and method for power converter including inverter, resonant circuit. and voltage multiplier	Dolby Intellectual Property Licensing, LLC	Active
319133-US-1	US	8/21/2018	US16/106688	US10820404	10/27/2020	Neutron generator with a rotating target in a vacuum chamber	Dolby Intellectual Property Licensing, LLC	Active

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319318-CN-3	CN	4/19/2018	CN201880034568A	CN110663157	2/13/2024	Power transmission device and related method	Dolby Intellectual Property Licensing, LLC	Active
319318-IN-1	IN	5/26/2017	IN201741018544A	IN201741018544	11/30/2018	A power transfer device and an associated method thereof	Dolby Intellectual Property Licensing, LLC	Active
319318-US-4	US	4/19/2018	US16/616395	US10998822	5/4/2021	Power transfer device with a plurality of converters	Dolby Intellectual Property Licensing, LLC	Active
319319-CN-3	CN	5/21/2018	CN201880035230A	CN110679060	5/24/2024	Transmission assembly for universal wireless charging device and method thereof	Dolby Intellectual Property Licensing, LLC	Active
319319-IN-1	IN	5/30/2017	IN201741019042A	IN407617	9/30/2022	Transmitting assembly for a universal wireless charging	Dolby Intellectual Property Licensing, LLC	Active
319319-US-4	US	5/21/2018	US16/616409	US11689056	6/27/2023	Transmitting assembly for a universal wireless charging device and a method thereof	Dolby Intellectual Property Licensing, LLC	Active
319319-US-5	US	6/16/2023	US18/336335	US20230327491	10/12/2023	Transmitting assembly for a universal wireless charging device and a method thereof	Dolby Intellectual Property Licensing, LLC	Active
319335-CN-4	CN	6/11/2018	CN201880044663A	CN110831706	2/21/2020	Article for high temperature operations and related methods	Dolby Intellectual Property Licensing, LLC	Active
319335-EP-5	EP	6/11/2018	EP18828354A	EP3648902	5/13/2020	Articles for high temperature service and related method	Dolby Intellectual Property Licensing, LLC	Active
319335-JP-6	JP	6/11/2018	JP2020500180A	JP7158120	10/21/2022	High temperature articles and related methods	Dolby Intellectual Property Licensing, LLC	Active
319335-KR-7	KR	6/11/2018	KR20207003486A	KR102485843	1/5/2023	Methods related to articles for high temperature service	Dolby Intellectual Property Licensing, LLC	Active
319335-US-2	US	2/7/2018	US15/891241	US11155721	10/26/2021	Articles for high temperature service and related method	Dolby Intellectual Property Licensing, LLC	Active
319335-US-8	US	9/21/2021	US17/480889	US11851581	12/26/2023	Articles for high temperature service and related method	Dolby Intellectual Property Licensing, LLC	Active
319620-CN-3	CN	8/21/2018	CN201880066411A	CN111201668	3/26/2021	True delay beamformer module and method of manufacturing the same	Dolby Intellectual Property Licensing, LLC	Active
319620-DE-7	DE	8/21/2018	EP18867077A	EP3695460	10/4/2023	True time delay beam former module and method of making the same	Dolby Intellectual Property Licensing, LLC	Active
319620-EP-4	EP	8/21/2018	EP18867077A	EP3695460	10/4/2023	True time delay beam former module and method of making the same	Dolby Intellectual Property Licensing, LLC	Active
319620-JP-5	JP	8/21/2018	JP2020520471A	JP7217746	2/3/2023	Real-time delay beamformer module and its fabrication method	Dolby Intellectual Property Licensing, LLC	Active
319620-KR-6	KR	8/21/2018	KR20207013539A	KR20200057090	5/25/2020	Real-time delay beam former module and manufacturing method	Dolby Intellectual Property Licensing, LLC	Abandoned
319620-US-1	US	10/13/2017	US15/782991	US10784576	9/22/2020	True time delay beam former module and method of making the same	Dolby Intellectual Property Licensing, LLC	Active
319621-CN-3	CN	7/5/2018	CN201880065985A	CN111201724	5/7/2021	True delay beam former and operation method	Dolby Intellectual Property Licensing, LLC	Active
319621-DE-8	DE	7/5/2018	EP18868697A	EP3695528	8/30/2023	True time delay beam former and method of operation	Dolby Intellectual Property Licensing, LLC	Active
319621-EP-4	EP	7/5/2018	EP18868697A	EP3695528	8/30/2023	True time delay beam former and method of operation	Dolby Intellectual Property Licensing, LLC	Active
319621-FR-7	FR	7/5/2018	EP18868697A	EP3695528	8/30/2023	True time delay beam former and method of operation	Dolby Intellectual Property Licensing, LLC	Active
319621-GB-9	GB	7/5/2018	EP18868697A	EP3695528	8/30/2023	True time delay beam former and method of operation	Dolby Intellectual Property Licensing, LLC	Active

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319621-JP-5	JP	7/5/2018	JP2020520641A	JP7212684	1/25/2023	Real time delay beam former and how it works	Dolby Intellectual Property Licensing, LLC	Active
319621-KR-6	KR	7/5/2018	KR20207013598A	KR102514959	3/27/2023	Real-time delayed beamformer and its operating method	Dolby Intellectual Property Licensing, LLC	Active
319621-US-1	US	10/13/2017	US15/782969	US10211902	2/19/2019	True time delay beam former and method of operation	Dolby Intellectual Property Licensing, LLC	Active
319639-CN-3	CN	8/27/2018	CN201880066919A	CN111226347	5/7/2021	High impedance rf mems transmission device and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
319639-EP-4	EP	8/27/2018	EP18869267A	EP3698429	8/26/2020	High impedance rf mems transmission devices and method of making the same	Dolby Intellectual Property Licensing, LLC	Active
319639-JP-5	JP	8/27/2018	JP2020521589A	JP7217748	2/3/2023	High impedance rf mems transmission element and its manufacturing method	Dolby Intellectual Property Licensing, LLC	Active
319639-KR-6	KR	8/27/2018	KR20207013786A	KR102562909	8/2/2023	High-impedance rgb transmission devices and method for manufacturing the same	Dolby Intellectual Property Licensing, LLC	Active
319639-US-1	US	10/18/2017	US15/786696	US10326200	6/18/2019	High impedance rf mems transmission devices and method of making the same	Dolby Intellectual Property Licensing, LLC	Active
319927-CN-3	CN	9/14/2018	CN201880068518A	CN111247736	11/21/2023	System and method for preventing demagnetization of permanent magnet in motor	Dolby Intellectual Property Licensing, LLC	Active
319927-EP-4	EP	9/14/2018	EP18870760A	EP3701628	9/2/2020	System and method for preventing permanent magnet demagnetization in electrical machines	Dolby Intellectual Property Licensing, LLC	Active
319927-JP-5	JP	9/14/2018	JP2020542529A	JP7235756	3/8/2023	Systems and methods to prevent demagnetization of permanent magnets in electromechanical machines	Dolby Intellectual Property Licensing, LLC	Active
319927-KR-7	KR	9/14/2018	KR20247002150A	KR20240012617	1/29/2024	System and method for preventing permanent magnet demagnetization in electrical machines	Dolby Intellectual Property Licensing, LLC	Active
319927-US-1	US	10/23/2017	US15/790251	US10230321	3/12/2019	System and method for preventing permanent magnet demagnetization in electrical machines	Dolby Intellectual Property Licensing, LLC	Active
320002-CN-3	CN	11/13/2018	CN201880073502A	CN111344690	3/28/2023	Layered data exchange management system	Dolby Intellectual Property Licensing, LLC	Active
320002-DE-10	DE	11/13/2018	EP18880028A	EP3710950	5/31/2023	Hierarchical data exchange management system	Dolby Intellectual Property Licensing, LLC	Active
320002-EP-4	EP	11/13/2018	EP18880028A	EP3710950	5/31/2023	Hierarchical data exchange management system	Dolby Intellectual Property Licensing, LLC	Active
320002-FR-9	FR	11/13/2018	EP18880028A	EP3710950	5/31/2023	Hierarchical data exchange management system	Dolby Intellectual Property Licensing, LLC	Active
320002-GB-11	GB	11/13/2018	EP18880028A	EP3710950	5/31/2023	Hierarchical data exchange management system	Dolby Intellectual Property Licensing, LLC	Active
320002-JP-5	JP	11/13/2018	JP2020526118A	JP7312746	7/21/2023	Hierarchical data exchange management system	Dolby Intellectual Property Licensing, LLC	Active
320002-KR-6	KR	11/13/2018	KR20207016814A	KR102566881	8/11/2023	Hierarchical data exchange management system	Dolby Intellectual Property Licensing, LLC	Active
320002-US-1	US	11/14/2017	US15/812003	US10938950	3/2/2021	Hierarchical data exchange management system	Dolby Intellectual Property Licensing, LLC	Active
320002-US-12	US	5/8/2023	US18/144493	US20230275978	8/31/2023	Hierarchical data exchange management system	Dolby Intellectual Property Licensing, LLC	Active
320002-US-7	US	2/4/2021	US17/167854	US11323544	5/3/2022	Hierarchical data exchange management system	Dolby Intellectual Property Licensing, LLC	Active
320002-US-8	US	4/22/2022	US17/727342	US11683397	6/20/2023	Hierarchical data exchange management system	Dolby Intellectual Property Licensing, LLC	Active

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320128-DE-8	DE	4/23/2018	EP18791526A	EP3615779	3/23/2022	Adaptive linear linked piston electric power generator	Dolby Intellectual Property Licensing, LLC	Active
320128-EP-3	EP	4/23/2018	EP18791526A	EP3615779	3/23/2022	Adaptive linear linked piston electric power generator	Dolby Intellectual Property Licensing, LLC	Active
320128-FR-7	FR	4/23/2018	EP18791526A	EP3615779	3/23/2022	Adaptive linear linked piston electric power generator	Dolby Intellectual Property Licensing, LLC	Active
320128-GB-9	GB	4/23/2018	EP18791526A	EP3615779	3/23/2022	Adaptive linear linked piston electric power generator	Dolby Intellectual Property Licensing, LLC	Active
320128-US-11	US	1/5/2022	US17/568901	US11846230	12/19/2023	Adaptive linear linked piston electric power generator	Dolby Intellectual Property Licensing, LLC	Active
320128-US-4	US	4/23/2018	US16/607189	US11168609	11/9/2021	Adaptive linear linked piston electric power generator	Dolby Intellectual Property Licensing, LLC	Active
320128-US-5	US	10/28/2021	US17/512852	US11840957	12/12/2023	Adaptive linear linked piston electric power generator	Dolby Intellectual Property Licensing, LLC	Active
320128-US-6	US	10/28/2021	US17/512942	US11815004	11/14/2023	Adaptive linear linked piston electric power generator	Dolby Intellectual Property Licensing, LLC	Active
320529-US-1	US	3/20/2020	US16/824917	US11373069	6/28/2022	Analogy engine for grounding and situational awareness	Dolby Intellectual Property Licensing, LLC	Active
320880-US-1	US	3/6/2018	US15/913434	US10488174	11/26/2019	Systems and methods for wearable voltage detection devices	Dolby Intellectual Property Licensing, LLC	Active
321104-US-1	US	8/27/2018	US16/113644	US10430517	10/1/2019	Apparatus, system and method for providing an agent that intelligently solves information technology issues	Dolby Intellectual Property Licensing, LLC	Active
322985-CN-3	CN	2/25/2019	CN201980016599A	CN111801927	5/14/2024	Industrial data validation using secure distributed ledgers	Dolby Intellectual Property Licensing, LLC	Active
322985-EP-4	EP	2/25/2019	EP19767806A	EP3766228	1/20/2021	Industrial data verification using secure, distributed ledger	Dolby Intellectual Property Licensing, LLC	Active
322985-IN-5	IN	9/18/2020	IN202017040449A	IN202017040449	1/1/2021	Industrial data verification using secure, distributed ledger	Dolby Intellectual Property Licensing, LLC	Active
322985-JP-6	JP	2/25/2019	JP2020547087A	JP7235764	3/8/2023	Industrial data validation using secure distributed ledger	Dolby Intellectual Property Licensing, LLC	Active
322985-US-1	US	3/16/2018	US15/923279	US11582042	2/14/2023	Industrial data verification using secure, distributed ledger	Dolby Intellectual Property Licensing, LLC	Active
323537-EP-3	EP	2/20/2019	EP19709270A	EP3759487	1/6/2021	System and method for electric pulse based activation of biological samples	Dolby Intellectual Property Licensing, LLC	Active
323537-JP-4	JP	2/20/2019	JP2020543970A	JP7382945	11/17/2023	Systems and methods for electrical pulse-based activation of biological samples	Dolby Intellectual Property Licensing, LLC	Active
323537-US-1	US	2/26/2018	US15/905463	US10968423	4/6/2021	System and method for electric pulse based activation of biological samples	Dolby Intellectual Property Licensing, LLC	Active
323953-US-1	US	2/20/2018	US15/899594	US10543361	1/28/2020	System and method for localization of deep brain stimulation electrode via magnetic resonance imaging	Dolby Intellectual Property Licensing, LLC	Active
324448-US-1	US	6/18/2018	US16/010809	US10970669	4/6/2021	Blockchain enabled transaction processing for an industrial asset supply chain	Dolby Intellectual Property Licensing, LLC	Active
324448-US-2	US	3/9/2021	US17/196764	US11829942	11/28/2023	Blockchain enabled transaction processing for an industrial asset supply chain	Dolby Intellectual Property Licensing, LLC	Active
324595-EP-3	EP	1/15/2020	EP20704169A	EP3914339	12/1/2021	System for predicting optimal deep brain stimulation parameters	Dolby Intellectual Property Licensing, LLC	Active
324595-US-1	US	1/22/2019	US16/253406	US10905882	2/2/2021	Systems and methods for predicting optimal deep brain stimulation parameters	Dolby Intellectual Property Licensing, LLC	Active

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324680-EP-3	EP	9/25/2019	EP19865020A	EP3857693	8/4/2021	System and method for a magnetically coupled inductor boost and multiphase buck converter with split duty cycle	Dolby Intellectual Property Licensing, LLC	Active
324680-US-1	US	9/28/2018	US16/145406	US10574144	2/25/2020	System and method for a magnetically coupled inductor boost and multiphase buck converter with split duty cycle	Dolby Intellectual Property Licensing, LLC	Active
324828-US-2	US	11/27/2019	US16/698622	US11177759	11/16/2021	System and method for self-sensing of electric machines and reduction of noise and vibration associated therewith	Dolby Intellectual Property Licensing, LLC	Active
324845-CN-4	CN	3/22/2019	CN201980024991A	CN111937272	11/13/2020	Receiver unit for wireless power transmission system	Dolby Intellectual Property Licensing, LLC	Active
324845-IN-1	IN	4/19/2018	IN201841014948A	IN412011	11/25/2022	A receiver unit of a wireless power transfer system and	Dolby Intellectual Property Licensing, LLC	Active
324845-TW-2	TW	4/15/2019	TW108113031A	TWI812700	8/21/2023	Receiver unit, method and integrated electronic component of a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
324845-TW-8	TW	4/15/2019	TW112128545A	TW202410599	3/1/2024		Dolby Intellectual Property Licensing, LLC	Active
324845-US-5	US	3/22/2019	US17/048429	US11316381	4/26/2022	Receiver unit of a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
324845-US-6	US	4/21/2022	US17/726291	US11670449	6/6/2023	Receiver unit of a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
324845-US-7	US	5/22/2023	US18/321434	US11955274	4/9/2024	Receiver unit of a wireless power transfer system	Dolby Intellectual Property Licensing, LLC	Active
325284-US-1	US	5/18/2018	US15/983668	US10673273	6/2/2020	Distributed ledger based control of large-scale, power grid energy resources	Dolby Intellectual Property Licensing, LLC	Active
325450-US-1	US	1/2/2019	US16/238348	US10924106	2/16/2021	Miller transition control gate drive circuit	Dolby Intellectual Property Licensing, LLC	Active
325450-US-2	US	1/13/2021	US17/148340	US11381236	7/5/2022	Miller transition control gate drive circuit	Dolby Intellectual Property Licensing, LLC	Active
326309-US-1	US	1/22/2019	US16/253390	US11395920	7/26/2022	Brain connectivity atlas for personalized functional neurosurgery targeting and brain stimulation programming	Joint ownership - Dolby Intellectual Property Licensing, LLC and University Health Network	Active
327645-IN-1	IN	9/7/2018	IN201843033690A	IN425957	3/24/2023	Integrated electronic component of a receiver unit of a	Dolby Intellectual Property Licensing, LLC	Active
502201-CN-3	CN	4/20/2020	CN202080025845A	CN113646409	3/29/2024	Method for enhancing the stability and dispersibility of phosphors and the resulting phosphors	Dolby Intellectual Property Licensing, LLC	Active
502201-CN-9	CN	4/20/2020	CN202310994966A	CN117025197	11/10/2023	åŒžå¼ºç£·å…‰ä½“çˆ³å¥½æ€§å°'Œå˜†æ•£æ€§ç„æ–¹å‘•å Šæ‰€å¾——çš„ç£·å…‰ä½“	Dolby Intellectual Property Licensing, LLC	Active
502201-EP-4	EP	4/20/2020	EP20809356A	EP3973034	3/30/2022	Method to enhance phosphor robustness and dispersability and resulting phosphors	Dolby Intellectual Property Licensing, LLC	Active
502201-JP-5	JP	4/20/2020	JP2021560923A	JP2022533904	7/27/2022	è›å…‰ä½“ã®å …ç‰¢æ€§ã‚Šã‚ã‚ˆã†æ•£æ€§ã,'é«˜ã,ã,‹æ–¹æ³•ã,‰ã³ã«ã¾ã,‰ã,Œã,‹è›å…‰ä½“	Dolby Intellectual Property Licensing, LLC	Active
502201-KR-6	KR	4/20/2020	KR20217041809A	KR20210158413	12/30/2021	Methods and resulting phosphors for improving the stiffness and dispersibility of phosphors	Dolby Intellectual Property Licensing, LLC	Active
502201-US-1	US	5/22/2019	US16/419206	US11261375	3/1/2022	Method to enhance phosphor robustness and dispersability and resulting phosphors	Dolby Intellectual Property Licensing, LLC	Active
502201-US-8	US	1/18/2022	US17/578335	US11746288	9/5/2023	Method to enhance phosphor robustness and dispersability and resulting phosphors	Dolby Intellectual Property Licensing, LLC	Active

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502452-US-1	US	7/30/2019	US16/525807	US11693763	7/4/2023	Resilient estimation for grid situational awareness	Dolby Intellectual Property Licensing, LLC	Active
502615-US-1	US	1/22/2019	US16/253430	US11273310	3/15/2022	Systems and methods for predicting optimal deep brain stimulation parameters	Joint ownership - Dolby Intellectual Property Licensing, LLC and Albany Medical College	Active
508774-CN-5	CN	12/9/2020	CN202080084415A	CN114787700	7/22/2022	Display with extended color gamut coverage and low blue light emission	Dolby Intellectual Property Licensing, LLC	Active
508774-EP-6	EP	12/9/2020	EP20899397A	EP4073579	10/19/2022	Displays with expanded gamut coverage and low blue light emission	Dolby Intellectual Property Licensing, LLC	Active
508774-JP-7	JP	12/9/2020	JP2022533317A	JP2023505179	2/8/2023	æ<¡å¼µã•ã,Œã‰²åŸŸã,«ãƒãƒƒãƒ—ã,åŠ¹ã½Žé‘è‰²ç™ºå…‰ã‚‚ã,'æœ‰ã™ã,<ãƒ‡ã,£ã,¹ãƒ—ã,¤	Dolby Intellectual Property Licensing, LLC	Active
508774-KR-8	KR	12/9/2020	KR20227023388A	KR20220110563	8/8/2022	Display with extended color gamut coverage and low green light emission	Dolby Intellectual Property Licensing, LLC	Active
508774-TW-3	TW	12/9/2020	TW109143525A	TW202129383	8/1/2021	Displays with expanded gamut coverage and low blue light emission	Dolby Intellectual Property Licensing, LLC	Active
508774-US-4	US	12/9/2020	US17/783626	US20230007906	1/12/2023	Displays with expanded gamut coverage and low blue light emission	Dolby Intellectual Property Licensing, LLC	Active
508774-VN-9	VN		1-2022-04297	N/A			Dolby Intellectual Property Licensing, LLC	Active
509591-CN-7	CN	1/19/2021	CN202180042068A	CN115698199	2/3/2023	Ink composition and film with narrow-band emission phosphor material	Dolby Intellectual Property Licensing, LLC	Active
509591-EP-10	EP	1/19/2021	EP21788285A	EP4136177	2/22/2023	Ink compositions and films with narrow band emission phosphor materials	Dolby Intellectual Property Licensing, LLC	Active
509591-JP-11	JP	1/19/2021	JP2022562355A	JP2023521844A	5/25/2023		Dolby Intellectual Property Licensing, LLC	Active
509591-KR-12	KR	1/19/2021	KR20227039632A	KR20220165280	12/14/2022	Ink compositions and films containing narrowband light emitting phosphor materials	Dolby Intellectual Property Licensing, LLC	Active
509591-TW-6	TW	4/8/2021	TW110112714A	TW202204535	2/1/2022	Ink compositions and films with narrow band emission phosphor materials	Dolby Intellectual Property Licensing, LLC	Active
509591-US-14	US	1/5/2023	US18/150675	US20230279254	9/7/2023	Films with narrow band emission phosphor materials	Dolby Intellectual Property Licensing, LLC	Active
509591-US-4	US	1/19/2021	US17/152736	US11312876	4/26/2022	Ink compositions with narrow band emission phosphor materials	Dolby Intellectual Property Licensing, LLC	Active
509591-US-5	US	1/19/2021	US17/152751	US11254864	2/22/2022	Films with narrow band emission phosphor materials	Dolby Intellectual Property Licensing, LLC	Active
509591-US-8	US	12/16/2021	US17/552648	US11578225	2/14/2023	Films with narrow band emission phosphor materials	Dolby Intellectual Property Licensing, LLC	Active
509591-US-9	US	3/22/2022	US17/701592	US11781028	10/10/2023	Ink compositions with narrow band emission phosphor materials	Dolby Intellectual Property Licensing, LLC	Active
509730-CN-6	CN	4/13/2021	CN202180042076A	CN115667457	1/31/2023	Green light emitting phosphor and device thereof	Dolby Intellectual Property Licensing, LLC	Active
509730-EP-7	EP	4/13/2021	EP21788570A	EP4136187	2/22/2023	Green-emitting phosphors and devices thereof	Dolby Intellectual Property Licensing, LLC	Active
509730-JP-8	JP	4/13/2021	JP2022562412A	JP2023522185A	5/29/2023		Dolby Intellectual Property Licensing, LLC	Active
509730-KR-9	KR	4/13/2021	KR20227039624A	KR20220164603	12/13/2022	Green light emitting phosphor and device thereof	Dolby Intellectual Property Licensing, LLC	Active
509730-TW-5	TW	4/14/2021	TW110113479A	TW202146627	12/16/2021	Green-emitting phosphors and devices thereof	Dolby Intellectual Property Licensing, LLC	Active

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509730-US-11	US	4/13/2021	US17/919180	US20230159824	5/25/2023	Green-emitting phosphors and devices thereof	Dolby Intellectual Property Licensing, LLC	Active
509730-VN-10	VN		1-2022-07315	N/A			Dolby Intellectual Property Licensing, LLC	Active
509746-CN-4	CN	7/16/2021	CN202180063952A	CN116746018	9/12/2023	Power controller in a wireless power receiving device	Dolby Intellectual Property Licensing, LLC	Active
509746-EP-5	EP	7/16/2021	EP21755865A	EP4183015	5/24/2023	Power controller in a wireless power reception apparatus	Dolby Intellectual Property Licensing, LLC	Active
509746-IN-1	IN	7/20/2020	IN202011030957A	IN202011030957	1/21/2022	Power controller in a wireless power reception apparatus	Dolby Intellectual Property Licensing, LLC	Active
509746-JP-6	JP	7/16/2021	JP2023504162A	JP2023534830A	8/14/2023		Dolby Intellectual Property Licensing, LLC	Active
509746-KR-7	KR	7/16/2021	KR20237005678A	KR20230038572	3/20/2023	Power controller in wireless power receiver	Dolby Intellectual Property Licensing, LLC	Active
509746-US-3	US	7/16/2021	US18/006208	US20230283117	9/7/2023	Power controller in a wireless power reception apparatus	Dolby Intellectual Property Licensing, LLC	Active
602226-CN-4	CN	12/8/2021	CN202180092352A	CN116830421	9/29/2023	Pulse width communication in a wireless power system	Dolby Intellectual Property Licensing, LLC	Active
602226-EP-5	EP	12/8/2021	EP21835913A	EP4260433	10/18/2023	Pulse width communication in a wireless power system	Dolby Intellectual Property Licensing, LLC	Active
602226-IN-1	IN	12/8/2020	IN202011053481A	IN202011053481	6/10/2022	Pulse width communication in a wireless power system	Dolby Intellectual Property Licensing, LLC	Active
602226-JP-6	JP	12/8/2021	JP2023534590A	JP2023553065A	12/20/2023		Dolby Intellectual Property Licensing, LLC	Active
602226-KR-7	KR	12/8/2021	KR20237022697A	KR20230118135	8/10/2023	Pulse width communication in wireless power systems	Dolby Intellectual Property Licensing, LLC	Active
602226-US-3	US	12/8/2021	US18/256539	US20240030754	1/25/2024	Pulse width communication in a wireless power system	Dolby Intellectual Property Licensing, LLC	Active
602226-VN-8	VN		1-2023-04458	N/A			Dolby Intellectual Property Licensing, LLC	Active
602751-CN-4	CN	8/31/2021	CN202180072958A	CN116348571	6/27/2023	Device compatible with night vision device	Dolby Intellectual Property Licensing, LLC	Active
602751-EP-5	EP	8/31/2021	EP21865000A	EP4208521	7/12/2023	Devices compatible with night vision equipment	Dolby Intellectual Property Licensing, LLC	Active
602751-JP-6	JP	8/31/2021	JP2023513904A	JP2023539329A	9/13/2023		Dolby Intellectual Property Licensing, LLC	Active
602751-KR-7	KR	8/31/2021	KR20237009153A	KR20230059803	5/3/2023	Element compatible with night vision equipment	Dolby Intellectual Property Licensing, LLC	Active
602751-TW-3	TW	9/1/2021	TW110132488A	TW202227591	7/16/2022	Devices compatible with night vision equipment	Dolby Intellectual Property Licensing, LLC	Active
602751-US-9	US	3/1/2023	US18/116260	US20230246013	8/3/2023	Devices compatible with night vision equipment	Dolby Intellectual Property Licensing, LLC	Active
602751-VN-8	VN		1-2023-02042	N/A			Dolby Intellectual Property Licensing, LLC	Active
605665-CN-7	CN	4/13/2022	CN202280033927A	CN117296162	12/26/2023	Uranium-based phosphor and composition for display and lighting applications	Dolby Intellectual Property Licensing, LLC	Active
605665-EP-8	EP	4/13/2022	EP22788838A	EP4324034	2/21/2024	Uranium-based phosphors and compositions for displays and lighting applications	Dolby Intellectual Property Licensing, LLC	Active

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605665-KR-10	KR	4/13/2022	KR20237038320A	KR20230170708	12/19/2023	Uranium-based phosphors and compositions for display and lighting applications	Dolby Intellectual Property Licensing, LLC	Active
605665-TW-3	TW	4/13/2022	TW111114071A	TW202249302	12/16/2022	Uranium-based phosphors and compositions for displays and lighting applications	Dolby Intellectual Property Licensing, LLC	Active
605665-TW-5	TW	10/11/2022	TW111138506A	TW202328399	7/16/2023	Uranium-based phosphors and compositions for displays and lighting applications	Dolby Intellectual Property Licensing, LLC	Active
605665-US-6	US	10/14/2022	US17/966638	US20230287265	9/14/2023	Uranium-based phosphors and compositions for displays and lighting applications	Dolby Intellectual Property Licensing, LLC	Active
607692A-TW-2	TW	4/7/2023	TW112113158A	TW202403016	1/16/2024		Dolby Intellectual Property Licensing, LLC	Active
607692A-WO-1	WO	4/6/2023	US2023065472W	WO2023215670	11/9/2023	Phosphor compositions and devices thereof	Dolby Intellectual Property Licensing, LLC	Active
607692B-TW-2	TW	5/4/2023	TW112116636A	TW202407080	2/16/2024		Dolby Intellectual Property Licensing, LLC	Active
607692B-WO-1	WO	5/4/2023	US2023020966W	WO2023215457	11/9/2023	Red-emitting phosphors having small particle size, processes for preparing and devices thereof	Dolby Intellectual Property Licensing, LLC	Active
607693-TW-5	TW	5/4/2023	TW112116639A	TW202407059	2/16/2024		Dolby Intellectual Property Licensing, LLC	Active
607693-WO-2	WO	5/4/2023	US2023020927W	WO2023215433	11/9/2023	Systems and methods for depositing phosphor containing ink	Dolby Intellectual Property Licensing, LLC	Active
RD27644-US-2	US	10/26/2000	US09/697562	US7287087	10/23/2007	Communications network for dynamic reprioritization	Dolby Intellectual Property Licensing, LLC	Active
RD28356-DE-4	DE	2/26/2007	EP07751816A	EP1999230	6/13/2012	Red line emitting phosphors for use in led applications	Dolby Intellectual Property Licensing, LLC	Active
RD28356-GB-5	GB	2/26/2007	EP07751816A	EP1999230	6/13/2012	Red line emitting phosphors for use in led applications	Dolby Intellectual Property Licensing, LLC	Active
RD28356-US-1	US	2/2/2005	US11/049598	US7358542	4/15/2008	Red emitting phosphor materials for use in led and lcd applications	Dolby Intellectual Property Licensing, LLC	Active
604111-WO-3	WO	3/24/2023	US2023016265W	WO2023183590	9/28/2023	Safety and security of cyber-physical systems connected through iot network	Dolby Intellectual Property Licensing, LLC	Active
508927-US-1	US	9/20/2021	US17/479370	US12067124	8/20/2024	Systems and methods for node selection and ranking in cyber-physical systems	Dolby Intellectual Property Licensing, LLC	Active
606915-WO-2	WO	5/22/2023	US2023067283W	WO2023230434	11/30/2023	Distributed anomaly detection and localization for cyber-physical systems	Dolby Intellectual Property Licensing, LLC	Active
607309-WO-2	WO	9/11/2023	US2023073880W	WO2024055044	3/14/2024	System and method for distributed quantum entanglement	Dolby Intellectual Property Licensing, LLC	Active
602905-US-1	US	8/19/2021	US17/406205	US20230071394	3/9/2023	Systems and methods for cyber-fault detection	Dolby Intellectual Property Licensing, LLC	Active
602905-EP-4	EP	8/19/2022	EP22859418A	EP4388423	6/26/2024	Systems and methods for cyber-fault detection	Dolby Intellectual Property Licensing, LLC	Active
602922-US-1	US	8/19/2021	US17/406246	US20230075736	3/9/2023	Systems and methods for self-adapting neutralization against cyber-faults	Dolby Intellectual Property Licensing, LLC	Active
602922-EP-4	EP	8/19/2022	EP22859420A	EP4388435	6/26/2024	Systems and methods for self-adapting neutralization against cyber-faults	Dolby Intellectual Property Licensing, LLC	Active
145823-US-1	US	11/15/2004	US10/990193	US7327113	2/5/2008	Electric starter generator system employing bidirectional buck-boost power converters, and methods therefor	Dolby Intellectual Property Licensing, LLC	Active

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162711-JP-5	JP	6/25/2007	JP2007165724A	JP5202882	6/5/2013	Micro-electromechanical system based arcless switching with circuitry to absorb electrical energy during fault conditions	Dolby Intellectual Property Licensing, LLC	Active
162711-KR-6	KR	6/26/2007	KR20070063322A	KR101445386	9/26/2014	Micro-electromechanical system based arc-less switching with circuitry for absorbing electrical energy during a fault condition	Dolby Intellectual Property Licensing, LLC	Active
162711-MX-7	MX	11/27/2007	MX2007014897A	MX2007014897	2/19/2009	Micro-electromechanical system based arc-less switching with circuitry for absorbing electrical energy during a fault condition.	Dolby Intellectual Property Licensing, LLC	Active
162711-US-8	US	12/14/2010	US12/967526	US8050000	11/1/2011	Micro-electromechanical system based arc-less switching with circuitry for absorbing electrical energy during a fault condition	Dolby Intellectual Property Licensing, LLC	Active
162711-FR-10	FR	6/19/2007	EP07110553A	EP1928005	9/25/2013	Micro-electromechanical system based arc-less switching with circuity for absorbing electrical energy during a fault condition	Dolby Intellectual Property Licensing, LLC	Active
216634-CN-3	CN	2/13/2008	CN200880010725A	CN101646747	9/18/2013	Red line emitting phosphors for use in led applications	Dolby Intellectual Property Licensing, LLC	Active
216634-KR-4	KR	2/13/2008	KR20097019091A	KR101623482	5/23/2016	Red line emitting phosphors for use in led applications	Dolby Intellectual Property Licensing, LLC	Active
216634-CN-5	CN	2/13/2008	CN201310351655A	CN103400926	12/8/2017	Red line emitting phosphors for led applications	Dolby Intellectual Property Licensing, LLC	Active
216634-JP-8	JP	10/31/2014	JP2014222926A	JP2015084327	4/30/2015	Red color line discharge|release fluorescent substance for using it for a light emitting diode use	Dolby Intellectual Property Licensing, LLC	Active
216634-JP-9	JP	5/11/2016	JP2016095402A	JP2016181705	10/13/2016	Red color line discharge|release fluorescent substance for using it for a light emitting diode use	Dolby Intellectual Property Licensing, LLC	Active
216634-KR-10	KR	2/13/2008	KR20157009504A	KR101731741	4/28/2017	Red line emitting phosphors for use in led applications	Dolby Intellectual Property Licensing, LLC	Active
216634-JP-12	JP	5/8/2017	JP2017092503A	JP6625582	12/25/2019	Red color line discharge|release fluorescent substance for using it for a light emitting diode use	Dolby Intellectual Property Licensing, LLC	Active
236159-US-3	US	3/23/2010	US12/729297	US8647767	2/11/2014	Sodium-metal-halide energy storage device with sodium level control mechanism	Dolby Intellectual Property Licensing, LLC	Active
239040-US-16	US	1/24/2024	US18/421275	US20240157821	5/16/2024	Apparatus and method for rapid charging using shared power electronics	Dolby Intellectual Property Licensing, LLC	Active
241497-CN-2	CN	12/16/2010	CN201010615732A	CN102103945	1/1/2014	Switch structure and associated circuit	Dolby Intellectual Property Licensing, LLC	Active
241497-JP-4	JP	12/8/2010	JP2010273081A	JP2011129516	6/30/2011	Switch structure and associated circuit	Dolby Intellectual Property Licensing, LLC	Active
241497-KR-5	KR	12/16/2010	KR20100129440A	KR101737120	5/17/2017	Switch structure and associated circuit	Dolby Intellectual Property Licensing, LLC	Active
241497-DE-6	DE	12/10/2010	EP10194449A	EP2337043	3/30/2016	Switch structure and associated circuit	Dolby Intellectual Property Licensing, LLC	Active
246663-US-1	US	6/27/2011	US13/169220	US9964625	5/8/2018	Electrical substation fault monitoring and diagnostics	Dolby Intellectual Property Licensing, LLC	Active
246941-US-2	US	12/30/2010	US12/981846	US8789969	7/29/2014	Compact led light engine with reflector cups and highly directional lamps using same	Dolby Intellectual Property Licensing, LLC	Active
265951-CA-4	CA	10/26/2015	CA2968353A	CA2968353	6/27/2023	Multichannel relay assembly with in line mems switches	Dolby Intellectual Property Licensing, LLC	Active
277187-CA-4	CA	4/5/2016	CA3018505A	CA3018505	10/12/2017	Activated platelet composition with tunable growth factor level	Dolby Intellectual Property Licensing, LLC	Active

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281133-CA-4	CA	12/29/2016	CA3009523A	CA3009523	7/6/2017	Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
281133-KR-12	KR	12/29/2016	KR20187022044A	KR20180098402	9/3/2018	Activation of calcium control of platelets by electrical stimulation	Dolby Intellectual Property Licensing, LLC	Active
307094-US-7	US	11/16/2010	US12/947244	US9077002	7/7/2015	Fuel cell system and operating method	Dolby Intellectual Property Licensing, LLC	Active
314859-GB-6	GB	10/20/2017	EP17794516A	EP3555640	7/3/2024	Dc leakage current detector and method of operation thereof for leakage current detector in dc power circuits	Dolby Intellectual Property Licensing, LLC	Active
315132-US-3	US	10/7/2008	US12/247157	US8006136	8/23/2011	Automatic grammar based fault detection and isolation	Dolby Intellectual Property Licensing, LLC	Active
315166-US-2	US	2/27/2009	US12/395235	US8132053	3/6/2012	System and method for grammar based test planning	Dolby Intellectual Property Licensing, LLC	Active
315166-US-4	US	3/2/2012	US13/411379	US8489926	7/16/2013	System and method for grammar based test planning	Dolby Intellectual Property Licensing, LLC	Active
315166-US-5	US	7/12/2013	US13/941378	US8738967	5/27/2014	System and method for grammar based test planning	Dolby Intellectual Property Licensing, LLC	Active
315166-US-6	US	4/10/2014	US14/249805	US9122671	9/1/2015	System and method for grammar based test planning	Dolby Intellectual Property Licensing, LLC	Active
315170-US-3	US	2/27/2009	US12/395363	US8433542	4/30/2013	Testing framework for control devices	Dolby Intellectual Property Licensing, LLC	Active
315170-US-4	US	9/14/2012	US13/620532	US8949063	2/3/2015	Testing framework for control devices	Dolby Intellectual Property Licensing, LLC	Active
315170-US-5	US	1/30/2015	US14/610920	US9400725	7/26/2016	Testing framework for control devices	Dolby Intellectual Property Licensing, LLC	Active
317707-VN-8	VN		1-2020-02139	N/A			Dolby Intellectual Property Licensing, LLC	Active
318587-CN-8	CN	8/31/2017	CN202410515485A	CN118428831	8/2/2024		Dolby Intellectual Property Licensing, LLC	Active
322985-CN-7	CN	2/25/2019	CN202410625931A	CN118509176	8/16/2024	ä¿¡fè¿›å·¥ã‚šæ•°æ®é™Œè¯ç‚¹ç³»ç»Ÿå·²ä¸Žå·¥ä‚šæ•°æ®é™Œè¯ç›¸å…³è”ç‚¹æ–¹æ³•	Dolby Intellectual Property Licensing, LLC	Active
502201-VN-7	VN		1-2021-07462	N/A			Dolby Intellectual Property Licensing, LLC	Active
509591-VN-13	VN		1-2022-07394	N/A			Dolby Intellectual Property Licensing, LLC	Active
509591-CN-15	CN	1/19/2021	CN202311774912A	CN117986927	5/7/2024	Ink composition and film with narrow-band emissive phosphor material	Dolby Intellectual Property Licensing, LLC	Active
509591-TW-16	TW		113103075	N/A			Dolby Intellectual Property Licensing, LLC	Active
509591-EP-17	EP	1/19/2021	EP24160690A	EP4410911	8/7/2024	Ink compositions and films with narrow band emission phosphor materials	Dolby Intellectual Property Licensing, LLC	Active
602928-US-1	US		63/643,693	N/A			Dolby Intellectual Property Licensing, LLC	Active
605665-JP-9	JP	4/13/2022	JP2023562814A	JP2024517092	4/19/2024	ã,¡ãƒ©ãƒ¾ç³»è›å…‰ä½“ã,¡ã³ã«ãƒ‡ã,£ã,¹ãƒ—ãƒ¬ã,¤ãƒ‡ã³ç…§æ˜Žç”¨é€”ã®ä¸Žã,ã®çµ„æˆç‰©	Dolby Intellectual Property Licensing, LLC	Active
605665-VN-11	VN		1-2023-07887	N/A			Dolby Intellectual Property Licensing, LLC	Active
605665-CN-12	CN	10/10/2022	CN202280067631A	CN118076710	5/24/2024	Uranium-based phosphors and compositions for displays and lighting applications	Dolby Intellectual Property Licensing, LLC	Active

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605665-EP-13	EP	10/10/2022	EP22879550A	EP4413090	8/14/2024	Uranium-based phosphors and compositions for displays and lighting applications	Dolby Intellectual Property Licensing, LLC	Active
605665-KR-15	KR	10/10/2022	KR20247010819A	KR20240087778	6/19/2024	Uranium-based phosphors and compositions for displays and lighting applications	Dolby Intellectual Property Licensing, LLC	Active
605665-VN-16	VN		1-2024-03133	N/A			Dolby Intellectual Property Licensing, LLC	Active
605665-BR-18	BR		BR112024006755-6	N/A			Dolby Intellectual Property Licensing, LLC	Active
605665-MY-20	MY		PI 2024001746	N/A			Dolby Intellectual Property Licensing, LLC	Active
605665-MX-21	MX		MX/a/2024/004161	N/A			Dolby Intellectual Property Licensing, LLC	Active
607693-US-3	US		63/453,396	N/A			Dolby Intellectual Property Licensing, LLC	Active
607693-US-4	US		63/498,414	N/A			Dolby Intellectual Property Licensing, LLC	Active
607693-US-7	US	11/6/2023	US18/502765	US20240117208	4/11/2024	Systems and methods for depositing phosphor containing ink	Dolby Intellectual Property Licensing, LLC	Active
608197-US-2	US		63/642,183	N/A			Dolby Intellectual Property Licensing, LLC	Active
610280-US-1	US		63/561,973	N/A			Dolby Intellectual Property Licensing, LLC	Active
610288-US-1	US		63/561,999	N/A			Dolby Intellectual Property Licensing, LLC	Active
610319-US-1	US		63/555,346	N/A			Dolby Intellectual Property Licensing, LLC	Active
610601-US-1	US		63/644,203	N/A			Dolby Intellectual Property Licensing, LLC	Active
610770-KR-2	KR	5/29/2015	KR20150076499A	KR102441273	9/8/2022	Light emitting diode package and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
610770-KR-3	KR	9/2/2022	KR20220111153A	KR102596919	11/2/2023	Light emitting diode package	Dolby Intellectual Property Licensing, LLC	Active
610770-KR-4	KR	10/27/2023	KR20230145352A	KR20230154778	11/9/2023	Light emitting diode package	Dolby Intellectual Property Licensing, LLC	Active
610770-US-5	US	8/18/2015	US14/828937	US9741907	8/22/2017	Light emitting diode package and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
610770-US-6	US	7/10/2017	US15/645632	US10249801	4/2/2019	Light emitting diode package and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
610770-US-7	US	4/1/2019	US16/371774	US10424697	9/24/2019	Light emitting diode package and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
610770-CN-9	CN	8/18/2015	CN201510509309A	CN105374922	9/21/2018	Light emission diode package member and its manufacturing method	Dolby Intellectual Property Licensing, LLC	Active
610770-CN-10	CN	8/18/2015	CN201810952946A	CN109181685	1/11/2019	Light emission diode package member and its manufacturing method	Dolby Intellectual Property Licensing, LLC	Active
610770-EP-11	EP	8/10/2015	EP15180388A	EP2988340	10/11/2017	Light emitting diode package and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
610770-FR-13	FR	8/10/2015	EP15180388A	EP2988340	10/11/2017	Light emitting diode package and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
610770-DE-14	DE	8/10/2015	EP15180388A	EP2988340	10/11/2017	Light emitting diode package and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active
610770-GB-15	GB	8/10/2015	EP15180388A	EP2988340	10/11/2017	Light emitting diode package and manufacturing method thereof	Dolby Intellectual Property Licensing, LLC	Active

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610772-KR-1	KR	1/28/2011	KR20110008736A	KR101761834	7/27/2017	Wafer level led package and method of fabricating the same	Dolby Intellectual Property Licensing, LLC	Active
610772-US-2	US	1/26/2012	US13/359287	US8592232	11/26/2013	Wafer level led package and method of fabricating the same	Dolby Intellectual Property Licensing, LLC	Active
610772-US-3	US	11/7/2013	US14/074098	US8916898	12/23/2014	Wafer level led package and method of fabricating the same	Dolby Intellectual Property Licensing, LLC	Active
610772-TW-4	TW	1/30/2012	TW101102898A	TWI528595	4/1/2016	Wafer level led package and method of fabricating the same	Dolby Intellectual Property Licensing, LLC	Active
610772-CN-6	CN	1/13/2012	CN201280006927A	CN103339749	3/30/2016	Wafer led packaging part and manufacture this method	Dolby Intellectual Property Licensing, LLC	Active
610772-FR-11	FR	1/13/2012	EP14150304A	EP2720283	5/16/2018	Wafer-level light emitting diode package	Dolby Intellectual Property Licensing, LLC	Active
610772-DE-12	DE	1/13/2012	EP14150304A	EP2720283	5/16/2018	Wafer-level light emitting diode package	Dolby Intellectual Property Licensing, LLC	Active
610772-IT-13	IT	1/13/2012	EP14150304A	EP2720283	5/16/2018	Wafer-level light emitting diode package	Dolby Intellectual Property Licensing, LLC	Active
610772-NL-14	NL	1/13/2012	EP14150304A	EP2720283	5/16/2018	Wafer-level light emitting diode package	Dolby Intellectual Property Licensing, LLC	Active
610772-GB-15	GB	1/13/2012	EP14150304A	EP2720283	5/16/2018	Wafer-level light emitting diode package	Dolby Intellectual Property Licensing, LLC	Active
610772-DE-16	DE	1/13/2012	EP12739572A	EP2669963	8/22/2018	Method of fabricating a light emitting diode package	Dolby Intellectual Property Licensing, LLC	Active
610773-KR-1	KR	1/7/2010	KR20100001089A	KR101618799	5/9/2016	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-KR-2	KR	1/7/2010	KR20100001090A	KR101618800	5/9/2016	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-KR-3	KR	1/7/2010	KR20100001204A	KR101615277	4/25/2016	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-KR-4	KR	1/7/2010	KR20100001205A	KR101615283	4/25/2016	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-KR-5	KR	1/7/2010	KR20100001408A	KR101623952	5/24/2016	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-KR-6	KR	1/8/2010	KR20100001813A	KR101623951	5/24/2016	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-US-11	US	9/14/2012	US13/617810	US8436369	5/7/2013	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-US-12	US	4/15/2013	US13/862713	US8742449	6/3/2014	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-US-13	US	3/28/2014	US14/229672	US9012952	4/21/2015	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-US-14	US	3/31/2014	US14/231043	US9018669	4/28/2015	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-US-15	US	3/11/2015	US14/645227	US9419180	8/16/2016	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-US-16	US	7/1/2016	US15/200633	US9793440	10/17/2017	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-CN-17	CN	1/7/2011	CN201110006046A	CN102122694	7/3/2013	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active

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610773-EP-18	EP	1/4/2011	EP11150117A	EP2343744	3/11/2020	Light emitting diode with patterned electrodes	Dolby Intellectual Property Licensing, LLC	Active
610773-TW-19	TW	1/4/2011	TW100100166A	TWI412165	10/11/2013	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-JP-21	JP	1/5/2011	JP2011000833A	JP2011142324	7/21/2011	Light emitting diode having a plurality of electrode pads	Dolby Intellectual Property Licensing, LLC	Active
610773-JP-22	JP	5/28/2015	JP2015109013A	JP2015173289	10/1/2015	The light emitting diode which has several electrode pad	Dolby Intellectual Property Licensing, LLC	Active
610773-JP-23	JP	11/16/2016	JP2016223502A	JP6574750	9/11/2019	Light emitting diode	Dolby Intellectual Property Licensing, LLC	Active
610773-FR-24	FR	1/4/2011	EP11150117A	EP2343744	3/11/2020	Light emitting diode with patterned electrodes	Dolby Intellectual Property Licensing, LLC	Active
610773-DE-25	DE	1/4/2011	EP11150117A	EP2343744	3/11/2020	Light emitting diode with patterned electrodes	Dolby Intellectual Property Licensing, LLC	Active
610773-GB-26	GB	1/4/2011	EP11150117A	EP2343744	3/11/2020	Light emitting diode with patterned electrodes	Dolby Intellectual Property Licensing, LLC	Active
RD28356-FR-3	FR	2/26/2007	EP07751816A	EP1999230	6/13/2012	Red line emitting phosphors for use in led applications	Dolby Intellectual Property Licensing, LLC	Active
RD28356-NL-6	NL	2/26/2007	EP07751816A	EP1999230	6/13/2012	Red line emitting phosphors for use in led applications	Dolby Intellectual Property Licensing, LLC	Active
RD28356-JP-8	JP	2/26/2007	JP2008557338A	JP5715327	5/7/2015	Red line emitting phosphors for use in light emitting diode applications	Dolby Intellectual Property Licensing, LLC	Active
281133-RU-19	RU	12/29/2016	2021102581			CALCIUM CONTROLLED ACTIVATION OF PLATELETS VIA ELECTRICAL STIMULATION	Dolby Intellectual Property Licensing, LLC	Active
281133-RU-25	RU	12/29/2016	2024115920			CALCIUM CONTROLLED ACTIVATION OF PLATELETS VIA ELECTRICAL STIMULATION	Dolby Intellectual Property Licensing, LLC	Active
285990-US-12	US	4/4/2024	18/627,213	US-2024-0333034-A1	10/3/2024	SYSTEM AND METHOD FOR PROTECTING A WIRELESS POWER TRANSFER SYSTEM	Dolby Intellectual Property Licensing, LLC	Active
285990-JP-13	JP	1/30/2017	2024-133554			SYSTEM AND METHOD FOR PROTECTING A WIRELESS POWER TRANSFER SYSTEM	Dolby Intellectual Property Licensing, LLC	Active
314859-UP-5	UP	9/2/2024	17794516.9	3555640		DC LEAKAGE CURRENT DETECTOR AND METHOD OF OPERATION THEREOF FOR LEAKAGE CURRENT DETECTION IN DC POWER CIRCUITS	Dolby Intellectual Property Licensing, LLC	Active
318543-US-9	US	3/15/2024	18/606,235			INTELLECTUAL PROPERTY EXCHANGE ECOSYSTEM FOR ADDITIVE MANUFACTURING	Dolby Intellectual Property Licensing, LLC	Active
319318-CN-5	CN	4/19/2018	2.0241E+11	CN117977825A	5/3/2024	A POWER TRANSFER DEVICE AND AN ASSOCIATED METHOD THEREOF	Dolby Intellectual Property Licensing, LLC	Active
319319-CN-6	CN		2.02411E+12	CN118413013A	7/30/2024	Dual Band Concentric Coil toplogy for Universal Charging Pad	Dolby Intellectual Property Licensing, LLC	Active
319620-KR-8	KR	8/21/2018	10-2024-7026143			TRUE TIME DELAY BEAM FORMER MODULE AND METHOD OF MAKING THE SAME	Dolby Intellectual Property Licensing, LLC	Active

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319639-FR-7	FR	8/27/2018	18869267.7	3698429		HIGH IMPEDANCE RF MEMS TRANSMISSION DEVICES AND METHOD OF MAKING THE SAME	Dolby Intellectual Property Licensing, LLC	Active
319639-DE-8	DE	8/27/2018	18869267.7	3698429		HIGH IMPEDANCE RF MEMS TRANSMISSION DEVICES AND METHOD OF MAKING THE SAME	Dolby Intellectual Property Licensing, LLC	Active
319639-GB-9	GB	8/27/2018	18869267.7	3698429		HIGH IMPEDANCE RF MEMS TRANSMISSION DEVICES AND METHOD OF MAKING THE SAME	Dolby Intellectual Property Licensing, LLC	Active
320002-US-13	US		May be filed			HIERARCHICAL DATA EXCHANGE MANAGEMENT SYSTEM	Dolby Intellectual Property Licensing, LLC	Active
324845-US-9	US	4/5/2024	18/627,854	US-2024-0339263-A1	10/10/2024	A RECEIVER UNIT OF A WIRELESS POWER TRANSFER SYSTEM AND AN ASSOCIATED METHOD THEREOF	Dolby Intellectual Property Licensing, LLC	Active
324845-TW-10	TW	4/15/2019	113132609			A RECEIVER UNIT OF A WIRELESS POWER TRANSFER SYSTEM AND AN ASSOCIATED METHOD THEREOF	Dolby Intellectual Property Licensing, LLC	Active
502452-US-2	US	5/22/2023	18/321,545	US-2023-0385186	11/30/2023	Resilient Estimation for Grid Situational Awareness	Dolby Intellectual Property Licensing, LLC	Active
508774-CN-10	CN	12/9/2020	2.02411E+11	CN118981134A	11/19/2024	LIGHT EMITTING DEVICES AND DISPLAYS WITH EXPANDED GAMUT COVERAGE AND LOW BLUE LIGHT EMISSION AND METHODS FOR PRODUCING	Dolby Intellectual Property Licensing, LLC	Active
508774-US-11	US	11/7/2024	18/939878			LIGHT EMITTING DEVICES AND DISPLAYS WITH EXPANDED GAMUT COVERAGE AND LOW BLUE LIGHT EMISSION AND METHODS FOR PRODUCING	Dolby Intellectual Property Licensing, LLC	Active
508774-JP-12	JP		May be filed			LIGHT EMITTING DEVICES AND DISPLAYS WITH EXPANDED GAMUT COVERAGE AND LOW BLUE LIGHT EMISSION AND METHODS FOR PRODUCING	Dolby Intellectual Property Licensing, LLC	Active
508927-CN-3	CN	9/20/2022	May be filed			Systems and Methods for Node Selection and Ranking in Cyber-Physical Systems	Dolby Intellectual Property Licensing, LLC	Active
508927-EP-4	EP	3/19/2024	22871025.7			Systems and Methods for Node Selection and Ranking in Cyber-Physical Systems	Dolby Intellectual Property Licensing, LLC	Active
508927-US-5	US	9/20/2022	May be filed			Systems and Methods for Node Selection and Ranking in Cyber-Physical Systems	Dolby Intellectual Property Licensing, LLC	Active
508927-US-6	US	7/3/2024	18/762,999			Systems and Methods for Node Selection and Ranking in Cyber-Physical Systems	Dolby Intellectual Property Licensing, LLC	Active
509591-US-18	US	11/7/2024	18/939,975			INK FORMULATIONS WITH NARROW BAND EMITTING PHOSPHOR MATERIALS	Dolby Intellectual Property Licensing, LLC	Active
509730-US-12	US		May be filed			GREEN-EMITTING PHOSPHORS AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Active
509730-CN-13	CN	4/13/2021	2.02411E+11			GREEN-EMITTING PHOSPHORS AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Active
602751-US-10	US	11/7/2024	18/939,772			DEVICES COMPATIBLE WITH NIGHT VISION EQUIPMENT	Dolby Intellectual Property Licensing, LLC	Active
602905-CN-3	CN	8/19/2022	May be filed			Systems and Methods for Cyber-Fault Detection	Dolby Intellectual Property Licensing, LLC	Active

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602922-CN-3	CN	8/19/2022	May be filed			Systems and Methods for Self-Adapting Neutralization Against Cyber-Faults	Dolby Intellectual Property Licensing, LLC	Active
604111-US-4	US	3/24/2023	18/850,484			SAFETY AND SECURITY OF CYBER-PHYSICAL SYSTEMS CONNECTED THROUGH IOT NETWORK	Dolby Intellectual Property Licensing, LLC	Active
605665-WO-4	WO	10/10/2022	PCT/US2022/077858	WO/2023/060281	4/13/2023	URANIUM-BASED PHOSPHORS AND COMPOSITIONS FOR DISPLAYS AND LIGHTING APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Active
605665-JP-14	JP	10/10/2022	2024-521064			URANIUM-BASED PHOSPHORS AND COMPOSITIONS FOR DISPLAYS AND LIGHTING APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Active
605665-US-17	US	10/10/2022	18/698,659			URANIUM-BASED PHOSPHORS AND COMPOSITIONS FOR DISPLAYS AND LIGHTING APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Active
605665-IN-19	IN	10/10/2022	2.02417E+11			URANIUM-BASED PHOSPHORS AND COMPOSITIONS FOR DISPLAYS AND LIGHTING APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Active
605665-TH-22	TH	10/10/2022	2401002134			URANIUM-BASED PHOSPHORS AND COMPOSITIONS FOR DISPLAYS AND LIGHTING APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Active
605665-US-23	US		May be filed			URANIUM-BASED PHOSPHORS AND COMPOSITIONS FOR DISPLAYS AND LIGHTING APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Active
606915-CN-3	CN	5/22/2023	May be filed			Distributed Anomaly Detection and Localization for Cyber-Physical Systems	Dolby Intellectual Property Licensing, LLC	Active
606915-EP-4	EP	5/22/2023	May be filed			Distributed Anomaly Detection and Localization for Cyber-Physical Systems	Dolby Intellectual Property Licensing, LLC	Active
606915-US-5	US	5/22/2023	May be filed			Distributed Anomaly Detection and Localization for Cyber-Physical Systems	Dolby Intellectual Property Licensing, LLC	Active
607693-WO-6	WO	11/6/2023	PCT/US2023/036871	WO/2024/196409	9/26/2024	PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
607693-TW-8	TW	11/6/2023	112142720	202438643	10/1/2024	PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
607693-BR-9	BR	5/4/2023	BR 11 2024 023003-1			SYSTEMS AND METHODS FOR DEPOSITING PHOSPHOR CONTAINING INK	Dolby Intellectual Property Licensing, LLC	Active
607693-CN-10	CN	5/4/2023	May be filed			SYSTEMS AND METHODS FOR DEPOSITING PHOSPHOR CONTAINING INK	Dolby Intellectual Property Licensing, LLC	Active
607693-EP-11	EP	5/4/2023	23800008.7			SYSTEMS AND METHODS FOR DEPOSITING PHOSPHOR CONTAINING INK	Dolby Intellectual Property Licensing, LLC	Active
607693-IN-12	IN	5/4/2023	2.02417E+11			SYSTEMS AND METHODS FOR DEPOSITING PHOSPHOR CONTAINING INK	Dolby Intellectual Property Licensing, LLC	Active
607693-JP-13	JP	5/4/2023	2024-564628			SYSTEMS AND METHODS FOR DEPOSITING PHOSPHOR CONTAINING INK	Dolby Intellectual Property Licensing, LLC	Active
607693-KR-14	KR	5/4/2023	10-2024-7039504			SYSTEMS AND METHODS FOR DEPOSITING PHOSPHOR CONTAINING INK	Dolby Intellectual Property Licensing, LLC	Active
607693-MY-15	MY	5/4/2023	PI 2024006294			SYSTEMS AND METHODS FOR DEPOSITING PHOSPHOR CONTAINING INK	Dolby Intellectual Property Licensing, LLC	Active
607693-MX-16	MX	5/4/2023	MX/a/2024/013586			SYSTEMS AND METHODS FOR DEPOSITING PHOSPHOR CONTAINING INK	Dolby Intellectual Property Licensing, LLC	Active

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607693-TH-17	TH	5/4/2023	2401007141			SYSTEMS AND METHODS FOR DEPOSITING PHOSPHOR CONTAINING INK	Dolby Intellectual Property Licensing, LLC	Active
607693-US-18	US	5/4/2023	18/862,598			SYSTEMS AND METHODS FOR DEPOSITING PHOSPHOR CONTAINING INK	Dolby Intellectual Property Licensing, LLC	Active
607693-VN-19	VN	5/4/2023	1-2024-08939			SYSTEMS AND METHODS FOR DEPOSITING PHOSPHOR CONTAINING INK	Dolby Intellectual Property Licensing, LLC	Active
607693-BR-20	BR	11/6/2023	May be filed			PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
607693-CN-21	CN	11/6/2023	May be filed			PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
607693-EP-22	EP	11/6/2023	23928965.5			PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
607693-IN-23	IN	11/6/2023	2.02417E+11			PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
607693-JP-24	JP	11/6/2023	May be filed			PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
607693-KR-25	KR	11/6/2023	10-2024-7039108			PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
607693-MY-26	MY	11/6/2023	PI 2024006810			PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
607693-MX-27	MX	11/6/2023	MX/a/2024/014088			PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
607693-TH-28	TH	11/6/2023	2401007745			PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
607693-VN-29	VN	11/6/2023	May be filed			PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Active
608197-US-3	US	5/3/2024	18/654,432			Method for optically active structures	Dolby Intellectual Property Licensing, LLC	Active
610319-US-3	US	5/3/2024	18/654,635			Remote Phosphor films in reflective geometry	Dolby Intellectual Property Licensing, LLC	Active
610770-JP-12	JP	8/18/2015	2015-161386	2016-042579	3/31/2016	Light emitting diode package	Dolby Intellectual Property Licensing, LLC	Active
607692A-BR-3	BR	4/6/2023	BR112024022907-6			Phosphors, Ink Formulations and FilmsPHOSPHORS, INK FORMULATIONS AND FILMS	Dolby Intellectual Property Licensing, LLC	Active
607692A-CN-4	CN	4/6/2023	May be filed			Phosphors, Ink Formulations and FilmsPHOSPHORS, INK FORMULATIONS AND FILMS	Dolby Intellectual Property Licensing, LLC	Active
607692A-EP-5	EP	4/6/2023	May be filed			Phosphors, Ink Formulations and FilmsPHOSPHORS, INK FORMULATIONS AND FILMS	Dolby Intellectual Property Licensing, LLC	Active
607692A-IN-6	IN	4/6/2023	May be filed			Phosphors, Ink Formulations and FilmsPHOSPHORS, INK FORMULATIONS AND FILMS	Dolby Intellectual Property Licensing, LLC	Active
607692A-US-7	US	4/6/2023	18/862,301			Phosphors, Ink Formulations and FilmsPHOSPHORS, INK FORMULATIONS AND FILMS	Dolby Intellectual Property Licensing, LLC	Active
607692B-BR-3	BR	5/4/2023	May be filed			RED-EMITTING PHOSPHORS HAVING SMALL PARTICLE SIZE, PROCESSES FOR PREPARING AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Active
607692B-CN-4	CN	5/4/2023	May be filed			RED-EMITTING PHOSPHORS HAVING SMALL PARTICLE SIZE, PROCESSES FOR PREPARING AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Active

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607692B-EP-5	EP	5/4/2023	May be filed			RED-EMITTING PHOSPHORS HAVING SMALL PARTICLE SIZE, PROCESSES FOR PREPARING AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Active
607692B-IN-6	IN	5/4/2023	May be filed			RED-EMITTING PHOSPHORS HAVING SMALL PARTICLE SIZE, PROCESSES FOR PREPARING AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Active
607692B-US-7	US	5/4/2023	18/862,583			RED-EMITTING PHOSPHORS HAVING SMALL PARTICLE SIZE, PROCESSES FOR PREPARING AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Active
610799-US-1	US	8/12/2024	63/681,926			Phosphor-based inks as a luminescent materials for sensing applications	Dolby Intellectual Property Licensing, LLC	Active
610841-US-1	US	8/12/2024	63/681,912			Small size red-emitting phosphors via jet milling	Dolby Intellectual Property Licensing, LLC	Active
610842-US-2	US	8/12/2024	63/682,012			Injection and compression molding of Mn4+ doped fluoride phosphors	Dolby Intellectual Property Licensing, LLC	Active
610876-US-1	US	8/12/2024	63/681,936			Combined inorganic and organic coatings of red-emitting potassium hexafluorosilicate phosphors	Dolby Intellectual Property Licensing, LLC	Active
610878-US-1	US	8/12/2024	63/681,942			Phosphor ceramics and glasses	Dolby Intellectual Property Licensing, LLC	Active
610879-US-1	US	8/12/2024	63/681,977			Injection and compression molding of DU green and red phosphors	Dolby Intellectual Property Licensing, LLC	Active
610890-US-1	US	8/12/2024	63/681,974			Scattering agents size and location to optimize blue to red conversion in a blue to red color converted optical part	Dolby Intellectual Property Licensing, LLC	Active
610896-US-1	US	8/12/2024	63/681,999			Phosphor Powder Coating	Dolby Intellectual Property Licensing, LLC	Active
610897-US-1	US	8/12/2024	63/681,990			Phosphor infused ink in retail signage	Dolby Intellectual Property Licensing, LLC	Active
133987-WO-2	Patent Cooperation Treaty	11/18/2004	US04/38666			HYBRID BATTERY CONFIGURATION WITH BI-DIRECTIONAL CONVERTER GRID INTERFACE AND AUXILIARY POWER UNIT	Dolby Intellectual Property Licensing, LLC	Expired
133987-EP-7	European Patent	11/18/2004	4811389.8	EP1697158	10/17/2007	METHOD AND APPARATUS FOR PRODUCING TRACTIVE EFFORT	Dolby Intellectual Property Licensing, LLC	Expired
134730-US-1	United States of America	3/30/2004	10/813945	US6974333	12/13/2005	HIGH-DENSITY CONNECTION BETWEEN MULTIPLE CIRCUIT BOARDS	Dolby Intellectual Property Licensing, LLC	Expired
145823-CN-4	China	11/15/2005	10137343.3	CN1815870		ELECTRIC STARTER GENERATOR EMPLOYING BUCK-BOOST POWER CONVERTERS	Dolby Intellectual Property Licensing, LLC	Expired
145823-CN-7	China	4/6/2012	2.0121E+11	CN201210112687.9	1/20/2016	BIDIRECTIONAL BUCK-BOOST POWER CONVERTER	Dolby Intellectual Property Licensing, LLC	Expired
146125-WO-2	Patent Cooperation Treaty	8/25/2005	US05/30390	WO06/026421		CROSSLINKABLE AND CROSSLINKED POLYMERS	Dolby Intellectual Property Licensing, LLC	Expired
146125-EP-3	European Patent	8/25/2005	5792879.8	EP1784444	8/13/2014	CROSSLINKABLE AND CROSSLINKED POLYMERS	Dolby Intellectual Property Licensing, LLC	Expired
152861-DE-3	Germany (Federal Republic of)	9/7/2005	1.02005E+11	DE102005042622.0		PHOTOVOLTAIC MODULES FOR SOLAR CONCENTRATOR	Dolby Intellectual Property Licensing, LLC	Expired

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152861-JP-5	Japan	9/8/2005	2005-260353			PHOTOVOLTAIC MODULES FOR SOLAR CONCENTRATOR	Dolby Intellectual Property Licensing, LLC	Expired
155850-CN-2	China	6/6/2006	10099642.7	CN200610099642.7	9/9/2009	PHOTOVOLTAIC CONCENTRATOR FOR SOLAR ENERGY SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
155850-EP-3	European Patent	5/25/2006	6252718.9	EP1732141		PHOTOVOLTAIC CONCENTRATOR FOR SOLAR ENERGY SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
155850-JP-4	Japan	6/6/2006	2006-157088			PHOTOVOLTAIC CONCENTRATOR FOR SOLAR ENERGY SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
162191-CN-2	China	6/29/2007	200710126317.X	CN101335141		MICRO-ELECTROMECHANICAL SYSTEM BASED SOFT SWITCHING	Dolby Intellectual Property Licensing, LLC	Expired
162191-EP-3	European Patent	6/19/2007	7110554.8	EP2017870	5/15/2013	MICRO-ELECTROMECHANICAL SYSTEM BASED SOFT SWITCHING	Dolby Intellectual Property Licensing, LLC	Expired
162191-KR-5	Korea, Republic of (KR)	6/29/2007	2007-0065794			MICRO-ELECTROMECHANICAL SYSTEM BASED SOFT SWITCHING	Dolby Intellectual Property Licensing, LLC	Expired
162191-DE-6	Germany (Federal Republic of)	6/19/2007	7110554.8	DE2017870	5/15/2013	MICRO-ELECTROMECHANICAL SYSTEM BASED SOFT SWITCHING	Dolby Intellectual Property Licensing, LLC	Expired
162191-GB-8	United Kingdom	6/19/2007	7110554.8	GB2017870	5/15/2013	MICRO-ELECTROMECHANICAL SYSTEM BASED SOFT SWITCHING	Dolby Intellectual Property Licensing, LLC	Expired
162191-IT-9	Italy	6/19/2007	7110554.8	IT2017870	5/15/2013	MICRO ELECTRO MECHANICAL SYSTEMS MEMS CIRCUIT BREAKER SYSTEM LEVEL CONCEPTS	Dolby Intellectual Property Licensing, LLC	Expired
162667-WO-2	Patent Cooperation Treaty	12/20/2006	US06/49096	WO 2007/081545		HYBRID VEHICLE AND METHOD OF ASSEMBLING SAME	Dolby Intellectual Property Licensing, LLC	Expired
162667-EP-4	European Patent	12/20/2006	6848066.4	EP1976719		HYBRID VEHICLE AND METHOD OF ASSEMBLING SAME	Dolby Intellectual Property Licensing, LLC	Expired
162667-JP-6	Japan	12/20/2006	2008-549500	JP07/081545		HYBRID VEHICLE AND METHOD OF ASSEMBLING SAME	Dolby Intellectual Property Licensing, LLC	Expired
162667-JP-7	Japan	12/20/2006	2013-096100	JP2013177131		PARALLEL HYBRID CONFIGURATION FOR HEAVY DUTY TRUCKS AND BUSES WITH COMBINED BATTERY AND ULTRACAPACITOR ENERGY STORAGE SYSTEM AND INTERFACE	Dolby Intellectual Property Licensing, LLC	Expired
162711-US-1	United States of America	12/20/2005	11/314336	US20070139829A1		MICRO-ELECTROMECHANICAL SYSTEM BASED ARC-LESS SWITCHING	Dolby Intellectual Property Licensing, LLC	Expired
162711-CN-3	China	7/2/2007	2.0071E+11	CN200710127330.7	10/10/2012	Micro-Electromechanical System Based Arc-Less Switching With Circuitry For Absorbing Electrical Energy During A Fault Condition	Dolby Intellectual Property Licensing, LLC	Expired
162711-EP-4	European Patent	6/19/2007	7110553	EP1928005	9/25/2013	Micro-Electromechanical System Based Arc-Less Switching With Circuitry For Absorbing Electrical Energy During A Fault Condition	Dolby Intellectual Property Licensing, LLC	Expired
162711-DE-9	Germany (Federal Republic of)	6/19/2007	7110553	DE1928005	9/25/2013	Micro-Electromechanical System Based Arc-Less Switching With Circuitry For Absorbing Electrical Energy During A Fault Condition	Dolby Intellectual Property Licensing, LLC	Expired

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
162711-GB-11	United Kingdom	6/19/2007	7110553	GB1928005	9/25/2013	Micro-Electromechanical System Based Arc-Less Switching With Circuitry For Absorbing Electrical Energy During A Fault Condition	Dolby Intellectual Property Licensing, LLC	Expired
162711-IT-12	Italy	6/19/2007	7110553	IT1928005	9/25/2013	Micro-Electromechanical System Based Arc-Less Switching With Circuitry For Absorbing Electrical Energy During A Fault Condition	Dolby Intellectual Property Licensing, LLC	Expired
164314-US-2	United States of America	10/19/2005	11/254094	US2007/0231826		ASSEMBLY FOR MAGNETICALLY DIRECTED SELF-ASSEMBLY (As amended)	Dolby Intellectual Property Licensing, LLC	Expired
164415-FR-1	France	4/11/2005	503549	FR0503549	5/2/2008	Multiple Motion Compensated Noise Reduction Algorithm	Dolby Intellectual Property Licensing, LLC	Expired
164415-DE-2	Germany (Federal Republic of)	4/10/2006	1.02006E+11	DE102006017097A1		Multiple Motion Compensated Noise Reduction Algorithm	Dolby Intellectual Property Licensing, LLC	Expired
164415-JP-3	Japan	4/11/2006	2006-108845	JP5072253	8/31/2012	Multiple Motion Compensated Noise Reduction Algorithm	Dolby Intellectual Property Licensing, LLC	Expired
164415-FR-5	France	4/11/2006	603195	FR0603195	1/4/2008	Multiple Motion Compensated Noise Reduction Algorithm	Dolby Intellectual Property Licensing, LLC	Expired
164467-US-1	United States of America	11/18/2005	11/283459	US2007/0152238		HETEROSTRUCTURE FIELD EFFECT TRANSISTOR AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
176303-US-1	United States of America	1/9/2006	11/327954	US7489048	2/10/2009	ENERGY STORAGE SYSTEM FOR ELECTRIC OR HYBRID VEHICLE	Dolby Intellectual Property Licensing, LLC	Expired
176303-WO-2	Patent Cooperation Treaty	12/15/2006	US06/48133	WO2007/081495		ENERGY STORAGE SYSTEM FOR ELECTRIC OR HYBRID VEHICLE	Dolby Intellectual Property Licensing, LLC	Expired
176303-EP-4	European Patent	12/15/2006	6847706.6	EP1977495	11/24/2010	ENERGY STORAGE SYSTEM FOR ELECTRIC OR HYBRID VEHICLE	Dolby Intellectual Property Licensing, LLC	Expired
176303-JP-13	Japan	4/15/2014	2014-083265	JP2014-150718		ULTRACAPACITOR INTERFACE FOR DECOUPLING BATTERY FROM MOTOR TRACTION DRIVE	Dolby Intellectual Property Licensing, LLC	Expired
176918-US-1	United States of America	3/16/2005	60/662149			SINGLE-BIT MICRO-HOLOGRAMS AND A THRESHOLD MATERIAL	Dolby Intellectual Property Licensing, LLC	Expired
176918-WO-3	Patent Cooperation Treaty	3/15/2006	US06/09249			DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-US-6	United States of America	9/19/2006	60/845579			SINGLE-BIT MICRO-HOLOGRAMS AND A THRESHOLD MATERIAL	Dolby Intellectual Property Licensing, LLC	Expired
176918-TW-7	Taiwan	3/16/2006	95109026	TWNI327724	7/21/2010	SINGLE-BIT MICRO-HOLOGRAMS AND A THRESHOLD MATERIAL	Dolby Intellectual Property Licensing, LLC	Expired
176918-TW-8	Taiwan	9/19/2007	96134916	TWI438561	5/21/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-IN-9	India	3/15/2006	3523/KOLNP/2007	IN273227	7/14/2016	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-JP-10	Japan	3/15/2006	2008-501988	JP4847516	10/21/2011	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired

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176918-CA-11	Canada	3/15/2006	2783963	CA2783963	10/7/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-TH-12	Thailand	3/15/2006	601001199	TH39489	4/1/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-MY-13	Malaysia	3/15/2006	PI20061158	MY142083A	8/30/2010	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-EP-14	European Patent	3/15/2006	6738323.2	EP1869510	5/15/2013	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-IL-15	Israel	3/15/2006	185973	IL185973	5/28/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-NO-16	Norway	3/16/2006	20075284	NO338315	8/8/2016	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-RU-17	Russian Federation		2007138218	RU2459284	8/20/2012	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-SG-18	Singapore	3/15/2006	200708432-0	SG135654	3/31/2010	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-TH-19	Thailand	11/22/2007	701004721	TH97812		DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-WO-20	Patent Cooperation Treaty		PCT/US2007/020263			DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-CN-21	China	3/15/2006	2.0068E+11	CN200680017070.1	4/25/2012	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-BR-22	Brazil	3/15/2006	PI0608713-2			SINGLE-BIT MICRO-HOLOGRAMS AND A THRESHOLD MATERIAL	Dolby Intellectual Property Licensing, LLC	Expired
176918-KR-23	Korea, Republic of (KR)	3/15/2006	2007-7023588	KR10-1274645	6/7/2013	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-CA-24	Canada	9/19/2007	2663380	CA2663380	11/3/2015	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-EP-25	European Patent	3/11/2009	7838470.8	EP2064599	5/8/2013	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-JP-26	Japan	9/19/2007	2009-528346	JP5227322	3/22/2013	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-RU-27	Russian Federation	9/19/2007	2009114712	RU2437134	12/20/2011	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-MX-28	Mexico	3/15/2006	MX/a/2007/011497			SINGLE-BIT MICRO-HOLOGRAMS AND A THRESHOLD MATERIAL	Dolby Intellectual Property Licensing, LLC	Expired
176918-EP-29	European Patent	9/11/2012	12183883.3	EP2535777	1/8/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-EP-30	European Patent	9/11/2012	12183884.1	EP2535778	4/2/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-DE-31	Germany (Federal Republic of)	3/11/2009	7838470.8	DE2064599	5/8/2013	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-GB-32	United Kingdom	3/11/2009	7838470.8	GB2064599	5/8/2013	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-NL-33	Netherlands	3/11/2009	7838470.8	NL2064599	5/8/2013	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired

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176918-DE-34	Germany (Federal Republic of)	3/15/2006	6738323.2	DE1869510	5/15/2013	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-GB-35	United Kingdom	3/15/2006	6738323.2	GB1869510	5/15/2013	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-DE-36	Germany (Federal Republic of)	9/11/2012	12183883.3	DE2535777	1/8/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-FR-37	France	9/11/2012	12183883.3	FR2535777	1/8/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-GB-38	United Kingdom	9/11/2012	12183883.3	GB2535777	1/8/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-GB-39	United Kingdom	9/11/2012	12183884.1	GB2535778	4/2/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
176918-FR-40	France	9/11/2012	12183884.1	FR2535778	4/2/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
183176-US-1	United States of America	12/19/2006	11/640994	US8483240	7/9/2013	PIGGYBACK NETWORKS	Dolby Intellectual Property Licensing, LLC	Expired
183176-WO-2	Patent Cooperation Treaty	12/19/2007	PCT/US07/025825	WO2008082514		PIGGYBACK NETWORKS	Dolby Intellectual Property Licensing, LLC	Expired
183176-CA-3	Canada	12/19/2007	2672394	CA2672394	2/2/2016	PIGGYBACK NETWORKS	Dolby Intellectual Property Licensing, LLC	Expired
183176-JP-5	Japan	12/19/2007	2009-542874	JP5394253	10/25/2013	PIGGYBACK NETWORKS	Dolby Intellectual Property Licensing, LLC	Expired
183176-KR-6	Korea, Republic of (KR)	12/19/2007	1.0201E+12	KR10-1441431	9/11/2014	PIGGYBACK NETWORKS US CASE IS OWNED BY LOCKHEED	Dolby Intellectual Property Licensing, LLC	Expired
183752-EP-2	European Patent	11/7/2006	6123605.5	EP1785938		METHOD AND SYSTEM FOR GENERATING POLYGONAL BOUNDARY DEFINITIONS FOR IMAGE OBJECTS	Dolby Intellectual Property Licensing, LLC	Expired
183752-JP-3	Japan	11/7/2006	2006-301296	JP4977448	4/20/2012	METHOD AND SYSTEM FOR GENERATING POLYGONAL BOUNDARY DEFINITIONS FOR IMAGE OBJECTS	Dolby Intellectual Property Licensing, LLC	Expired
187674-US-1	United States of America	5/25/2007	60/940313			Method and Apparatus for Assembling Photovoltaic Modules	Dolby Intellectual Property Licensing, LLC	Expired
187674-EP-5	European Patent	5/21/2008	8156634.1	EP1995791	7/22/2015	METHOD AND APPARATUS FOR ASSEMBLING PHOTOVOLTAIC MODULES	Dolby Intellectual Property Licensing, LLC	Expired
189292-WO-2	Patent Cooperation Treaty	1/5/2007	US07/00399	WO 2007/081875		VEHICLE PROPULSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
189292-IN-5	India	1/5/2007	5471/DELNP/2008	IN300171	8/23/2018	VEHICLE PROPULSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
195378-US-1	United States of America	6/21/2006	11/425603	US2007/0297964		COMPOSITIONS COMPRISING MAGNESIUM BOROHYDRIDE AND MAGNESIUM HYDRIDOBOROHYDRIDE AND METHOD FOR MANUFACTURING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired

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197732-US-1	United States of America	1/18/2006	60/759991			ELECTRIC DRIVE ENERGY MANAGEMENT SYSTEM CONTROL WITH MULTIPLE ENERGY STORAGE UNITS	Dolby Intellectual Property Licensing, LLC	Expired
197732-AU-3	Australia	1/18/2007	2007200207			VEHICLE PROPULSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
197732-EP-6	European Patent	1/18/2007	7100757.9	EP1810861	8/11/2010	VEHICLE PROPULSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
197732-KR-9	Korea, Republic of (KR)	1/18/2007	2007-0005792			VEHICLE PROPULSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
197732-MX-10	Mexico	1/18/2007	MX/A/2007/000823			VEHICLE PROPULSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
198520-US-2	United States of America	10/6/2006	11/539340			COMPOSITION AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
205374-EP-3	European Patent	11/26/2007	7121542	EP1928006	1/20/2010	MICRO-ELECTROMECHANICAL SYSTEM BASED SWITCHING MODULE SERIALLY STACKABLE WITH OTHER SUCH MODULES TO MEET A VOLTAGE RATING	Dolby Intellectual Property Licensing, LLC	Expired
205374-IT-10	Italy	11/26/2007	7121542	IT1928006	1/20/2010	MICRO-ELECTROMECHANICAL SYSTEM BASED SWITCHING MODULE SERIALLY STACKABLE WITH OTHER SUCH MODULES TO MEET A VOLTAGE RATING	Dolby Intellectual Property Licensing, LLC	Expired
205979-US-1	United States of America	5/16/2007	11/749316	US20080288132A1		METHOD OF OPERATING VEHICLE AND ASSOCIATED SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
205979-CN-3	China	8/7/2008	2.0081E+11	CN101643037		METHOD OF OPERATING VEHICLE AND ASSOCIATED SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
205979-EP-4	European Patent	8/5/2008	8161865.4	EP2151362	10/10/2012	METHOD OF OPERATING VEHICLE AND ASSOCIATED SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
205979-JP-5	Japan	8/5/2008	2008-201398			METHOD OF OPERATING VEHICLE AND ASSOCIATED SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
205979-KR-6	Korea, Republic of (KR)	8/18/2008	1.02008E+12	KR1020100021753A		METHOD OF OPERATING VEHICLE AND ASSOCIATED SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
205979-EP-7	European Patent	7/3/2012	12174839.6	EP2583874		METHOD OF OPERATING VEHICLE AND ASSOCIATED SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
207792-CA-8	Canada	9/18/2008	2639584			System with circuitry for suppressing arc formation in micro-electromechanical system based switch�?	Dolby Intellectual Property Licensing, LLC	Expired
207792-CN-9	China	10/6/2008	2.0081E+11	CN101404220A		SYSTEM WITH CIRCUITRY FOR SUPPRESSING ARC FORMATION IN MICRO-ELECTROMECHANICAL SYSTEM BASED SWITCH	Dolby Intellectual Property Licensing, LLC	Expired
207792-EP-10	European Patent	9/16/2008	8164432	EP2045823	8/16/2017	System with circuitry for suppressing arc formation in micro-electromechanical system based switch	Dolby Intellectual Property Licensing, LLC	Expired
208273-CN-2	China	12/23/2009	2.0091E+11	CN200910261931.6	9/3/2014	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
208273-EP-3	European Patent	12/8/2009	9178261.5	EP2202734		DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
208273-JP-4	Japan	12/22/2009	2009-289979	JP5749885	5/22/2015	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
208273-KR-5	Korea, Republic of (KR)	12/23/2009	1.02009E+12	KR10-1593232	2/2/2016	DATA STORAGE DEVICES AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
215038-CN-2	China	12/6/2007	2.0071E+11	CN200710196923.9	6/20/2012	ELECTROMECHANICAL SWITCHING CIRCUITRY IN PARALLEL WITH SOLID STATE SWITCHING CIRCUITRY	Dolby Intellectual Property Licensing, LLC	Expired
215038-EP-3	European Patent	11/26/2007	7121476.1	EP1930922	8/9/2017	Electromechanical Switching Circuitry In Parallel With Solid State Switching Circuitry Selectively Switchable To Carry A Load Current Appropriate To Such Circuitry	Dolby Intellectual Property Licensing, LLC	Expired
215575-CN-2	China	1/11/2008	2.0081E+11	CN200810002899.5	12/26/2012	GATING VOLTAGE CONTROL SYSTEM AND METHOD FOR ELECTROSTATICALLY ACTUATING A MICRO-ELECTROMECHANICAL DEVICE	Dolby Intellectual Property Licensing, LLC	Expired
215575-MX-6	Mexico	1/10/2008	2008/000525	MX276522	6/10/2010	GATING VOLTAGE CONTROL SYSTEM AND METHOD FOR ELECTROSTATICALLY ACTUATING A MICRO-ELECTROMECHANICAL DEVICE	Dolby Intellectual Property Licensing, LLC	Expired
216634-WO-2	Patent Cooperation Treaty	2/13/2008	PCT/US2008/001862	WO2008100517		RED LINE EMITTING PHOSPHORS FOR USE IN LED APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Expired
216634-EP-6	European Patent	2/13/2008	8725487.6			NEW RED LINE EMITTING PHOSPHORS FOR USE IN LED APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Expired
216634-KR-11	Korea, Republic of (KR)	2/13/2008	1.02018E+12	KR10-2017-0048603		NEW RED LINE EMITTING PHOSPHORS FOR USE IN LED APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Expired
219867-US-1	United States of America	9/9/2008	61/095380			COMPOSITION, ENERGY STORAGE DEVICE, AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219867-US-3	United States of America	12/9/2008	12/330735			METHOD OF MAKING AND USING COMPOSITION AND ENERGY STORAGE DEVICE	Dolby Intellectual Property Licensing, LLC	Expired
219867-US-4	United States of America	12/9/2008	12/330752			ENERGY STORAGE DEVICE AND SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
219867-WO-5	Patent Cooperation Treaty	8/27/2009	US09/55136	WO2010/030510		ENERGY STORAGE DEVICE AND SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
219867-AU-6	Australia	8/27/2009	2009251226			ENERGY STORAGE DEVICE AND SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
219867-BR-7	Brazil	8/27/2009	PI0905373-5			ENERGY STORAGE DEVICE AND SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
219867-EP-9	European Patent	8/27/2009	9791978.1	EP2335308		ENERGY STORAGE DEVICE AND SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
219867-IN-10	India	8/27/2009	1355/DELNP/2011	IN1355DELNP2011		ENERGY STORAGE DEVICE AND SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
219867-JP-11	Japan	8/27/2009	2011-526114	JP2012502430		ENERGY STORAGE DEVICE AND SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired

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219867-RU-12	Russian Federation	8/27/2009	2011108407			ENERGY STORAGE DEVICE AND SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
219867-CN-14	China	8/27/2009	2.0131E+11	CN103219500A		COMPOSITION ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219868-US-1	United States of America	12/19/2006	60/870843			ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219868-US-2	United States of America	6/15/2007	11/763787			COPPER-BASED ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219868-WO-4	Patent Cooperation Treaty	11/20/2007	US07/85243	WO2008079563		COPPER-BASED ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219868-US-5	United States of America	5/28/2009	12/473353			ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219868-US-6	United States of America	5/28/2009	12/473361			ENERGY STORAGE DEVICE AND SYSTEM (AS AMENDED JULY 30, 2012)	Dolby Intellectual Property Licensing, LLC	Expired
219868-AU-7	Australia	11/20/2007	2007338533	AU2007338533	8/16/2012	ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219868-CH-8	Switzerland	11/20/2007	00925/09	CH698359	5/31/2012	ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219868-CN-9	China	11/20/2007	2.0078E+11	CN101563797A		COPPER-BASED ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219868-JP-10	Japan	11/20/2007	2009-543005	JP2010514142		ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219868-CH-11	Switzerland		2072/10	CH704630	9/28/2012	ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219868-CN-12	China	11/20/2007	2.0111E+11			ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
219869-WO-2	Patent Cooperation Treaty	5/7/2008	US08/62843			ENERGY STORAGE DEVICE AND CELL CONFIGURATION THEREFOR	Dolby Intellectual Property Licensing, LLC	Expired
220217-WO-2	Patent Cooperation Treaty	3/17/2008	US08/57192	WO2008/137215		SYSTEM AND METHOD FOR COOLING A BATTERY	Dolby Intellectual Property Licensing, LLC	Expired
220217-CN-3	China	3/17/2008	2.0088E+11	CN200880014904.2	11/13/2013	SYSTEM AND METHOD FOR COOLING A BATTERY	Dolby Intellectual Property Licensing, LLC	Expired
220217-EP-4	European Patent	3/17/2008	8743951.9	EP2155513		SYSTEM AND METHOD FOR COOLING A BATTERY	Dolby Intellectual Property Licensing, LLC	Expired
220217-JP-5	Japan	3/17/2008	2010-507492	JP5271351	5/17/2013	SYSTEM AND METHOD FOR COOLING A BATTERY	Dolby Intellectual Property Licensing, LLC	Expired
220219-WO-2	Patent Cooperation Treaty	3/17/2008	US08/57188			SYSTEM AND METHOD FOR COOLING A BATTERY	Dolby Intellectual Property Licensing, LLC	Expired
220219-EP-4	European Patent	3/17/2008	8732331.7	EP2147475	11/29/2017	SYSTEM FOR COOLING A BATTERY	Dolby Intellectual Property Licensing, LLC	Expired
220778-CA-2	Canada	12/11/2008	2647126			MEMS SWITCH WITH IMPROVED STANDOFF VOLTAGE CONTROL	Dolby Intellectual Property Licensing, LLC	Expired

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220778-EP-4	European Patent	12/12/2008	8171425.5	EP2073238	11/1/2017	MEMS SWITCH WITH IMPROVED STANDOFF VOLTAGE CONTROL	Dolby Intellectual Property Licensing, LLC	Expired
220787-CA-2	Canada	12/4/2008	2645834			MEMS MICROSWITCH HAVING A CONDUCTIVE MECHANICAL STOP	Dolby Intellectual Property Licensing, LLC	Expired
220787-EP-4	European Patent	12/11/2008	8171380.2	EP2073236	3/2/2011	MEMS MICROSWITCH HAVING A CONDUCTIVE MECHANICAL STOP	Dolby Intellectual Property Licensing, LLC	Expired
220787-DE-8	Germany (Federal Republic of)	12/11/2008	6.02008E+11	DE2073236	3/2/2011	MEMS MICROSWITCH HAVING A CONDUCTIVE MECHANICAL STOP	Dolby Intellectual Property Licensing, LLC	Expired
220787-GB-9	United Kingdom	12/11/2008	8171380.2	GB2073236	3/2/2011	MEMS MICROSWITCH HAVING A CONDUCTIVE MECHANICAL STOP	Dolby Intellectual Property Licensing, LLC	Expired
220822-CA-2	Canada	10/16/2008	2641190			SYSTEM AND METHOD FOR AVOIDING CONTACT STICTION IN MICROELECTROMECHANICAL SYSTEM BASED SWITCH	Dolby Intellectual Property Licensing, LLC	Expired
220822-CN-3	China	10/31/2008	2.0081E+11	CN200810173971.0	11/27/2013	SYSTEM AND METHOD FOR AVOIDING CONTACT STICTION IN MICROELECTROMECHANICAL SYSTEM BASED SWITCH	Dolby Intellectual Property Licensing, LLC	Expired
220822-EP-4	European Patent	10/24/2008	8167469.9	EP2056325	9/7/2011	SYSTEM AND METHOD FOR AVOIDING CONTACT STICTION IN MICROELECTROMECHANICAL SYSTEM BASED SWITCH	Dolby Intellectual Property Licensing, LLC	Expired
220822-FR-7	France	10/24/2008	8167469.9	FR2056325	9/7/2011	SYSTEM AND METHOD FOR AVOIDING CONTACT STICTION IN MICROELECTROMECHANICAL SYSTEM BASED SWITCH	Dolby Intellectual Property Licensing, LLC	Expired
220822-DE-8	Germany (Federal Republic of)	10/24/2008	8167469.9	DE200800950 2.9	9/7/2011	SYSTEM AND METHOD FOR AVOIDING CONTACT STICTION IN MICROELECTROMECHANICAL SYSTEM BASED SWITCH	Dolby Intellectual Property Licensing, LLC	Expired
220822-GB-9	United Kingdom	10/24/2008	8167469.9	GB2056325	9/7/2011	SYSTEM AND METHOD FOR AVOIDING CONTACT STICTION IN MICROELECTROMECHANICAL SYSTEM BASED SWITCH	Dolby Intellectual Property Licensing, LLC	Expired
220822-IT-10	Italy	10/24/2008	8167469.9	IT2056325	9/7/2011	SYSTEM AND METHOD FOR AVOIDING CONTACT STICTION IN MICROELECTROMECHANICAL SYSTEM BASED SWITCH	Dolby Intellectual Property Licensing, LLC	Expired
220832-CA-2	Canada	10/9/2008	2640827			SEALED WAFER PACKAGING OF MICROELECTROMECHANICAL SYSTEMS	Dolby Intellectual Property Licensing, LLC	Expired
220832-JP-5	Japan	10/10/2008	2008-263310			SEALED WAFER PACKAGING OF MICROELECTROMECHANICAL SYSTEMS	Dolby Intellectual Property Licensing, LLC	Expired
220832-KR-6	Korea, Republic of (KR)	10/15/2008	2008-0100976			SEALED WAFER PACKAGING OF MICROELECTROMECHANICAL SYSTEMS	Dolby Intellectual Property Licensing, LLC	Expired
220832-MX-7	Mexico	10/14/2008	MX/a/2008/013274			SEALED WAFER PACKAGING OF MICROELECTROMECHANICAL SYSTEMS	Dolby Intellectual Property Licensing, LLC	Expired

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220887-WO-2	Patent Cooperation Treaty	6/20/2007	US07/71644			A MEMS Microswitch Bypass and Protection System for Variable Frequency HVAC Drives	Dolby Intellectual Property Licensing, LLC	Expired
220887-EP-4	European Patent	6/20/2007	7798805.3	EP2171363	8/12/2015	MICRO-ELECTROMECHANICAL SYSTEM BASED SWITCHING IN HEATING-VENTILATION-AIR-CONDITIONING SYSTEMS	Dolby Intellectual Property Licensing, LLC	Expired
221845-WO-2	Patent Cooperation Treaty	6/20/2007	US07/71624			Arcless MEMS Microswitch DC Interrupter	Dolby Intellectual Property Licensing, LLC	Expired
221845-EP-4	European Patent	6/15/2007	7798799.8	EP2162897	2/27/2013	MICRO-ELECTROMECHANICAL SYSTEM BASED SWITCHING	Dolby Intellectual Property Licensing, LLC	Expired
221845-KR-6	Korea, Republic of (KR)	12/15/2009	2009-7026190	KRWO08/153574		MICRO-ELECTROMECHANICAL SYSTEM BASED SWITCHING	Dolby Intellectual Property Licensing, LLC	Expired
222841-US-1	United States of America	6/22/2007	60/945715			PROCESS FOR PREPARATION OF METAL OXIDES	Dolby Intellectual Property Licensing, LLC	Expired
222841-IN-6	India	10/31/2008	2472/DEL/2008			METAL OXIDE COATINGS	Dolby Intellectual Property Licensing, LLC	Expired
224610-WO-2	Patent Cooperation Treaty	6/20/2007	PCT/US07/014363	WO2008156449		RESETTABLE MEMS MICRO-SWITCH ARRAY BASED ON CURRENT LIMITING APPARATUS	Dolby Intellectual Property Licensing, LLC	Expired
224610-EP-4	European Patent	6/20/2007	7796290	EP2162891	8/12/2015	RESETTABLE MEMS MICRO-SWITCH ARRAY BASED ON CURRENT LIMITING APPARATUS	Dolby Intellectual Property Licensing, LLC	Expired
224610-JP-5	Japan	6/20/2007	2010-513168	JP5002708	5/25/2012	RESETTABLE MEMS MICRO-SWITCH ARRAY BASED ON CURRENT LIMITING APPARATUS	Dolby Intellectual Property Licensing, LLC	Expired
224631-WO-2	Patent Cooperation Treaty	6/20/2007	US07/14379	WO2008/153530		REMOTE-OPERABLE MICRO-ELECTROMECHANICAL SYSTEM BASED OVER-CURRENT PROTECTION APPARATUS	Dolby Intellectual Property Licensing, LLC	Expired
224631-EP-4	European Patent	6/20/2007	7835836.3	EP2162964	3/21/2018	REMOTE-OPERABLE MICRO-ELECTROMECHANICAL SYSTEM BASED OVER-CURRENT PROTECTION APPARATUS	Dolby Intellectual Property Licensing, LLC	Expired
224631-KR-6	Korea, Republic of (KR)	6/20/2007	1.0201E+12	KR102010021481A		REMOTE-OPERABLE MICRO-ELECTROMECHANICAL SYSTEM BASED OVER-CURRENT PROTECTION APPARATUS	Dolby Intellectual Property Licensing, LLC	Expired
225009-WO-4	Patent Cooperation Treaty	4/10/2008	US08/59839			PROPULSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
225009-WO-5	Patent Cooperation Treaty	4/10/2008	US08/59840	WO2008/137247		METHOD OF OPERATING PROPULSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
225009-WO-6	Patent Cooperation Treaty	4/10/2008	US08/59843	WO2008/137248		ELECTRIC DRIVE VEHICLE RETROFIT SYSTEM AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225009-AU-12	Australia	4/10/2008	2008247962			METHOD OF OPERATING PROPULSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired

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225009-JP-15	Japan	4/10/2008	2010-507499	JP2010527222		METHOD OF OPERATING PROPULSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
225009-EP-19	European Patent	4/10/2008	8745450	EP2146864		ELECTRIC DRIVE VEHICLE RETROFIT SYSTEM AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225009-JP-20	Japan	4/10/2008	2010-507500	JPWO08/1372248		ELECTRIC DRIVE VEHICLE RETROFIT SYSTEM AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225009-EP-32	European Patent	4/10/2008	19199165.2	EP3640066		ELECTRIC DRIVE VEHICLE RETROFIT SYSTEM AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225349-CN-2	China	9/30/2009	2.0091E+11	CN101714668A		ENERGY STORAGE DEVICE AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225349-EP-3	European Patent	10/2/2009	9172049	EP2178150	6/20/2012	ENERGY STORAGE DEVICE AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225349-JP-4	Japan	10/6/2009	2009-232063	JP2010092856		ENERGY STORAGE DEVICE AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225349-FI-5	Finland	10/2/2009	9172049	FI2178150	6/20/2012	ENERGY STORAGE DEVICE AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225349-FR-6	France	10/2/2009	9172049	FR2178150	6/20/2012	ENERGY STORAGE DEVICE AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225349-DE-7	Germany (Federal Republic of)	10/2/2009	9172049	DE2178150	6/20/2012	ENERGY STORAGE DEVICE AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225349-GB-8	United Kingdom	10/2/2009	9172049	GB2178150	6/20/2012	ENERGY STORAGE DEVICE AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225349-IT-9	Italy	10/2/2009	9172049	IT2178150	6/20/2012	ENERGY STORAGE DEVICE AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225349-ES-10	Spain	10/2/2009	9172049	ES2178150	6/20/2012	ENERGY STORAGE DEVICE AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225349-SE-11	Sweden	10/2/2009	9172049	SE2178150	6/20/2012	ENERGY STORAGE DEVICE AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225349-CH-12	Switzerland	10/2/2009	9172049	CH2178150	6/20/2012	ENERGY STORAGE DEVICE AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225533-WO-2	Patent Cooperation Treaty	7/14/2009	US09/50438	WO2010021792		SEAL RING AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225533-AU-3	Australia	7/14/2009	2009283103			SEAL RING AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
225533-EP-5	European Patent	7/14/2009	9790350.4	EP2327118	4/22/2015	SEAL RING AND ASSOCIATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
226798-EP-3	European Patent	11/7/2008	8168549.7	EP2065770	1/9/2013	PROGRAMMABLE LOGIC CONTROLLER HAVING	Dolby Intellectual Property Licensing, LLC	Expired
226798-DE-7	Germany (Federal	11/7/2008	8168549.7	DE602008021499.0	1/9/2013	PROGRAMMABLE LOGIC CONTROLLER HAVING	Dolby Intellectual Property Licensing, LLC	Expired
226798-GB-9	United Kingdom	11/7/2008	8168549.7	GB2065770	1/9/2013	PROGRAMMABLE LOGIC CONTROLLER HAVING	Dolby Intellectual Property Licensing, LLC	Expired
226798-IT-10	Italy	11/7/2008	8168549.7	IT2065770	1/9/2013	PROGRAMMABLE LOGIC CONTROLLER HAVING	Dolby Intellectual Property Licensing, LLC	Expired

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226893-DE-1	Germany (Federal Republic of)	10/11/2007	2007049036	DE 20070490 35	1/13/2011	THERMAL CONDUCTION WITH THE AID OF A WEDGE TO COMPENSATE TOLERANCES	Dolby Intellectual Property Licensing, LLC	Expired
226893-WO-2	Patent Cooperation Treaty	10/10/2008	PCT/EP2008/0 63683	WO 2009/050130		THERMAL CONDUCTION WITH THE AID OF A WEDGE TO COMPENSATE TOLERANCES	Dolby Intellectual Property Licensing, LLC	Expired
227091-WO-2	Patent Cooperation Treaty	4/21/2009	PCT/US09/04 1184	WO 2009142 860		COMPOSITE ARTICLE AND RELATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227091-EP-4	European Patent	4/21/2009	9736780.9	EP2307332		COMPOSITE ARTICLE AND RELATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227568-US-1	United States of America	7/16/2007	60/949960			RED LINE EMITTING COMPLEX FLUORIDE PHOSPHORS ACTIVATED WITH Mn4+	Dolby Intellectual Property Licensing, LLC	Expired
227731-WO-2	Patent Cooperation Treaty	11/14/2008	US08/83584	WO09/08267		ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227731-AU-3	Australia	11/14/2008	2008340403			ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227731-EP-5	European Patent		8863617	EP2227837	9/5/2012	ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227731-JP-6	Japan	11/14/2008	2010-539564	JP 20115083 79		ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227731-ZA-7	South Africa	11/14/2008	2009/07832	ZA2009/078 32	2/23/2011	ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227731-CH-8	Switzerland		8863617	CH2227837	9/5/2012	ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227731-DE-9	Germany (Federal Republic of)		8863617	DE 20080186 26.1	9/5/2012	ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227731-GB-10	United Kingdom		8863617	GB2227837	9/5/2012	ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227731-IT-11	Italy		8863617	IT2227837	9/5/2012	ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227731-FR-12	France		8863617	FR2227837	9/5/2012	ENERGY STORAGE DEVICE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
227889-EP-3	European Patent	10/24/2008	8167480.6	EP2056315	7/23/2014	MICRO-ELECTROMECHANICAL SYSTEM BASED SWITCHING	Dolby Intellectual Property Licensing, LLC	Expired
228276-EP-2	European Patent	7/30/2009	9166837.6	EP2154730		SOLAR CELL INCLUDING COOLING CHANNELS AND METHOD FOR FABRICATION	Dolby Intellectual Property Licensing, LLC	Expired
228276-JP-3	Japan	7/29/2009	2009-175958	JP 20100453 48		SOLAR CELL INCLUDING COOLING CHANNELS AND METHOD FOR FABRICATION	Dolby Intellectual Property Licensing, LLC	Expired
228365-WO-2	Patent Cooperation Treaty	12/16/2009	US09/068341	WO2010/780 00		DISC STRUCTURE FOR BIT-WISE HOLOGRAPHIC STORAGE	Dolby Intellectual Property Licensing, LLC	Expired

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228365-US-3	United States of America	12/13/2010	12/966144	US0080823		DISC STRUCTURE FOR BIT-WISE HOLOGRAPHIC STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
228365-CA-4	Canada	12/16/2009	2747440			DISC STRUCTURE FOR BIT-WISE HOLOGRAPHIC STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
228365-CN-5	China	12/16/2009	2.0098E+11	CN20098015 3821.6	11/12/2014	DISK STRUCTURE FOR BIT TYPE HOLOGRAPHIC STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
228365-EP-6	European Patent	12/16/2009	9799452.9	EP2384511		DISC STRUCTURE FOR BIT-WISE HOLOGRAPHIC STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
228365-IN-7	India	6/13/2011	4477/DELNP/ 2011	IN4477DEL NP2011		DISC STRUCTURE FOR BIT-WISE HOLOGRAPHIC STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
228365-JP-8	Japan	12/16/2009	2011-543581	JP20125142 85		DISC STRUCTURE FOR BIT-WISE HOLOGRAPHIC STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
228365-KR-9	Korea, Republic of (KR)	12/16/2009	1.02012E+12	KR10- 1646297	8/1/2016	DISC STRUCTURE FOR BIT-WISE HOLOGRAPHIC STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
228583-EP-5	European Patent	9/4/2009	9169531.2	EP2164089	4/12/2017	MICRO-ELECTROMECHANICAL SWITCH PROTECTION IN SERIES PARALLEL TOPOLOGY	Dolby Intellectual Property Licensing, LLC	Expired
229967-CA-2	Canada	12/10/2009	2688117			MICRO-ELECTROMECHANICAL SYSTEM SWITCH	Dolby Intellectual Property Licensing, LLC	Expired
229968-EP-4	European Patent	12/11/2008	8171381	EP2073237	10/19/2016	MEMS MICROSWITCH HAVING A DUAL ACTUATOR AND SHARED GATE	Dolby Intellectual Property Licensing, LLC	Expired
230521-GB-1	United Kingdom	1/25/2007	701370.9	GB2445972	12/29/2010	CATHODE FOR AN ELECTROCHEMICAL CELL	Dolby Intellectual Property Licensing, LLC	Expired
230521-WO-2	Patent Cooperation Treaty	1/23/2008	GB08/000239	WO 2008/090344		CATHODE FOR AN ELECTROCHEMICAL CELL	Dolby Intellectual Property Licensing, LLC	Expired
230537-US-1	United States of America	8/28/2009	12/549877	US20110052 968A1		BATTERY PACK ASSEMBLY AND RELATED PROCESSES	Dolby Intellectual Property Licensing, LLC	Expired
230537-WO-2	Patent Cooperation Treaty	7/13/2010	US10/41766	WO2011/025 594		BATTERY PACK ASSEMBLY AND RELATED PROCESSES	Dolby Intellectual Property Licensing, LLC	Expired
230537-EP-4	European Patent	7/13/2010	10732610	EP2471124		BATTERY PACK ASSEMBLY AND RELATED PROCESSES	Dolby Intellectual Property Licensing, LLC	Expired
232258-EP-4	European Patent	4/25/2012	12165462.8	EP2518745		Switching Array Having Circuitry to Adjust a Temporal Distribution of a Gating Signal Applied to the Array	Dolby Intellectual Property Licensing, LLC	Expired
232258-JP-5	Japan	4/25/2012	2012-099356	JP20122385 86		Switching Array Having Circuitry to Adjust a Temporal Distribution of a Gating Signal Applied to the Array	Dolby Intellectual Property Licensing, LLC	Expired
232260-WO-2	Patent Cooperation Treaty	3/2/2010	US10/25851	WO 2010/126648		CATHODE COMPOSITION AND ELECTROCHEMICAL CELL COMPRISING SAME	Dolby Intellectual Property Licensing, LLC	Expired
232652-WO-2	Patent Cooperation Treaty	7/2/2009	US09/49537	WO2010/011 484		METHOD AND SYSTEM FOR CONTROL OF A VEHICLE ENERGY STORAGE DEVICE	Dolby Intellectual Property Licensing, LLC	Expired

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232652-JP-6	Japan	1/24/2011	2011-520074			METHOD AND SYSTEM FOR CONTROL OF A VEHICLE ENERGY STORAGE DEVICE	Dolby Intellectual Property Licensing, LLC	Expired
232737-JP-4	Japan	12/1/2009	2009-273096	JP2010136614		AUXILIARY DRIVE APPARATUS AND METHOD OF MANUFACTURING SAME	Dolby Intellectual Property Licensing, LLC	Expired
232802-EP-3	European Patent	1/18/2010	10150930.5	EP2213502		MODULAR AUXILIARY POWER UNIT ASSEMBLY FOR AN ELECTRIC VEHICLE	Dolby Intellectual Property Licensing, LLC	Expired
232802-JP-4	Japan	1/20/2010	2010-009602	JP2010173630		MODULAR AUXILIARY POWER UNIT ASSEMBLY FOR AN ELECTRIC VEHICLE	Dolby Intellectual Property Licensing, LLC	Expired
233619-EP-2	European Patent	3/23/2010	10157266.7	EP2236370	5/16/2018	APPARATUS AND METHOD FOR ADVANCED ANTI-SKID BRAKE AND TRACTION CONTROLS	Dolby Intellectual Property Licensing, LLC	Expired
233635-US-2	United States of America	1/27/2010	12/694820	US2010/0310456		IMAGING OF MYELIN BASIC PROTEIN	Dolby Intellectual Property Licensing, LLC	Expired
233635-WO-3	Patent Cooperation Treaty	6/3/2010	US10/37237	WO 2010/141704		IMAGING OF MYELIN BASIC PROTEIN	Dolby Intellectual Property Licensing, LLC	Expired
233635-EP-8	European Patent	6/3/2010	10728034.9	EP2437792	10/21/2015	AGENTS AND METHODS FOR THE IMAGING OF MYELIN BASIC PROTEIN	Dolby Intellectual Property Licensing, LLC	Expired
234422-EP-3	European Patent	8/2/2010	10171544.9	EP2315227		SWITCH STRUCTURES	Dolby Intellectual Property Licensing, LLC	Expired
234422-JP-4	Japan	8/9/2010	2010-178239	JP2011040385		SWITCH STRUCTURES	Dolby Intellectual Property Licensing, LLC	Expired
234422-EP-6	European Patent		19164314.7			SWITCH STRUCTURES	Dolby Intellectual Property Licensing, LLC	Expired
234577-JP-3	Japan	2/16/2010	2010-030787	JP2010188994		ELECTRICALLY DRIVEN POWER TAKE-OFF SYSTEM AND METHOD OF MANUFACTURING SAME	Dolby Intellectual Property Licensing, LLC	Expired
234828-US-2	United States of America	6/2/2020	16/889,902			SYSTEM AND METHOD FOR VEHICLE TEMPERATURE CONTROL	Dolby Intellectual Property Licensing, LLC	Expired
235141-US-1	United States of America	3/17/2009	12/405861	US20100240491A1		SYSTEM FOR VEHICLE PROPULSION HAVING AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
235141-EP-4	European Patent	3/15/2010	10156536.4	EP2230145		SYSTEM FOR VEHICLE PROPULSION HAVING AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
235141-IN-5	India	3/3/2010	462/DEL/2010			SYSTEM FOR VEHICLE PROPULSION HAVING AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
235141-JP-7	Japan	3/1/2016	2016-038524			SYSTEM FOR VEHICLE PROPULSION HAVING AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
235150-EP-5	European Patent	10/14/2009	9173009.3	EP2179882		APPARATUS FOR ENERGY TRANSFER USING CONVERTER AND METHOD OF MANUFACTURING SAME	Dolby Intellectual Property Licensing, LLC	Expired
235152-KR-7	Korea, Republic of (KR)	8/24/2016	1.02016E+12			Method and Apparatus for Energy Transfer using DC-DC Power Electronics and Machine Inductance	Dolby Intellectual Property Licensing, LLC	Expired
235655-EP-2	European Patent	9/22/2010	10178461.9	EP2306580	5/20/2015	COMPOSITION AND ENERGY STORAGE DEVICE	Dolby Intellectual Property Licensing, LLC	Expired

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235714-WO-2	Patent Cooperation Treaty		US10/48750	WO2011/056297		CATHODE COMPOSITIONS COMPRISING ZN AND CHALCOGENIDE AND ENERGY STORAGE CELL COMPRISING SAME	Dolby Intellectual Property Licensing, LLC	Expired
235783-AU-2	Australia	7/22/2010	2010203140			PROTECTIVE COATING COMPOSITIONS AND DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
235783-EP-4	European Patent	7/20/2010	10170065.6	EP2302006	11/28/2012	PROTECTIVE COATING COMPOSITIONS AND DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
236159-US-2	United States of America	2/25/2010	12/712457	US0206984		PRESEALED ANODE TUBE	Dolby Intellectual Property Licensing, LLC	Expired
236639-CN-2	China	8/31/2010	2.0101E+11	CN102005222B	7/23/2014	COMPOSITIONS, OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE OPTICAL DATA STORAGE MEDIA	Dolby Intellectual Property Licensing, LLC	Expired
236639-EP-3	European Patent	8/19/2010	10173473.9	EP2290408	8/15/2012	COMPOSITIONS, OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE OPTICAL DATA STORAGE MEDIA	Dolby Intellectual Property Licensing, LLC	Expired
236639-JP-4	Japan	8/20/2010	2010-184512	JP5738554	5/1/2015	COMPOSITIONS, OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE OPTICAL DATA STORAGE MEDIA	Dolby Intellectual Property Licensing, LLC	Expired
236639-KR-5	Korea, Republic of (KR)	8/30/2010	1.0201E+12	KR102011023822A		COMPOSITIONS, OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE OPTICAL DATA STORAGE MEDIA	Dolby Intellectual Property Licensing, LLC	Expired
236639-TW-6	Taiwan	8/30/2010	99129150	TWI500025	9/11/2015	COMPOSITIONS, OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE OPTICAL DATA STORAGE MEDIA	Dolby Intellectual Property Licensing, LLC	Expired
236639-DE-8	Germany (Federal Republic of)	8/19/2010	10173473.9	DE2290408	8/15/2012	COMPOSITIONS, OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE OPTICAL DATA STORAGE MEDIA	Dolby Intellectual Property Licensing, LLC	Expired
236639-GB-9	United Kingdom	8/19/2010	10173473.9	GB2290408	8/15/2012	COMPOSITIONS, OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE OPTICAL DATA STORAGE MEDIA	Dolby Intellectual Property Licensing, LLC	Expired
236639-NL-10	Netherlands	8/19/2010	10173473.9	NL2290408	8/15/2012	COMPOSITIONS, OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE OPTICAL DATA STORAGE MEDIA	Dolby Intellectual Property Licensing, LLC	Expired
236909-EP-3	European Patent	7/6/2010	10168517	EP2273520		TRANSFORMER ON-LOAD TAP CHANGER USING MEMS TECHNOLOGY	Dolby Intellectual Property Licensing, LLC	Expired
237446-US-1	United States of America	9/16/2009	61/242819			METHOD AND SYSTEM FOR CONTACTLESS FINGERPRINT DETECTION AND VERIFICATION	Dolby Intellectual Property Licensing, LLC	Expired
237714-EP-4	European Patent	3/28/2011	11160074.8	EP2434614	6/19/2013	CONTROL DISTRIBUTION TRANSFORMER AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
237735-WO-2	Patent Cooperation Treaty	6/18/2010	US10/39122	WO2011/025574		ELECTROCHEMICAL CELL	Dolby Intellectual Property Licensing, LLC	Expired
237851-EP-3	European Patent	3/28/2011	11160077.1	EP2371646	11/29/2017	APPARATUS FOR HYBRID DRIVE TORQUE CONTROL	Dolby Intellectual Property Licensing, LLC	Expired

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237934-US-1	United States of America	8/18/2009	12/542760	US20100139733A1		FUSED WIRING HARNESS FOR A PHOTOVOLTAIC SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
237934-AU-2	Australia	8/18/2010	2010212421			FUSED WIRING HARNESS FOR A PHOTOVOLTAIC SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
237934-CN-3	China	8/18/2010	2.0101E+11	CN101997241A		FUSED WIRING HARNESS FOR A PHOTOVOLTAIC SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
237934-EP-4	European Patent	8/3/2010	10171761.9	EP2287915	1/9/2013	FUSED WIRING HARNESS FOR A PHOTOVOLTAIC SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
238312-EP-5	European Patent	5/6/2011	11165079.2	EP2392553	8/24/2016	DIELECTRIC MATERIALS FOR POWER TRANSFER SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
238312-SG-8	Singapore	5/12/2011	201103421-2	SG176379		DIELECTRIC MATERIALS FOR POWER TRANSFER SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
238312-EP-11	European Patent	5/6/2011	11165080	EP2386531	11/9/2016	DIELECTRIC MATERIALS FOR POWER TRANSFER SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
238346-EP-3	European Patent	8/2/2010	10171542.3	EP2288000		APPARATUS AND METHOD FOR BEARING	Dolby Intellectual Property Licensing, LLC	Expired
238407-EP-2	European Patent	8/19/2010	10173474.7	EP2290650	11/28/2012	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
238407-TW-3	Taiwan	8/19/2010	99127813	TW524337	3/1/2016	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
238407-CN-4	China	8/31/2010	201010277335.X	CN201010277335.X	5/13/2015	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
238407-JP-5	Japan	8/24/2010	2010-186776	JP5496823	3/14/2014	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
238407-KR-6	Korea, Republic of (KR)	8/30/2010	1.0201E+12	KR10-1716500	3/8/2017	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
238407-DE-8	Germany (Federal Republic of)	8/19/2010	10173474.7	DE602010003810.6	11/28/2012	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
238407-FR-9	France	8/19/2010	10173474.7	FR2290650	11/28/2012	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
238407-GB-10	United Kingdom	8/19/2010	10173474.7	GB2290650	11/28/2012	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
238413-EP-3	European Patent	1/28/2011	11152533.3	EP2355096		HANDOFFS BETWEEN DIFFERENT VOICE ENCODER SYSTEMS	Dolby Intellectual Property Licensing, LLC	Expired
238414-EP-3	European Patent	3/8/2011	11157344	EP2365712		HANDOFF METRIC FOR MULTIPLE TRANSMISSION TECHNOLOGIES	Dolby Intellectual Property Licensing, LLC	Expired
238727-WO-2	Patent Cooperation Treaty	11/10/2010	PCT/US10/56099	WO2011/081717		ENERGY STORAGE DEVICE	Dolby Intellectual Property Licensing, LLC	Expired
238789-EP-3	European Patent	11/19/2010	10191932.2	EP2328160	2/28/2018	SWITCH STRUCTURES	Dolby Intellectual Property Licensing, LLC	Expired
238794-EP-3	European Patent	9/17/2010	10177345.5	EP2315221	11/14/2012	SWITCH STRUCTURE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
238794-JP-4	Japan	9/9/2010	2010-201497	JP2011091029		SWITCH STRUCTURE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired

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238794-GB-8	United Kingdom	9/17/2010	10177345.5	GB2315221	11/14/2012	SWITCH STRUCTURE AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
239040-EP-3	European Patent	12/14/2010	10194998	EP2337183	7/23/2014	APPARATUS AND METHOD FOR RAPID CHARGING USING SHARED POWER ELECTRONICS	Dolby Intellectual Property Licensing, LLC	Expired
239040-IN-5	India	12/14/2010	3822/CHE/2010	IN2010CH03822		APPARATUS AND METHOD FOR RAPID CHARGING USING SHARED POWER ELECTRONICS	Dolby Intellectual Property Licensing, LLC	Expired
239040-US-14	United States of America	7/26/2022	17/873,357			APPARATUS AND METHOD FOR RAPID CHARGING USING SHARED POWER ELECTRONICS	Dolby Intellectual Property Licensing, LLC	Expired
239053-EP-3	European Patent	4/4/2011	11160945.9	EP2375620	6/8/2016	DIVISION FREE DUPLEXING NETWORKS	Dolby Intellectual Property Licensing, LLC	Expired
239322-EP-3	European Patent	8/20/2010	10173623.9	EP2290810	6/25/2014	SYSTEM AND METHOD FOR NON-SINUSOIDAL CURRENT WAVEFORM EXCITATION OF ELECTRICAL MACHINES	Dolby Intellectual Property Licensing, LLC	Expired
239382-EP-3	European Patent	6/22/2011	11170924.2	EP2403129	8/13/2014	SYSTEM AND METHOD FOR NON-SINUSOIDAL CURRENT WAVEFORM EXCITATION OF ELECTRICAL GENERATORS	Dolby Intellectual Property Licensing, LLC	Expired
239382-JP-5	Japan	6/22/2011	2011-137895	JP2012016267		SYSTEM AND METHOD FOR NON-SINUSOIDAL CURRENT WAVEFORM EXCITATION OF ELECTRICAL GENERATORS	Dolby Intellectual Property Licensing, LLC	Expired
239449-IN-5	India	8/13/2010	1911/DEL/2010	IN1911DEL2010		APPARATUS FOR TRANSFERRING ENERGY USING ONBOARD POWER ELECTRONICS AND METHOD OF MANUFACTURING SAME	Dolby Intellectual Property Licensing, LLC	Expired
239451-EP-3	European Patent	7/14/2011	11173959.5	EP2410639	6/11/2014	HIGH POWER-DENSITY, HIGH EFFICIENCY, NON-PERMANENT MAGNET ELECTRIC MACHINE	Dolby Intellectual Property Licensing, LLC	Expired
241038-JP-4	Japan	12/26/2011	2011-282553	JP2012142934		POWER SWITCHING SYSTEM INCLUDING A MICROELECTROMECHANICAL SYSTEM (MEMS) ARRAY	Dolby Intellectual Property Licensing, LLC	Expired
241400-CN-2	China	4/20/2011	2.0111E+11	CN102298952	3/16/2016	ENERGY AND SPACE EFFICIENT DETECTION FOR DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
241400-EP-3	European Patent	4/13/2011	11162301.3	EP2381447		ENERGY AND SPACE EFFICIENT DETECTION FOR DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
241400-JP-4	Japan	4/14/2011	2011-089658	JP2011227985		ENERGY AND SPACE EFFICIENT DETECTION FOR DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
241400-KR-5	Korea, Republic of (KR)	4/20/2011	1.02011E+12	KR1020111117616A		ENERGY AND SPACE EFFICIENT DETECTION FOR DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
241400-TW-6	Taiwan	4/21/2011	100113939	TWI533296	5/11/2016	ENERGY AND SPACE EFFICIENT DETECTION FOR DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
241407-EP-3	European Patent	4/11/2011	11161812	EP2378731	3/30/2016	GENERALIZED DIVISION FREE DUPLEXING TECHNIQUES FOR DECREASING RENDEVOUS TIME	Dolby Intellectual Property Licensing, LLC	Expired

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241411-US-1	United States of America	3/22/2010	12/713361	US20110231155A1		DYNAMICALLY CONFIGURABLE SENSOR CHASSIS	Dolby Intellectual Property Licensing, LLC	Expired
241411-EP-3	European Patent	3/11/2011	11157805	EP2369748		DYNAMICALLY CONFIGURABLE SENSOR CHASSIS	Dolby Intellectual Property Licensing, LLC	Expired
241411-KR-4	Korea, Republic of (KR)	3/21/2011	1.02011E+12	KR102011106239A		DYNAMICALLY CONFIGURABLE SENSOR CHASSIS	Dolby Intellectual Property Licensing, LLC	Expired
241497-EP-3	European Patent	12/10/2010	10194449.4	EP2337043	3/30/2016	SWITCH STRUCTURE AND ASSOCIATED CIRCUIT	Dolby Intellectual Property Licensing, LLC	Expired
241826-EP-3	European Patent	2/24/2011	11155784.9	EP2362525		ROTOR STRUCTURE FOR INTERIOR PERMANENT MAGNET ELECTROMOTIVE MACHINE	Dolby Intellectual Property Licensing, LLC	Expired
241843-EP-3	European Patent	6/14/2011	11169822.1	EP2398028	8/12/2015	MEMS SWITCHING ARRAY HAVING A SUBSTRATE	Dolby Intellectual Property Licensing, LLC	Expired
242485-WO-2	Patent Cooperation Treaty	3/16/2012	PCT/US2012/029326	WO2012129061		SYSTEM AND METHOD FOR CONTACTLESS POWER TRANSFER IN IMPLANTABLE DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
242903-EP-3	European Patent	10/31/2011	11187315.4	EP2450927	1/4/2017	MEMS-BASED SWITCHING SYSTEMS	Dolby Intellectual Property Licensing, LLC	Expired
243942-BR-2	Brazil	10/31/2011	PI1104288-5	BR1104288		LOW-INDUCTANCE, HIGH-EFFICIENCY INDUCTION MACHINE AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243942-EP-4	European Patent	11/15/2011	11189255	EP2456066	3/7/2018	LOW-INDUCTANCE, HIGH-EFFICIENCY INDUCTION MACHINE AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243942-JP-6	Japan	11/16/2011	2011-250219	JP2012115134		LOW-INDUCTANCE, HIGH-EFFICIENCY INDUCTION MACHINE AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243942-DE-7	Germany (Federal Republic of)	11/15/2011	11189255	DE602011046224.5	3/7/2018	LOW-INDUCTANCE, HIGH-EFFICIENCY INDUCTION MACHINE AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243942-FR-8	France	11/15/2011	11189255	FR2456066	3/7/2018	LOW-INDUCTANCE, HIGH-EFFICIENCY INDUCTION MACHINE AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243942-GB-9	United Kingdom	11/15/2011	11189255	GB2456066	3/7/2018	LOW-INDUCTANCE, HIGH-EFFICIENCY INDUCTION MACHINE AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243942-IT-10	Italy	11/15/2011	5.02018E+14	IT2456066	3/7/2018	LOW-INDUCTANCE, HIGH-EFFICIENCY INDUCTION MACHINE AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243942-ES-11	Spain	11/15/2011	11189255	ES2456066	3/7/2018	LOW-INDUCTANCE, HIGH-EFFICIENCY INDUCTION MACHINE AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243944-JP-6	Japan	11/14/2011	2011-248140	JP2012115133		HIGH POWER-DENSITY, HIGH BACK EMF PERMANENT MAGNET MACHINE AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired

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243944-US-8	United States of America	5/19/2017	15/600086	US20170257050		HIGH POWER-DENSITY, HIGH BACK EMF PERMANENT MAGNET MACHINE AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243956-US-1	United States of America	11/19/2010	12/949862	US20120126728A1		INTEGRATED ELECTRIC MACHINE AND SILICON CARBIDE POWER CONVERTER ASSEMBLY AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243956-BR-2	Brazil	11/10/2011	PI 1105062-4	BRPI1105062		INTEGRATED ELECTRIC MACHINE AND SILICON CARBIDE POWER CONVERTER ASSEMBLY AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243956-EP-4	European Patent	11/15/2011	11189253.5	EP2456054		INTEGRATED ELECTRIC MACHINE AND SILICON CARBIDE POWER CONVERTER ASSEMBLY AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243956-IN-5	India	11/18/2011	3298/DEL/2011	IN3298/DEL/2011		INTEGRATED ELECTRIC MACHINE AND SILICON CARBIDE POWER CONVERTER ASSEMBLY AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243956-JP-6	Japan	11/16/2011	2011-250220	JP2012115135		INTEGRATED ELECTRIC MACHINE AND SILICON CARBIDE POWER CONVERTER ASSEMBLY AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
243963-SE-5	Sweden	5/20/2011	1150471-9			High Speed Self-Cascaded Electric Machines	Dolby Intellectual Property Licensing, LLC	Expired
244088-WO-2	Patent Cooperation Treaty	6/29/2011	US11/42322	WO12/21222		RECHARGEABLE ELECTROCHEMICAL CELL AND METHOD OF MANUFACTURING A RECHARGEABLE ELECTROCHEMICAL CELL	Dolby Intellectual Property Licensing, LLC	Expired
244092-EP-3	European Patent	7/26/2012	12178134.8	EP2551866	4/2/2014	ELECTRICAL DISRIBUTION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
244092-DE-5	Germany (Federal Republic of)	7/26/2012	12178134.8	DE2551866	4/2/2014	ELECTRICAL DISRIBUTION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
244295-BR-2	Brazil	4/15/2011	PI1101994-8	BRPI1101994		AUTOMATIC ERROR CONTROL SCHEME SELECTION FOR FIXED-LENGTH MESSAGES BASED UPON MESSAGE PAYLOAD SIZE	Dolby Intellectual Property Licensing, LLC	Expired
244295-CA-3	Canada	3/31/2011	2735762			AUTOMATIC ERROR CONTROL SCHEME SELECTION FOR FIXED-LENGTH MESSAGES BASED UPON MESSAGE PAYLOAD SIZE	Dolby Intellectual Property Licensing, LLC	Expired
245295-CA-2	Canada	12/1/2011	2760215			OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
245295-CN-3	China	12/14/2011	2.0111E+11	CN102592613	8/31/2016	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
245295-EP-4	European Patent	12/6/2011	11192101.1	EP2466582	2/26/2014	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
245295-JP-5	Japan	11/24/2011	2011-255656	JP5903252	3/18/2016	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired

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245295-KR-6	Korea, Republic of (KR)	12/13/2011	1.02011E+12	KR102012066596A		OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
245295-TW-7	Taiwan	12/6/2011	100144926	TWI536377	6/1/2016	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
245295-DE-8	Germany (Federal Republic of)	12/6/2011	11192101.1	DE2466582	2/26/2014	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
245295-GB-9	United Kingdom	12/6/2011	11192101.1	GB2466582	2/26/2014	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
245295-NL-10	Netherlands	12/6/2011	11192101.1	NL2466582	2/26/2014	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
245295-FR-11	France	12/6/2011	11192101.1	FR2466582	2/26/2014	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
245295-NO-12	Norway	12/6/2011	11192101.1	NO2466582	2/26/2014	OPTICAL DATA STORAGE MEDIA AND METHODS FOR USING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
246897-WO-2	Patent Cooperation Treaty	9/10/2012	PCT/US12/054405	WO2013048704		ELECTROCHEMICAL CELLS	Dolby Intellectual Property Licensing, LLC	Expired
246939-BR-2	Brazil	12/22/2011	PI 1105336-4	BRPI 110533		ELECTRIC MOTOR STRUCTURE TO ELECTRO-MAGNETIC INTERFERENCE	Dolby Intellectual Property Licensing, LLC	Expired
246939-CN-4	China	12/23/2011	2.0111E+11	CN102545446A		ELECTRIC MOTOR STRUCTURE TO MINIMIZE ELECTRO-MAGNETIC INTERFERENCE	Dolby Intellectual Property Licensing, LLC	Expired
246939-EP-5	European Patent	12/15/2011	11193656.3	EP2469687		ELECTRIC MOTOR STRUCTURE TO MINIMIZE ELECTRO-MAGNETIC INTERFERENCE	Dolby Intellectual Property Licensing, LLC	Expired
246939-IN-6	India	12/16/2011	3680/DEL/2011	IN3680/DEL/2011		ELECTRIC MOTOR STRUCTURE TO MINIMIZE ELECTRO-MAGNETIC INTERFERENCE	Dolby Intellectual Property Licensing, LLC	Expired
246939-JP-7	Japan	12/20/2011	2011-277762	JP2012135199		ELECTRIC MOTOR STRUCTURE TO MINIMIZE ELECTRO-MAGNETIC INTERFERENCE	Dolby Intellectual Property Licensing, LLC	Expired
246939-CN-8	China	3/22/2018	2.0181E+11	CN108574359		ELECTRIC MOTOR STRUCTURE TO MINIMIZE ELECTROMAGNETIC INTERFERENCE	Dolby Intellectual Property Licensing, LLC	Expired
246995-US-2	United States of America	12/7/2012	13/708436	US20130149590A1		AN ALKALI METAL-METAL HALIDE BATTERY	Dolby Intellectual Property Licensing, LLC	Expired
247243-WO-2	Patent Cooperation Treaty	11/29/2011	US11/62275	WO 2012/087495		COMPOSITION, ENERGY STORAGE DEVICE, AND RELATED PROCESSES	Dolby Intellectual Property Licensing, LLC	Expired
247255-IN-4	India	4/13/2012	1135/DEL/2012	IN1135DEL2012		SYSTEM, METHOD, AND APPARATUS FOR RESOLVING ERRORS IN A SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
247550-US-1	United States of America	9/30/2011	13/250680	US20130084486A1		ELECTROCHEMICAL CELLS INCLUDING A CONDUCTIVE MATRIX	Dolby Intellectual Property Licensing, LLC	Expired

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247550-WO-2	Patent Cooperation Treaty	9/10/2012	PCT/US12/054422			ELECTROCHEMICAL CELLS INCLUDING A CONDUCTIVE MATRIX	Dolby Intellectual Property Licensing, LLC	Expired
248221-SG-4	Singapore	3/22/2012	201202096-2	SG184683		APPARATUS AND METHOD FOR CONTACTLESS HIGH RESOLUTION HANDPRINT CAPTURE	Dolby Intellectual Property Licensing, LLC	Expired
248986-US-1	United States of America	11/30/2011	13/307262	US20130134018A1		A MICRO-ELECTROMECHANICAL SWITCH AND A RELATED METHOD THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
248986-WO-2	Patent Cooperation Treaty	10/25/2012	PCT/US2012/061820	WO2013081746		A MICRO-ELECTROMECHANICAL SWITCH AND A RELATED METHOD THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
248986-JP-5	Japan	10/25/2012	2014-544738	JP2015501069		A MICRO-ELECTROMECHANICAL SWITCH AND A RELATED METHOD THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
249074-EP-4	European Patent	1/16/2013	13151418.4	EP2617688	5/2/2018	SEALING GLASS COMPOSITION AND ARTICLE	Dolby Intellectual Property Licensing, LLC	Expired
249090-EP-2	European Patent	9/26/2013	13186251.8	EP2713379	12/20/2017	A SWITCHING APPARATUS INCLUDING GATING CIRCUITRY FOR ACTUATING MICRO-ELECTROMECHANICAL SYSTEM MEMS SWITCHES	Dolby Intellectual Property Licensing, LLC	Expired
249187-US-1	United States of America	5/27/2011	13/117542			BATTERY CELL DESIGN AND METHOD OF COOLING BATTERY CELLS	Dolby Intellectual Property Licensing, LLC	Expired
249391-WO-2	Patent Cooperation Treaty	3/20/2013	PCT/US2013/033062	WO2013142553		SYSTEM AND METHOD FOR ISLANDING DETECTION AND PROTECTION	Dolby Intellectual Property Licensing, LLC	Expired
250286-CN-2	China	4/27/2012	2.0121E+11	CN103377382A		OPTIMUM GRADIENT PURSUIT FOR IMAGE ALIGNMENT	Dolby Intellectual Property Licensing, LLC	Expired
250286-DE-3	Germany (Federal Republic of)	4/27/2012	1.02012E+11	DE102012103738		OPTIMAL GRADIENT PURSUIT FOR IMAGE ALIGNMENT	Dolby Intellectual Property Licensing, LLC	Expired
250286-GB-4	United Kingdom	4/17/2012	1206744.3	GB2501270		OPTIMAL GRADIENT PURSUIT FOR IMAGE ALIGNMENT	Dolby Intellectual Property Licensing, LLC	Expired
250286-JP-5	Japan	4/24/2012	2012-098291	JP5953097	6/17/2016	OPTIMAL GRADIENT PURSUIT FOR IMAGE ALIGNMENT	Dolby Intellectual Property Licensing, LLC	Expired
250286-KR-6	Korea, Republic of (KR)	4/27/2012	1.02012E+12	KR102013121360A		OPTIMAL GRADIENT PURSUIT FOR IMAGE ALIGNMENT	Dolby Intellectual Property Licensing, LLC	Expired
250455-US-1	United States of America	12/30/2011	13/341052	US20130171487A1		RECHARGEABLE BATTERY AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
250455-CN-2	China	12/31/2012	2.01221E+11	CN201220744711.6	11/20/2013	RECHAREGABLE BATTERY AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
250455-EP-6	European Patent	12/18/2012	12197725	EP2610943	2/15/2017	RECHAREGABLE BATTERY AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
250744-CN-2	China	12/28/2012	2.01221E+11	CN201220737334.3	12/4/2013	RECHARGEABLE BATTERY SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired

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250841-BR-2	Brazil	8/10/2012	BR102012020046-5	BR102012020046		SYSTEM AND METHOD FOR DEPTH FROM DEFOCUS IMAGING	Dolby Intellectual Property Licensing, LLC	Expired
251009-US-1	United States of America	11/30/2011	13/308386	US20130138499A1		USAGE MEASURENT TECHNIQUES AND SYSTEMS FOR INTERACTIVE ADVERTISING	Dolby Intellectual Property Licensing, LLC	Expired
251009-CN-4	China	11/30/2012	2.01211E+11	CN103137046A		USAGE MEASURENT TECHNIQUES AND SYSTEMS FOR INTERACTIVE ADVERTISING	Dolby Intellectual Property Licensing, LLC	Expired
251344-US-1	United States of America	8/30/2011	13/221896	US20130054377A1		PERSON TRACKING AND INTERACTIVE ADVERTISING	Dolby Intellectual Property Licensing, LLC	Expired
251344-DE-3	Germany (Federal Republic of)	6/29/2012	1.02012E+11	DE102012105754		PERSON TRACKING AND INTERACTIVE ADVERTISING	Dolby Intellectual Property Licensing, LLC	Expired
251344-US-7	United States of America	6/10/2019	16/436,583	US-2019-0311661-A1		PERSON TRACKING AND INTERACTIVE ADVERTISING	Dolby Intellectual Property Licensing, LLC	Expired
251485-WO-2	Patent Cooperation Treaty	9/11/2012	PCT/US12/054541	WO2013039848		THERMAL MANAGEMENT DEVICE	Dolby Intellectual Property Licensing, LLC	Expired
252223-WO-2	Patent Cooperation Treaty	12/5/2012	US12/67864	WO2013/101411		METHOD AND SYSTEM FOR CONTROLLING ENERGY STORAGE DEVICE	Dolby Intellectual Property Licensing, LLC	Expired
252382-IN-5	India	8/1/2012	2380/DEL/2012	IN2380DEL2012		APPARATUS AND METHOD FOR CHARGING AN ELECTRIC VEHICLE	Dolby Intellectual Property Licensing, LLC	Expired
252665-EP-2	European Patent	11/7/2012	12191698.5	EP2592747	3/7/2018	METHOD AND SYSTEM FOR CONTROLLING MOTOR	Dolby Intellectual Property Licensing, LLC	Expired
252995-US-1	United States of America	5/30/2012	13/483841			ACTIVE BRAZE TECHNIQUES ON BETA-ALUMINA	Dolby Intellectual Property Licensing, LLC	Expired
253755-WO-2	Patent Cooperation Treaty	2/15/2013	PCT/US2013/026496	WO2013123433		NEGATIVE SEQUENCE CURRENT COMPENSATION CONTROLLER AND METHOD FOR POWER CONVERSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
254472-WO-2	Patent Cooperation Treaty	1/10/2013	US13/20989	WO2013115950		ELECTRODE COMPOSITIONS, ENERGY STORAGE DEVICES AND RELATED METHODS	Dolby Intellectual Property Licensing, LLC	Expired
254472-EP-3	European Patent	1/10/2013	13701179.7	EP2810323	5/30/2018	ELECTRODE COMPOSITIONS, ENERGY STORAGE DEVICES AND RELATED METHODS	Dolby Intellectual Property Licensing, LLC	Expired
254566-WO-2	Patent Cooperation Treaty	4/24/2013	PCT/US2013/037927	WO2013163266		SYSTEM AND METHOD FOR OPEN-CIRCUIT FAULT DETECTION	Dolby Intellectual Property Licensing, LLC	Expired
254869-US-1	United States of America	10/25/2011	61/551047			Integrated Power System Control Method and Related Apparatus with Energy Storage Element	Dolby Intellectual Property Licensing, LLC	Expired
254869-EP-5	European Patent	10/22/2012	12189424	EP2587607	7/12/2017	Integrated Power System Control Method and Related Apparatus with Energy Storage Element	Dolby Intellectual Property Licensing, LLC	Expired

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254869-IN-7	India	10/1/2012	3080/DEL/2012	IN3080DEL2012		Integrated Power System Control Method and Related Apparatus with Energy Storage Element	Dolby Intellectual Property Licensing, LLC	Expired
254993-WO-2	Patent Cooperation Treaty	12/7/2012	PCT/US2012/068550	WO2013101435		MODULAR HIGH TEMPERATURE BATTERY ELECTRICAL CONFIGURATIONS	Dolby Intellectual Property Licensing, LLC	Expired
256606-US-1	United States of America	5/25/2012	61/651817			COMPOSITIONS FOR BRAZING, AND RELATED METHODS AND DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
256606-US-3	United States of America	8/31/2012	13/600333	US20130316226A1		BRAZE COMPOSITIONS, AND RELATED DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
256606-CN-4	China	5/24/2013	2.0131E+11	CN103418932		BRAZE COMPOSITIONS, AND RELATED DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
256606-CN-12	China	5/24/2013	2.0131E+11	CN103418931		BRAZE COMPOSITIONS, AND RELATED DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
256606-KR-16	Korea, Republic of (KR)	5/22/2013	1.02013E+12	KR102013132293A		BRAZE COMPOSITIONS, AND RELATED DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
256606-US-17	United States of America	9/6/2018	16/124,120	US20190001445		BRAZE COMPOSITIONS, AND RELATED DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
257085-US-1	United States of America	5/23/2012	61/650890			ENERGY STORAGE CELL AND METHOD OF ASSEMBLY	Dolby Intellectual Property Licensing, LLC	Expired
257472-US-1	United States of America	11/16/2011	61/560580			METHOD FOR REMODELING OF ELECTRIC VEHICLE ADOPTION	Dolby Intellectual Property Licensing, LLC	Expired
257472-WO-3	Patent Cooperation Treaty	11/16/2012	PCT/US12/065414	WO2013/074864		METHOD AND SYSTEM FOR ELECTRIC VEHICLE ADOPTION SIMULATION WITH REASONING	Dolby Intellectual Property Licensing, LLC	Expired
257939-WO-2	Patent Cooperation Treaty	6/28/2013	PCT/US2013/048500	WO2014018220		OPEN CIRCUIT VOLTAGE CHECKING FOR A BATTERY SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
259236-US-1	United States of America	9/13/2012	61/700490			ACTION BASED VIDEO SUMMARIZATION FOR CONVENIENCE STORES	Dolby Intellectual Property Licensing, LLC	Expired
259236-WO-3	Patent Cooperation Treaty	9/12/2013	PCT/US2013/059478	WO2014043359		SYSTEM AND METHOD FOR GENERATING AN ACTIVITY SUMMARY OF A PERSON	Dolby Intellectual Property Licensing, LLC	Expired
259236-AU-4	Australia	9/12/2013	2013315497			SYSTEM AND METHOD FOR GENERATING AN ACTIVITY SUMMARY OF A PERSON	Dolby Intellectual Property Licensing, LLC	Expired
259236-BR-5	Brazil	9/12/2013	112015005543-5			SYSTEM AND METHOD FOR GENERATING AN ACTIVITY SUMMARY OF A PERSON	Dolby Intellectual Property Licensing, LLC	Expired
259236-CN-6	China	9/12/2013	2.0138E+11	CN104823438		SYSTEM AND METHOD FOR GENERATING AN ACTIVITY SUMMARY OF A PERSON	Dolby Intellectual Property Licensing, LLC	Expired
259236-EP-7	European Patent	9/12/2013	13770576	EP2896199		SYSTEM AND METHOD FOR GENERATING AN ACTIVITY SUMMARY OF A PERSON	Dolby Intellectual Property Licensing, LLC	Expired
259236-AU-11	Australia	9/12/2013	2017206244			SYSTEM AND METHOD FOR GENERATING AN ACTIVITY SUMMARY OF A PERSON	Dolby Intellectual Property Licensing, LLC	Expired

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259236-AU-12	Australia	9/12/2013	2019213309			ACTION BASED VIDEO SUMMARIZATION FOR CONVENIENCE STORES	Dolby Intellectual Property Licensing, LLC	Expired
259278-EP-3	European Patent	5/16/2013	13168098.5	EP2667396	1/6/2016	CONTACTOR ISOLATION METHOD AND APPARATUS	Dolby Intellectual Property Licensing, LLC	Expired
259422-IN-5	India	5/15/2013	1446/DEL/2013	IN1446DEL2013		SYSTEM FOR TRANSFERRING ENERGY FROM AN ENERGY SOURCE AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired
260416-US-1	United States of America	10/19/2012	61/715906			Wireless Feeler Gauge	Dolby Intellectual Property Licensing, LLC	Expired
260416-WO-3	Patent Cooperation Treaty	10/11/2013	PCT/US2013/064446	WO2014062484		DIGITAL FEELER GAUGE AND METHOD OF USING SAME	Dolby Intellectual Property Licensing, LLC	Expired
261519-EP-2	European Patent	11/12/2013	13192515.8	EP2731190		COMPOSITION, ENERGY STORAGE DEVICE, AND RELATED PROCESS	Dolby Intellectual Property Licensing, LLC	Expired
261528-EP-6	European Patent	9/23/2013	13185598.3	EP2712073		POWER CONVERSION SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
262057-CN-1	China	9/24/2012	2.0121E+11	CN103660967A		MOBILE TRANSPORTATION EQUIPMENT WITH IMPROVED ENERGY SUPPLYING MECHANISM AND MOBILE TRANSPORTATION METHOD	Dolby Intellectual Property Licensing, LLC	Expired
263939-US-1	United States of America	11/2/2012	61/721743			ENGINE COOLING SYSTEM AND METHOD FOR AN ENGINE	Dolby Intellectual Property Licensing, LLC	Expired
263939-CN-2	China	11/1/2013	2.01321E+11	CN201320686392.2	7/9/2014	ENGINE COOLING SYSTEM FOR AN ENGINE	Dolby Intellectual Property Licensing, LLC	Expired
264203-US-2	United States of America	3/10/2014	14/202674	US20140277884A1		DRIVE SYSTEM AND METHOD FOR DRIVING A VEHICLE	Dolby Intellectual Property Licensing, LLC	Expired
264203-IN-5	India	3/12/2014	1286/CHE/2014			DRIVE SYSTEM AND METHOD FOR DRIVING A VEHICLE	Dolby Intellectual Property Licensing, LLC	Expired
264203-BR-6	Brazil	3/7/2014	102014005311-5	BR1020140055311		DRIVE SYSTEM AND METHOD FOR DRIVING A VEHICLE	Dolby Intellectual Property Licensing, LLC	Expired
264291-US-1	United States of America	9/13/2012	61/700542			SITUATIONAL AWARENESS FOR GAS STATIONS AND SIMILAR COMMERCIAL SITES OF INTEREST	Dolby Intellectual Property Licensing, LLC	Expired
264291-WO-3	Patent Cooperation Treaty	9/12/2013	PCT/US2013/059453	WO2014043340		SYSTEM AND METHOD FOR GENERATING SEMANTIC ANNOTATIONS	Dolby Intellectual Property Licensing, LLC	Expired
264291-BR-5	Brazil	9/12/2013	112015005541-9			SYSTEM AND METHOD FOR GENERATING SEMANTIC ANNOTATIONS	Dolby Intellectual Property Licensing, LLC	Expired
264291-EP-8	European Patent	9/12/2013	13770747.7	EP2895987		SYSTEM AND METHOD FOR GENERATING SEMANTIC ANNOTATIONS	Dolby Intellectual Property Licensing, LLC	Expired
264323-US-1	United States of America	11/2/2012	61/721712			BATTERY MANAGEMENT SYSTEMS AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
264353-TW-2	Taiwan	11/29/2013	102143918	TW201432676		STACKED FILM REFLECTIVE LAYERS FOR MULTI-LAYER OPTICAL DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired

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264353-WO-3	Patent Cooperation Treaty	11/22/2013	PCT/US13/71362	WO2014088834		STACKED FILM REFLECTIVE LAYERS FOR MULTI-LAYER OPTICAL DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
264353-JP-5	Japan	11/22/2013	2015-546501			STACKED FILM REFLECTIVE LAYERS FOR MULTI-LAYER OPTICAL DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
264353-EP-6	European Patent	11/22/2013	13805656.9	EP2929534		STACKED FILM REFLECTIVE LAYERS FOR MULTI-LAYER OPTICAL DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
264353-KR-7	Korea, Republic of (KR)	11/22/2013	10-2015-7018081			STACKED FILM REFLECTIVE LAYERS FOR MULTI-LAYER OPTICAL DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
264353-CN-8	China	11/22/2013	2.0138E+11	CN104903960		STACKED FILM REFLECTIVE LAYERS FOR MULTI-LAYER OPTICAL DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
264353-CA-9	Canada	11/22/2013	2893842			STACKED FILM REFLECTIVE LAYERS FOR MULTI-LAYER OPTICAL DATA STORAGE	Dolby Intellectual Property Licensing, LLC	Expired
265784-JP-5	Japan	8/4/2014	2014-158297	JP2015-033329		SPOKE PERMANENT MAGNET MACHINE WITH REDUCED TORQUE RIPPLE AND METHOD OF MANUFACTURING THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
265784-CN-7	China	8/5/2014	2.01812E+11	CN110224567X		SPOKE PERMANENT MAGNET MACHINE WITH REDUCED TORQUE RIPPLE AND METHOD OF MANUFACTURING THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
265951-WO-2	Patent Cooperation Treaty	10/26/2015	PCT/US15/057308	WO2016089504		MULTICHANNEL RELAY ASSEMBLY WITH IN LINE MEMS SWITCHES	Dolby Intellectual Property Licensing, LLC	Expired
265951-JP-7	Japan	10/26/2015	2017-528881			MULTICHANNEL RELAY ASSEMBLY WITH IN LINE MEMS SWITCHES	Dolby Intellectual Property Licensing, LLC	Expired
265951-KR-8	Korea, Republic of (KR)	10/26/2015	10-2017-7018313	KR10-2017-0090485		MULTICHANNEL RELAY ASSEMBLY WITH IN LINE MEMS SWITCHES	Dolby Intellectual Property Licensing, LLC	Expired
266269-CN-3	China	10/17/2014	2.01411E+11	CN104578472		TORQUE RIPPLE REDUCTION IN ELECTRIC MACHINES	Dolby Intellectual Property Licensing, LLC	Expired
266269-EP-4	European Patent	10/17/2014	14189355.2	EP2863518		TORQUE RIPPLE REDUCTION IN ELECTRIC MACHINES	Dolby Intellectual Property Licensing, LLC	Expired
266269-JP-5	Japan	10/16/2014	2014-211282	JP2015-080403		TORQUE RIPPLE REDUCTION IN ELECTRIC MACHINES	Dolby Intellectual Property Licensing, LLC	Expired
266271-EP-3	European Patent	11/3/2014	14191515.7	EP2869529	8/31/2016	SYSTEMS AND METHODS FOR SECURE FILE TRANSFERS	Dolby Intellectual Property Licensing, LLC	Expired
267009-WO-2	Patent Cooperation Treaty	9/29/2014	PCT/US2014/058038	WO2015048639		SYSTEM AND METHOD FOR DETERMINING A HYDRATION LEVEL OF A TISSUE REGION	Dolby Intellectual Property Licensing, LLC	Expired
267351-EP-3	European Patent	7/10/2014	14176572.7	EP2849112		SYSTEMS AND METHODS FOR DATA LOSS PREVENTION	Dolby Intellectual Property Licensing, LLC	Expired
267351-IN-5	India	7/14/2014	3477/CHE/2014			SYSTEMS AND METHODS FOR DATA LOSS PREVENTION	Dolby Intellectual Property Licensing, LLC	Expired
267819-US-5	United States of America	11/1/2016	15/340131	US20170054335A1		SYSTEM AND METHOD FOR SMOOTHING A SALIENT ROTOR IN ELECTRICAL MACHINES	Dolby Intellectual Property Licensing, LLC	Expired
267847-EP-2	European Patent	7/21/2014	14177828.2	EP2830182	9/6/2017	ISOLATED BATTERY MANAGEMENT SYSTEMS AND METHODS THEREOF	Dolby Intellectual Property Licensing, LLC	Expired

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268047-EP-2	European Patent	8/5/2014	14179835.5	EP2840422		PLASMONIC INTERFACE AND METHOD OF MANUFACTURING THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
268047-KR-5	Korea, Republic of (KR)	8/19/2014	1.02014E+12			PLASMONIC INTERFACE AND METHOD OF MANUFACTURING THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
268047-CA-6	Canada	8/14/2014	2859421			PLASMONIC INTERFACE AND METHOD OF MANUFACTURING THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
268102-US-1	United States of America	7/26/2013	13/951979	US20150030901A1		BATTERY HEATER SYSTEMS AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
268102-CN-2	China	7/25/2014	2.0141E+11	CN104347912		BATTERY HEATER SYSTEMS AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
268102-EP-3	European Patent	7/23/2014	14178108.8	EP2830186	12/6/2017	BATTERY HEATER SYSTEMS AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
268102-JP-4	Japan	7/23/2014	2014-149347			BATTERY HEATER SYSTEMS AND METHODS	Dolby Intellectual Property Licensing, LLC	Expired
269205-JP-2	Japan	9/16/2014	2014-187259			IMPROVED APPARATUS AND METHOD FOR ELECTRIC BRAKING	Dolby Intellectual Property Licensing, LLC	Expired
269205-US-3	United States of America	9/16/2014	14/487731	US20150081152A1		IMPROVED APPARATUS AND METHOD FOR ELECTRIC BRAKING	Dolby Intellectual Property Licensing, LLC	Expired
269545-WO-2	Patent Cooperation Treaty	9/4/2014	PCT/US2014/053982	WO2015053885		METHODS AND SYSTEMS FOR A UNIVERSAL WIRELESS PLATFORM FOR ASSET MONITORING	Dolby Intellectual Property Licensing, LLC	Expired
269545-JP-5	Japan	9/4/2014	2016-519847			METHODS AND SYSTEMS FOR A UNIVERSAL WIRELESS PLATFORM FOR ASSET MONITORING	Dolby Intellectual Property Licensing, LLC	Expired
269545-CN-7	China	9/4/2014	2.0148E+11	CN105794180		METHODS AND SYSTEMS FOR A UNIVERSAL WIRELESS PLATFORM FOR ASSET MONITORING	Dolby Intellectual Property Licensing, LLC	Expired
269575-WO-2	Patent Cooperation Treaty	1/9/2015	PCT/US2015/010817	WO2015/108778		PLATELET ACTIVATION AND GROWTH FACTOR RELEASE USING ELECTRIC PULSES	Dolby Intellectual Property Licensing, LLC	Expired
269603-WO-2	Patent Cooperation Treaty	11/20/2014	PCT/US2014/066484	WO2015/108619		ELECTRIC PULSE GENERATION SYSTEMS USING CAPACITIVE COUPLING	Dolby Intellectual Property Licensing, LLC	Expired
269603-CN-10	China	11/20/2014	2.0148E+11	CN105899654		ELECTRIC PULSE GENERATION SYSTEMS USING CAPACITIVE COUPLING	Dolby Intellectual Property Licensing, LLC	Expired
271055-KR-3	Korea, Republic of (KR)	5/19/2015	1.02015E+12			THERMAL CLAMP APPARATUS FOR ELECTRONICS SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
271055-CN-4	China	5/22/2015	2.0151E+11	CN105101747		THERMAL CLAMP APPARATUS FOR ELECTRONICS SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
271261-CN-3	China	5/22/2015	2.0151E+11	CN105130486		METHOD FOR JOINING CERAMIC TO METAL, AND SEALING STRUCTURE THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
271471-US-2	United States of America	10/27/2015	14/924288	US20160118848A1		PERMANENT MAGNET MACHINE	Dolby Intellectual Property Licensing, LLC	Expired

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271474-WO-2	Patent Cooperation Treaty	7/21/2016	PCT/US2016/043319	WO2017039863		ENERGY STORAGE DEVICE WITH REDUCED TEMPERATURE VARIABILITY BETWEEN CELLS	Dolby Intellectual Property Licensing, LLC	Expired
272354-US-1	United States of America	10/9/2013	61/889025			WIRELESS TAPER GAUGE AND METHOD OF USING SAME	Dolby Intellectual Property Licensing, LLC	Expired
272805-US-1	United States of America	2/20/2014	61/942199			CONTROL METHOD FOR REDUCING TORQUE RIPPLE IN SWITCHED RELUCTANCE MOTORS	Dolby Intellectual Property Licensing, LLC	Expired
273156-CN-2	China	12/1/2016	2.01611E+11	CN106893694		ERYTHROCYTE AGGREGATION AND LEUKOCYTE ISOLATION	Dolby Intellectual Property Licensing, LLC	Expired
273156-EP-3	European Patent	11/28/2016	16200924.5	EP3176579		ERYTHROCYTE AGGREGATION AND LEUKOCYTE ISOLATION	Dolby Intellectual Property Licensing, LLC	Expired
273156-JP-4	Japan	11/29/2016	2016-230727			ERYTHROCYTE AGGREGATION AND LEUKOCYTE ISOLATION	Dolby Intellectual Property Licensing, LLC	Expired
273252-EP-2	European Patent	1/28/2015	15152810.6	EP2913217		VEHICLE PROPULSION SYSTEM WITH MULTI-CHANNEL DC BUS AND METHOD OF MANUFACTURING SAME	Dolby Intellectual Property Licensing, LLC	Expired
273252-BR-6	Brazil	1/13/2015	102015000762-0	BR102015000762		VEHICLE PROPULSION SYSTEM WITH MULTI-CHANNEL DC BUS AND METHOD OF MANUFACTURING SAME	Dolby Intellectual Property Licensing, LLC	Expired
273252-EP-11	European Patent	1/28/2015	19181302.1	EP3613625		VEHICLE PROPULSION SYSTEM WITH MULTI-CHANNEL DC BUS AND METHOD OF MANUFACTURING SAME	Dolby Intellectual Property Licensing, LLC	Expired
273252-JP-12	Japan	1/21/2015	2019-116125	JP2019-163060		VEHICLE PROPULSION SYSTEM WITH MULTI-CHANNEL DC BUS AND METHOD OF MANUFACTURING SAME	Dolby Intellectual Property Licensing, LLC	Expired
273345-US-6	United States of America	12/20/2017	15/848823	US20180134170A1		VEHICLE PROPULSION SYSTEM HAVING AN ENERGY STORAGE SYSTEM AND OPTIMIZED METHOD OF CONTROLLING OPERATION THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
274610-EP-6	European Patent	1/11/2016	16150804.9	EP3046242		BI-DIRECTIONAL DC-DC POWER CONVERTER FOR A VEHICLE SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
274698-US-1	United States of America	3/17/2014	61/954182			SYSTEM ARCHITECTURE FOR WIRELESS METROLOGICAL DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
274698-WO-3	Patent Cooperation Treaty	2/23/2015	PCT/US2015/017009	WO2015142477		SYSTEM ARCHITECTURE FOR WIRELESS METROLOGICAL DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
274698-EP-7	European Patent	2/23/2015	15709003.6	EP3120254		SYSTEM ARCHITECTURE FOR WIRELESS METROLOGICAL DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
274984-WO-2	Patent Cooperation Treaty	6/23/2015	PCT/US2015/037155	WO2015/200307		INTEGRATED MICRO-ELECTROMECHANICAL SWITCHES AND A RELATED METHOD THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
275094-IN-4	India	1/14/2016	2.01644E+11			VEHICLE DRIVING SYSTEM AND ENERGY CONTROL METHODS	Dolby Intellectual Property Licensing, LLC	Expired
275094-EP-6	European Patent	1/13/2016	16151031.8	EP3045344		VEHICLE DRIVING SYSTEM AND ENERGY CONTROL METHODS	Dolby Intellectual Property Licensing, LLC	Expired

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275150-US-2	United States of America	11/16/2016	15/352759	US20170070154A1		MULTI-LEVEL DC-DC CONVERTER WITH GALVANIC ISOLATION AND ADAPTIVE CONVERSION RATIO	Dolby Intellectual Property Licensing, LLC	Expired
275327-WO-2	Patent Cooperation Treaty	7/13/2016	PCT/US16/041954	WO2017058335		REFRACTORY SEED METAL FOR ELECTROPLATED MEMS STRUCTURES	Dolby Intellectual Property Licensing, LLC	Expired
277187-WO-2	Patent Cooperation Treaty	4/5/2016	PCT/US16/25990	WO2017176253		ACTIVATED PLATELET COMPOSITON WITH TUNABLE GROWTH FACTOR LEVEL	Dolby Intellectual Property Licensing, LLC	Expired
277201-EP-2	European Patent	12/12/2016	16203484.7	EP3182332		SYSTEMS AND METHODS FOR HAIR SEGMENTATION	Dolby Intellectual Property Licensing, LLC	Expired
277298-WO-2	Patent Cooperation Treaty	2/2/2016	PCT/US16/16075	WO2016140752		ELECTROMECHANICAL SYSTEM SUBSTRATE ATTACHMENT FOR REDUCED THERMAL DEFORMATION	Dolby Intellectual Property Licensing, LLC	Expired
277298-KR-10	Korea, Republic of (KR)	2/2/2016	10-2022-7029006			ELECTROMECHANICAL SYSTEM SUBSTRATE ATTACHMENT FOR REDUCED THERMAL DEFORMATION	Dolby Intellectual Property Licensing, LLC	Expired
277870-EP-2	European Patent	12/4/2015	15197958	EP3032216	11/1/2017	METHOD AND APPARATUS FOR MEASURING THICKNESS OF AN OBJECT	Dolby Intellectual Property Licensing, LLC	Expired
278163-WO-2	Patent Cooperation Treaty	2/19/2016	PCT/US16/18583	WO2016190929		ZINC-BASED ELECTROLYTE COMPOSITIONS, AND RELATED ELECTROCHEMICAL PROCESSES AND ARTICLES	Dolby Intellectual Property Licensing, LLC	Expired
278961-CN-2	China	7/22/2016	2.01611E+11	CN106374749		CIRCUITS AND METHODS FOR SYNCHRONOUS RECTIFICATION IN RESONANT CONVERTERS	Dolby Intellectual Property Licensing, LLC	Expired
279301A-WO-2	Patent Cooperation Treaty	7/21/2016	PCT/US16/43282	WO2017039861		RADIO FREQUENCY MICRO-ELECTROMECHANICAL SYSTEMS HAVING INVERTED MICROSTRIP TRANSMISSION LINES AND METHOD OF MAKING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
279412-WO-2	Patent Cooperation Treaty	7/27/2016	PCT/US16/44241	WO2017044195		ENERGY STORAGE DEVICE HAVING IMPROVED THERMAL PERFORMANCE	Dolby Intellectual Property Licensing, LLC	Expired
279748-US-1	United States of America	10/7/2015	14/876892	US20170104244A1		POSITIVE ELECTRODE COMPOSITION FOR OVERDISCHARGE PROTECTION	Dolby Intellectual Property Licensing, LLC	Expired
279748-WO-2	Patent Cooperation Treaty	10/3/2016	PCT/US16/55106	WO2017062297		POSITIVE ELECTRODE COMPOSITION FOR OVERDISCHARGE PROTECTION	Dolby Intellectual Property Licensing, LLC	Expired
279748-EP-5	European Patent	10/3/2016	16781963	EP3360183		POSITIVE ELECTRODE COMPOSITION FOR OVERDISCHARGE PROTECTION	Dolby Intellectual Property Licensing, LLC	Expired
279758-WO-2	Patent Cooperation Treaty	9/9/2016	PCT/US2016/50883	WO2017069861		AUXILIARY CIRCUIT FOR MICRO-ELECTROMECHANICAL SYSTEM RELAY CIRCUIT	Dolby Intellectual Property Licensing, LLC	Expired
279759-WO-2	Patent Cooperation Treaty	10/18/2016	PCT/US16/057483	WO2017070086		MICRO-ELECTROMECHANICAL SYSTEM RELAY CIRCUIT	Dolby Intellectual Property Licensing, LLC	Expired

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279765-WO-2	Patent Cooperation Treaty	10/18/2016	PCT/US16/57509	WO2017070103		ISOLATED CONTROL CIRCUIT AND DRIVER FOR MICRO-ELECTROMECHANICAL SYSTEM SWITCH	Dolby Intellectual Property Licensing, LLC	Expired
280212-WO-2	Patent Cooperation Treaty	7/21/2016	PCT/US16/43279	WO2017/039860		BATTERY MANAGEMENT SYSTEM AND POWER CONNECTOR	Dolby Intellectual Property Licensing, LLC	Expired
280467-CN-1	China	3/31/2015	201510148732.X	CN106143171A		MULTI-SOURCE ENERGY STORAGE SYSTEM AND ENERGY MANAGEMENT AND CONTROL METHOD	Dolby Intellectual Property Licensing, LLC	Expired
280514-CN-1	China	3/31/2015	2.0151E+11	CN106160206A		POWER SUPPLY SYSTEM AND ENERGY STORAGE SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
280514-EP-4	European Patent	3/30/2016	16162904.3	EP3078538		POWER GENERATING SYSTEM AND ENERGY STORAGE SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
280638-EP-2	European Patent	8/26/2016	16185846.9	EP3135527		HYBRID SYSTEM WITH MULTIPLE ENERGY STORAGE DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
280946-WO-2	Patent Cooperation Treaty	9/8/2016	PCT/US16/050706	WO2017044581		HEAT FLUX ASSEMBLY FOR AN ENERGY STORAGE DEVICE	Dolby Intellectual Property Licensing, LLC	Expired
281041-US-2	United States of America	3/30/2017	15/474405	US20170282310A1		EUTECTIC BRAZING COMPOSITIONS, AND RELATED PROCESSES AND DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
281127-WO-2	Patent Cooperation Treaty	7/20/2016	PCT/US16/043035	WO2017030724		SYSTEMS AND METHODS TO SAMPLE CURRENT MEASUREMENTS IN ENERGY STORAGE DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
281133-WO-2	Patent Cooperation Treaty	12/29/2016	PCT/US2016/069197	WO2017117385		Calcium controlled activation of platelets via electrical stimulation	Dolby Intellectual Property Licensing, LLC	Expired
282674-US-1	United States of America	10/30/2015	62/248784			METHODS, SYSTEMS, APPARATUS, AND STORAGE MEDIA FOR USE IN DETECTING ANOMALOUS BEHAVIOR AND/OR IN PREVENTING DATA LOSS	Dolby Intellectual Property Licensing, LLC	Expired
283249-US-1	United States of America	4/25/2016	62/327043			SLEEVE ROTOR SYNCHRONOUS RELUCTANCE MOTOR	Dolby Intellectual Property Licensing, LLC	Expired
283249-CN-5	China	4/25/2017	2.0171E+11	CN107370261		SLEEVE ROTOR SYNCHRONOUS RELUCTANCE ELECTRIC MACHINE	Dolby Intellectual Property Licensing, LLC	Expired
283282-WO-2	Patent Cooperation Treaty	11/10/2016	PCT/US16/061220	WO2017083452		VOLTAGE GROUPING OF ENERGY STORAGE UNITS	Dolby Intellectual Property Licensing, LLC	Expired
283283-WO-2	Patent Cooperation Treaty	11/2/2016	PCT/US16/060013	WO2017083144		ADJUSTABLE TAP LOCATION FOR ENERGY STORAGE CELLS	Dolby Intellectual Property Licensing, LLC	Expired
283495-CN-1	China	3/30/2016	201610192001.X	CN 107294145A		CHARGING DEVICE, SYSTEM AND METHOD	Dolby Intellectual Property Licensing, LLC	Expired
283516-US-7	United States of America	11/6/2019	16/675,703	US20200070643		INTEGRATED CHARGER FOR VEHICLES AND METHOD OF MAKING SAME	Dolby Intellectual Property Licensing, LLC	Expired

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283956-WO-2	Patent Cooperation Treaty	4/26/2017	PCT/US2017/029528	WO/2017/189658		POWER CONVERTER TOPOLOGY FOR USE IN AN ENERGY STORAGE SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
283956-EP-4	European Patent	4/26/2017	17721943.3	EP3449558		POWER CONVERTER TOPOLOGY FOR USE IN AN ENERGY STORAGE SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
283956-JP-6	Japan	4/26/2017	2018-555755			POWER CONVERTER TOPOLOGY FOR USE IN AN ENERGY STORAGE SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
283956-KR-7	Korea, Republic of (KR)	4/26/2017	1.02019E+12			POWER CONVERTER TOPOLOGY FOR USE IN AN ENERGY STORAGE SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
284050-IN-6	India	3/10/2017	2.01744E+11			TOPICAL APPLICATION OF NERVE LABELING DYES FOR IMAGE-GUIDED SURGERY	Dolby Intellectual Property Licensing, LLC	Expired
285698-EP-2	European Patent	5/2/2017	17168930	EP3242323		BRIDGE LEG CIRCUIT ASSEMBLY AND FULL-BRIDGE CIRCUIT ASSEMBLY	Dolby Intellectual Property Licensing, LLC	Expired
285699-CN-1	China	8/12/2016	201610666183.X	CN107732875A		SOLID STATE CIRCUIT BREAKER AND MOTOR DRIVING SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
285990-CN-4	China	2/3/2017	2.0171E+11	CN107040045		SYSTEM AND METHOD FOR PROTECTING A WIRELESS POWER TRANSFER SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
287419-US-1	United States of America	1/25/2016	62/286482			Integrated, Low Cost Photo-Thermal Spectroscopy Reader and Method of Use	Dolby Intellectual Property Licensing, LLC	Expired
287419-TW-3	Taiwan	7/24/2017	106124769	TW201808228		FIXED OPTICS PHOTO-THERMAL SPECTROSCOPY READER AND METHOD OF USE	Dolby Intellectual Property Licensing, LLC	Expired
287419-WO-4	Patent Cooperation Treaty	7/21/2017	PCT/US2017/043217	WO2018/017921		FIXED OPTICS PHOTO-THERMAL SPECTROSCOPY READER AND METHOD OF USE	Dolby Intellectual Property Licensing, LLC	Expired
309222-US-1	United States of America	4/30/2010	61/330091			ROTATING ELECTRIC MACHINE, ESPECIALLY SYNCHRONOUS PERMANENT MAGNET MACHINE	Dolby Intellectual Property Licensing, LLC	Expired
309222-WO-3	Patent Cooperation Treaty	4/29/2011	PCT/EP2011/056813	WO2011135062		ROTATING ELECTRIC MACHINE, ESPECIALLY SYNCHRONOUS PERMANENT MAGNET MACHINE	Dolby Intellectual Property Licensing, LLC	Expired
313124-WO-2	Patent Cooperation Treaty	6/27/2017	PCT/US17/039537	WO2018005520		SYSTEM AND METHOD FOR FAULT INTERRUPTION WITH MEMS SWITCHES	Dolby Intellectual Property Licensing, LLC	Expired
314005-WO-2	Patent Cooperation Treaty	4/17/2018	PCT/US18/27849	WO2018195003		VEHICLE AND CONTROL METHOD THEREOF AND SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
314571-WO-2	Patent Cooperation Treaty	7/9/2018	PCT/US18/41222	WO2019/040190		Architecture for creating 3D model of an object using information from sparse point cloud as initialization parameter for space carving based method	Dolby Intellectual Property Licensing, LLC	Expired
314858-WO-2	Patent Cooperation Treaty	11/20/2017	PCT/US17/62613	WO2018111507		SYSTEM AND METHOD FOR LEAKAGE CURRENT AND FAULT LOCATION DETECTION IN ELECTRIC VEHICLE DC POWER CIRCUITS	Dolby Intellectual Property Licensing, LLC	Expired

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314859-WO-2	Patent Cooperation Treaty	10/20/2017	PCT/US17/57513	WO2018111400		DC LEAKAGE CURRENT DETECTOR AND METHOD OF OPERATION THEREOF FOR LEAKAGE CURRENT DETECTION IN DC POWER CIRCUITS	Dolby Intellectual Property Licensing, LLC	Expired
315022-EP-2	European Patent	12/15/2017	17207600.2	EP3336483		DIGITAL WIRELESS FEELER GAUGE	Dolby Intellectual Property Licensing, LLC	Expired
315022-CN-3	China	12/15/2017	2.01711E+11	CN108225199		DIGITAL WIRELESS FEELER GAUGE	Dolby Intellectual Property Licensing, LLC	Expired
315117-WO-2	Patent Cooperation Treaty	10/28/2017	PCT/US17/58907	WO2018111421		CHARGING PADS AND METHODS FOR CHARGING RECEIVER DEVICES HAVING DIFFERENT FREQUENCY STANDARDS	Dolby Intellectual Property Licensing, LLC	Expired
315233-US-1	United States of America	10/27/2016	62/413684			METHODS OF SYSTEMS OF GENERATING VIRTUAL MULTI-DIMENSIONAL MODELS USING IMAGE ANALYSIS	Dolby Intellectual Property Licensing, LLC	Expired
315233-WO-3	Patent Cooperation Treaty	10/27/2017	PCT/US2017/58825	WO2018081607		Methods for using synthetic data in deep-learning-based image analysis	Dolby Intellectual Property Licensing, LLC	Expired
315343A-WO-2	Patent Cooperation Treaty	1/12/2018	PCT/US2018/013499			SYSTEM AND METHOD FOR PREDICTING AN EXCITATION PATTERN OF A DEEP BRAIN STIMULATION	Dolby Intellectual Property Licensing, LLC	Expired
315343-WO-2	Patent Cooperation Treaty	1/12/2018	PCT/US2018/013498			SYSTEM AND METHOD FOR PREDICTING AN EXCITATION PATTERN OF A DEEP BRAIN STIMULATION	Dolby Intellectual Property Licensing, LLC	Expired
315659-WO-2	Patent Cooperation Treaty	10/27/2017	PCT/US2017/058641	WO2018111416		A CHARGING PAD AND A METHOD FOR CHARGING ONE OR MORE RECEIVER DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
316496-EP-2	European Patent	12/1/2017	17204871.2	EP3333764		TECHNIQUES FOR ASSESSING GROUP LEVEL COGNITIVE STATES	Dolby Intellectual Property Licensing, LLC	Expired
316496-JP-3	Japan	11/22/2017	2017-224121			TECHNIQUES FOR ASSESSING GROUP LEVEL COGNITIVE STATES	Dolby Intellectual Property Licensing, LLC	Expired
316496-CN-4	China	12/6/2017	2.01711E+11	CN108154236		TECHNIQUES FOR ASSESSING GROUP LEVEL COGNITIVE STATES	Dolby Intellectual Property Licensing, LLC	Expired
316496-CA-5	Canada	11/22/2017	2986406			TECHNIQUES FOR ASSESSING GROUP LEVEL COGNITIVE STATES	Dolby Intellectual Property Licensing, LLC	Expired
316767-WO-2	Patent Cooperation Treaty	2/6/2018	PCT/US18/16964	WO2018/160324		DRIVE SYSTEM AND METHOD OF OPERATION THEREOF FOR REDUCING DC LINK CURRENT RIPPLE	Dolby Intellectual Property Licensing, LLC	Expired
316772-WO-2	Patent Cooperation Treaty	3/16/2018	PCT/US2018/022999	WO2018212828		DUAL MAGNETIC PHASE MATERIAL RINGS FOR AC ELECTRIC MACHINES	Dolby Intellectual Property Licensing, LLC	Expired
317124-EP-2	European Patent	10/2/2017	17194461.4	EP3333762		CROWD ANALYTICS VIA ONE SHOT LEARNING	Dolby Intellectual Property Licensing, LLC	Expired
317124-JP-3	Japan	9/25/2017	2017-183113			CROWD ANALYTICS VIA ONE SHOT LEARNING	Dolby Intellectual Property Licensing, LLC	Expired
317124-CN-4	China	10/9/2017	2.01711E+11	CN108154075		CROWD ANALYTICS VIA ONE SHOT LEARNING	Dolby Intellectual Property Licensing, LLC	Expired
317124-CA-5	Canada	9/28/2017	2980609			CROWD ANALYTICS VIA ONE SHOT LEARNING	Dolby Intellectual Property Licensing, LLC	Expired

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317707-WO-3	Patent Cooperation Treaty	8/9/2018	PCT/US2018/045888	WO/2019/060055		GREEN-EMITTING PHOSPHORS AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
317707-TW-11	Taiwan	9/6/2018	111103044	TW202235580		GREEN-EMITTING PHOSPHORS AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
318182-WO-2	Patent Cooperation Treaty	8/22/2018	PCT/US2018/047432	WO2019/040565		SYSTEM AND METHOD FOR RAPID CURRENT SENSING AND TRANSISTOR TIMING CONTROL	Dolby Intellectual Property Licensing, LLC	Expired
318542-WO-1	Patent Cooperation Treaty	8/31/2017	PCT/US2017/049682	WO/2019/045737		ENCODING VOLUMETRIC DATA TO SUPPORT TRUSTED TRANSACTION DELIVERY	Dolby Intellectual Property Licensing, LLC	Expired
318543-WO-1	Patent Cooperation Treaty	8/31/2017	PCT/US17/049685	WO/2019/045738		INTELLECTUAL PROPERTY EXCHANGE ECOSYSTEM FOR ADDITIVE MANUFACTURING	Dolby Intellectual Property Licensing, LLC	Expired
318580-WO-1	Patent Cooperation Treaty	8/31/2017	PCT/US2017/049677	WO/2019/045735		DISTRIBUTION OF CUSTOMIZED ENGINEERING MODELS FOR ADDITIVE MANUFACTURING	Dolby Intellectual Property Licensing, LLC	Expired
318587-WO-1	Patent Cooperation Treaty	8/31/2017	PCT/US17/049695	WO/2019/045739		BLOCKCHAIN ENABLED COLLABORATIVE TRANSACTION INFORMATION PROCESSING FOR A SUPPLY CHAIN	Dolby Intellectual Property Licensing, LLC	Expired
318587-KR-5	Korea, Republic of (KR)	8/31/2017	10-2020-7008969			BLOCKCHAIN ENABLED COLLABORATIVE TRANSACTION INFORMATION PROCESSING FOR A SUPPLY CHAIN	Dolby Intellectual Property Licensing, LLC	Expired
318738-US-1	United States of America	3/27/2017	62/477151			Inductive Electric Vehicle Charger	Dolby Intellectual Property Licensing, LLC	Expired
318738-WO-3	Patent Cooperation Treaty	3/22/2018	PCT/US18/23782	WO/2018/183083		SYSTEM AND METHOD FOR INDUCTIVE CHARGING WITH IMPROVED EFFICIENCY	Dolby Intellectual Property Licensing, LLC	Expired
318763-CN-1	China	1/2/2018	2.0181E+11	CN109995240A		POWER CONVERTER AND POWER CONVERTING METHOD	Dolby Intellectual Property Licensing, LLC	Expired
319318-WO-2	Patent Cooperation Treaty	4/19/2018	PCT/US2018/028229	WO/2018/217336		A POWER TRANSFER DEVICE AND AN ASSOCIATED METHOD THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
319319-WO-2	Patent Cooperation Treaty	5/21/2018	PCT/US18/33652	WO/2018/222429		TRANSMITTING ASSEMBLY FOR A UNIVERSAL WIRELESS CHARGING DEVICE AND A METHOD THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
319335-US-1	United States of America	7/6/2017	62/529,165			ARTICLES FOR HIGH TEMPERATURE SERVICE AND RELATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
319335-WO-3	Patent Cooperation Treaty	6/11/2018	PCT/US18/36899	WO/2019/009984		ARTICLES FOR HIGH TEMPERATURE SERVICE AND RELATED METHOD	Dolby Intellectual Property Licensing, LLC	Expired
319620-WO-2	Patent Cooperation Treaty	8/21/2018	PCT/US18/47167	WO/2019/074580		TRUE TIME DELAY BEAM FORMER MODULE AND METHOD OF MAKING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
319621-WO-2	Patent Cooperation Treaty	7/5/2018	PCT/US2018/040914	WO/2019/078933		TRUE TIME DELAY BEAM FORMER AND METHOD OF OPERATION	Dolby Intellectual Property Licensing, LLC	Expired

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319639-WO-2	Patent Cooperation Treaty	8/27/2018	PCT/US18/48090	WO/2019/078952		HIGH IMPEDANCE RF MEMS TRANSMISSION DEVICES AND METHOD OF MAKING THE SAME	Dolby Intellectual Property Licensing, LLC	Expired
319927-WO-2	Patent Cooperation Treaty	9/14/2018	PCT/US2018/050984	WO/2019/083636		SYSTEM AND METHOD FOR PREVENTING PERMANENT MAGNET DEMAGNETIZATION IN ELECTRICAL MACHINES	Dolby Intellectual Property Licensing, LLC	Expired
319927-KR-6	Korea, Republic of (KR)	9/14/2018	10-2020-7014544			SYSTEM AND METHOD FOR PREVENTING PERMANENT MAGNET DEMAGNETIZATION IN ELECTRICAL MACHINES	Dolby Intellectual Property Licensing, LLC	Expired
320002-WO-2	Patent Cooperation Treaty	11/13/2018	PCT/US18/60589	WO/2019/099335		HIERARCHICAL DATA EXCHANGE MANAGEMENT SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
320128-US-1	United States of America	4/24/2017	62/488990			ADAPTIVE LINEAR LINKED PISTON ELECTRIC POWER GENERATOR	Dolby Intellectual Property Licensing, LLC	Expired
320128-WO-2	Patent Cooperation Treaty	4/23/2018	PCT/US2018/028828	WO2018200367		ADAPTIVE LINEAR LINKED PISTON ELECTRIC POWER GENERATOR	Dolby Intellectual Property Licensing, LLC	Expired
320128-EP-10	European Patent	4/23/2018	22163067.6	EP4063628		ADAPTIVE LINEAR LINKED PISTON ELECTRIC POWER GENERATOR	Dolby Intellectual Property Licensing, LLC	Expired
320529-WO-2	Patent Cooperation Treaty	3/18/2021	PCT/US2021/23009	WO/2021/188822		Analogy Engines for Grounding and Situational Awareness	Dolby Intellectual Property Licensing, LLC	Expired
320880-WO-2	Patent Cooperation Treaty	3/4/2019	PCT/US2019/020517	WO/2019/173197		SYSTEMS AND METHODS FOR WEARABLE VOLTAGE DETECTION DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
322985-WO-2	Patent Cooperation Treaty	2/25/2019	PCT/US19/19398	WO/2019/177764		INDUSTRIAL DATA VERIFICATION USING SECURE, DISTRIBUTED LEDGER	Dolby Intellectual Property Licensing, LLC	Expired
323537-WO-2	Patent Cooperation Treaty	2/20/2019	PCT/US2019/018747	WO/2019/164928		SYSTEM AND METHOD FOR ELECTRIC PULSE BASED ACTIVATION OF BIOLOGICAL SAMPLES	Dolby Intellectual Property Licensing, LLC	Expired
323953-WO-2	Patent Cooperation Treaty	2/19/2019	PCT/US2019/018455			SYSTEM AND METHOD FOR LOCALIZATION OF DEEP BRAIN STIMULATION ELECTRODE VIA MAGNETIC RESONANCE IMAGING	Dolby Intellectual Property Licensing, LLC	Expired
324595-WO-2	Patent Cooperation Treaty	1/15/2020	PCT/US2020/013585	WO/2020/154137		SYSTEMS AND METHODS FOR PREDICTING OPTIMAL DEEP BRAINSTIMULATION PARAMETERS	Dolby Intellectual Property Licensing, LLC	Expired
324680-WO-2	Patent Cooperation Treaty	9/25/2019	PCT/US2019/052938	WO/2020/068969		SYSTEM AND METHOD FOR A MAGNETICALLY COUPLED INDUCTOR BOOST AND MULTIPHASE BUCK CONVERTER WITH SPLIT DUTY CYCLE	Dolby Intellectual Property Licensing, LLC	Expired
324828-US-1	United States of America	11/28/2018	62/772,130			SYSTEM AND METHOD FOR SENSORLESS CONTROL OF ELECTRIC MACHINES AND REDUCTION OF NOISE AND VIBRATION ASSOCIATED THEREWITH	Dolby Intellectual Property Licensing, LLC	Expired

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
324845-WO-3	Patent Cooperation Treaty	3/22/2019	PCT/US2019/023548	WO/2019/203990		RECEIVER UNIT OF A WIRELESS POWER TRANSFER SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
326309-WO-2	Patent Cooperation Treaty	1/14/2020	PCT/US2020/013486	WO/2020/154133		BRAIN CONNECTIVITY ATLAS FOR PERSONALIZED FUNCTIONALNEUROSURGERY TARGETING AND BRAIN STIMULATION PROGRAMMING	Joint ownership - Dolby Intellectual Property Licensing, LLC and University Health Network	Expired
502201-WO-2	Patent Cooperation Treaty	4/20/2020	PCT/US2020/028946	WO/2020/236374		METHOD TO ENHANCE PHOSPHOR ROBUSTNESS AND DISPERSABILITY AND RESULTING PHOSPHORS	Dolby Intellectual Property Licensing, LLC	Expired
502615-WO-2	Patent Cooperation Treaty	1/15/2020	PCT/US2020/013589	WO/2020/154138		Automatic optimization of Deep Brain Stimulation parameters using functional MRI	Joint ownership - Dolby Intellectual Property Licensing, LLC and Albany Medical College	Expired
508774-US-1	United States of America	12/9/2019	62/945,830			LIGHT EMITTING DEVICES AND DISPLAYS WITH EXPANDED GAMUT COVERAGE AND LOW BLUE LIGHT EMISSION AND METHODS FOR PRODUCING	Dolby Intellectual Property Licensing, LLC	Expired
508774-WO-2	Patent Cooperation Treaty	12/9/2020	PCT/US2020/063925	WO/2021/119073		LIGHT EMITTING DEVICES AND DISPLAYS WITH EXPANDED GAMUT COVERAGE AND LOW BLUE LIGHT EMISSION AND METHODS FOR PRODUCING	Dolby Intellectual Property Licensing, LLC	Expired
509591-US-1	United States of America	5/20/2020	63/027,672			INK FORMULATIONS WITH NARROW BAND EMITTING PHOSPHOR MATERIALS	Dolby Intellectual Property Licensing, LLC	Expired
509591-US-2	United States of America	7/31/2020	63/059,709			INK FORMULATIONS WITH NARROW BAND EMITTING PHOSPHOR MATERIALS	Dolby Intellectual Property Licensing, LLC	Expired
509591-WO-3	Patent Cooperation Treaty	1/19/2021	PCT/US2021/013963	WO/2021/211181		INK FORMULATIONS WITH NARROW BAND EMITTING PHOSPHOR MATERIALS	Dolby Intellectual Property Licensing, LLC	Expired
509730-US-1	United States of America	4/14/2020	63/009,800			GREEN-EMITTING PHOSPHORS AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
509730-US-3	United States of America	9/1/2020	63/073,391			GREEN-EMITTING PHOSPHORS AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
509730-WO-4	Patent Cooperation Treaty	4/13/2021	PCT/US2021/027105	WO/2021/211600		GREEN-EMITTING PHOSPHORS AND DEVICES THEREOF	Dolby Intellectual Property Licensing, LLC	Expired
509746-WO-2	Patent Cooperation Treaty	7/16/2021	PCT/US2021/042085	WO/2022/020213		POWER CONTROLLER IN A WIRELESS POWER RECEPTION APPARATUS	Dolby Intellectual Property Licensing, LLC	Expired
602226-WO-2	Patent Cooperation Treaty	12/8/2021	PCT/US2021/062377	WO 2022/125644		PULSE WIDTH COMMUNICATION IN A WIRELESS POWER SYSTEM	Dolby Intellectual Property Licensing, LLC	Expired
602751-US-1	United States of America	9/1/2020	63/073,386			DEVICES COMPATIBLE WITH NIGHT VISION EQUIPMENT	Dolby Intellectual Property Licensing, LLC	Expired

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
602751-WO-2	Patent Cooperation Treaty	8/31/2021	PCT/US2021/048535	WO/2022/051302		DEVICES COMPATIBLE WITH NIGHT VISION EQUIPMENT	Dolby Intellectual Property Licensing, LLC	Expired
605665-US-1	United States of America	10/8/2021	63/254,021			URANIUM-BASED PHOSPHORS AND COMPOSITIONS FOR DISPLAYS AND LIGHTING APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Expired
605665-WO-2	Patent Cooperation Treaty	4/13/2022	PCT/US2022/024577	WO/2022/221385		URANIUM-BASED PHOSPHORS AND COMPOSITIONS FOR DISPLAYS AND LIGHTING APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Expired
607693-US-1	United States of America	5/5/2022	63/338,868			PRINTING, FILMS AND SUBSTRATES	Dolby Intellectual Property Licensing, LLC	Expired
RD27644-US-1	United States of America	11/1/1999	60/162901			ACTIVE VIRTUAL NETWORK MANAGEMENT PREDICTION	Dolby Intellectual Property Licensing, LLC	Expired
RD28356-EP-2	European Patent	2/26/2007	7751816.5	EP1999230	6/13/2012	RED EMITTING PHOSPHOR MATERIALS FOR USE IN LED AND LCD APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Expired
RD28356-WO-7	Patent Cooperation Treaty	2/26/2007	PCT/US2007/005083			RED LINE EMITTING PHOSPHORS FOR USE IN LED APPLICATIONS	Dolby Intellectual Property Licensing, LLC	Expired
604111-US-1	United States of America	3/31/2022	63/325,736			SAFETY AND SECURITY OF CYBER-PHYSICAL SYSTEMS CONNECTED	Dolby Intellectual Property Licensing, LLC	Expired
604111-US-2	United States of America	3/24/2022	63/323,241			SAFETY AND SECURITY OF CYBER-PHYSICAL SYSTEMS CONNECTED THROUGH IOT NETWORK	Dolby Intellectual Property Licensing, LLC	Expired
508927-WO-2	Patent Cooperation Treaty	9/20/2022	PCT/US2022/076711	WO 2023/044499		Systems and Methods for Node Selection and Ranking in Cyber-Physical Systems	Dolby Intellectual Property Licensing, LLC	Expired
606915-US-1	United States of America	5/23/2022	63/344,711			Distributed Anomaly Detection and Localization for Cyber-Physical Systems	Dolby Intellectual Property Licensing, LLC	Expired
607309-US-1	United States of America	9/9/2022	63/375,205			System and Method for Power Grid Sensing	Dolby Intellectual Property Licensing, LLC	Expired
607309-US-3	United States of America	6/2/2023	63/506,031			System and Method for Power Grid Sensing	Dolby Intellectual Property Licensing, LLC	Expired
607309-US-4	United States of America	6/15/2023	63/508,357			System and Method for Power Grid Sensing	Dolby Intellectual Property Licensing, LLC	Expired
602905-WO-2	Patent Cooperation Treaty	8/19/2022	PCT/US2022/075196	WO/2023/023637		Systems and Methods for Cyber-Fault Detection	Dolby Intellectual Property Licensing, LLC	Expired
602922-WO-2	Patent Cooperation Treaty	8/19/2022	PCT/US2022/75198	WO2023023639		Systems and Methods for Self-Adapting Neutralization Against Cyber-Faults	Dolby Intellectual Property Licensing, LLC	Expired
246663-AU-2	Australia	6/25/2012	2012203684			ELECTRICAL SUBSTATION FAULT MONITORING AND DIAGNOSTICS	Dolby Intellectual Property Licensing, LLC	Expired

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
246663-BR-3	Brazil	6/26/2012	BR102012015 7942			ELECTRICAL SUBSTATION FAULT MONITORING AND DIAGNOSTICS	Dolby Intellectual Property Licensing, LLC	Expired
246663-CA-4	Canada	6/21/2012	2780604			ELECTRICAL SUBSTATION FAULT MONITORING AND DIAGNOSTICS	Dolby Intellectual Property Licensing, LLC	Expired
246663-DE-5	Germany (Federal Republic of)	6/21/2012	1.02012E+11	DE10201210 541		ELECTRICAL SUBSTATION FAULT MONITORING AND DIAGNOSTICS	Dolby Intellectual Property Licensing, LLC	Expired
246663-GB-6	United Kingdom	6/21/2012	1210969	GB2492456		ELECTRICAL SUBSTATION FAULT MONITORING AND DIAGNOSTICS	Dolby Intellectual Property Licensing, LLC	Expired
246663-JP-7	Japan	6/25/2012	2012-141562	JP20130130 75		ELECTRICAL SUBSTATION FAULT MONITORING AND DIAGNOSTICS	Dolby Intellectual Property Licensing, LLC	Expired
246663-NZ-8	New Zealand	6/25/2012	600876	NZ600876	5/1/2014	ELECTRICAL SUBSTATION FAULT MONITORING AND DIAGNOSTICS	Dolby Intellectual Property Licensing, LLC	Expired
246941-US-1	United States of America	8/17/2010	61/374431			COMPACT LED LIGHT ENGINE WITH REFLECTOR CUPS AND HIGHLY DIRECTIONAL LAMPS USING SAME	Dolby Intellectual Property Licensing, LLC	Expired
246941-WO-3	Patent Cooperation Treaty	6/7/2011	US11/39392	WO12/24011		COMPACT LED LIGHT ENGINE WITH REFLECTOR CUPS AND HIGHLY DIRECTIONAL LAMPS USING SAME	Dolby Intellectual Property Licensing, LLC	Expired
307094-GB-1	United Kingdom	11/19/2009	920237.5	GB2475495	10/12/2011	FUEL CELL SYSTEM AND OPERATING METHOD	Dolby Intellectual Property Licensing, LLC	Expired
307094-FR-2	France	11/15/2010	10014618.2	FR2325934	7/10/2013	FUEL CELL SYSTEM AND OPERATING METHOD	Dolby Intellectual Property Licensing, LLC	Expired
307094-DE-3	Germany (Federal Republic of)	11/15/2010	10014618.2	DE60201000 8331.4	7/10/2013	FUEL CELL SYSTEM AND OPERATING METHOD	Dolby Intellectual Property Licensing, LLC	Expired
307094-IT-4	Italy	11/15/2010	10014618.2	IT201390219 5315	7/10/2013	FUEL CELL SYSTEM AND OPERATING METHOD	Dolby Intellectual Property Licensing, LLC	Expired
307094-CH-5	Switzerland	11/15/2010	10014618.2	CH2325934	7/10/2013	FUEL CELL SYSTEM AND OPERATING METHOD	Dolby Intellectual Property Licensing, LLC	Expired
307094-EP-6	European Patent	11/15/2010	10014618.2	EP2325934	7/10/2013	FUEL CELL SYSTEM AND OPERATING METHOD	Dolby Intellectual Property Licensing, LLC	Expired
307094-US-8	United States of America	5/29/2015	14/725467	US20150263 365		FUEL CELL SYSTEM AND OPERATING METHOD	Dolby Intellectual Property Licensing, LLC	Expired
315132-US-1	United States of America	10/8/2007	60/978364			SYSTEM AND METHODS FOR AUTOMATED GRAMMAR BASED FAULT DISCOVERY AND ISOLATION	Dolby Intellectual Property Licensing, LLC	Expired
315132-US-2	United States of America	7/1/2008	61/077458			AUTOMATIC GRAMMAR BASED FAULT DETECTION AND ISOLATION	Dolby Intellectual Property Licensing, LLC	Expired
315132-WO-4	Patent Cooperation Treaty	10/8/2008	PCT/CA2008/ 001785	WO2009046 525		AUTOMATIC GRAMMAR BASED FAULT DETECTION AND ISOLATION	Dolby Intellectual Property Licensing, LLC	Expired
315166-US-1	United States of America	2/27/2008	61/032043			SYSTEM AND METHODS FOR AUTOMATED GRAMMAR BASED TEST PLANNING	Dolby Intellectual Property Licensing, LLC	Expired

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
315166-WO-3	Patent Cooperation Treaty	2/27/2009	PCT/CA2009/000232	WO2009105883		SYSTEM AND METHOD FOR GRAMMAR BASED TEST PLANNING	Dolby Intellectual Property Licensing, LLC	Expired
315170-US-1	United States of America	2/27/2008	61/032046			TEST BENCH FOR CONTROL DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
315170-US-2	United States of America	7/1/2008	61/077459			TEST BENCH FOR CONTROL DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
315170-WO-6	Patent Cooperation Treaty	2/27/2009	PCT/CA2009/000239	WO2009105889		TESTING FRAMEWORK FOR CONTROL DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
315170-EP-7	European Patent	2/27/2009	9715372	EP2260385		TESTING FRAMEWORK FOR CONTROL DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
315170-IN-8	India	2/27/2009	5424/CHENP/2010	IN50/2010		TESTING FRAMEWORK FOR CONTROL DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
315170-US-9	United States of America	7/22/2016	15/217,832	US10592369	3/17/2020	TEST BENCH FOR CONTROL DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
610770-KR-1	Korea, Republic of (KR)	8/18/2014	10-2014-0106769	KR10-2016-0021491		Light emitting diode package	Dolby Intellectual Property Licensing, LLC	Expired
610772-WO-5	Patent Cooperation Treaty	1/13/2012	PCT/KR2012/000314	WO/2012/102501		Wafer level LED package and method of fabricating the same	Dolby Intellectual Property Licensing, LLC	Expired
610772-EP-7	European Patent	1/13/2012	12739572.1	EP2669963	8/22/2018	Wafer level LED package and method of fabricating the same	Dolby Intellectual Property Licensing, LLC	Expired
610772-JP-8	Japan	1/13/2012	2013-551891			Wafer level LED package and method of fabricating the same	Dolby Intellectual Property Licensing, LLC	Expired
610772-EP-9	European Patent	1/13/2012	14150304.5	EP2720283	5/16/2018	Wafer level LED package and method of fabricating the same	Dolby Intellectual Property Licensing, LLC	Expired
610773-KR-7	Korea, Republic of (KR)	1/14/2010	10-2010-0003396	KR10-1623950	5/24/2016	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Expired
610773-KR-8	Korea, Republic of (KR)	1/15/2010	10-2010-0003964	KR10-1625127	5/27/2016	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Expired
610773-KR-9	Korea, Republic of (KR)	1/15/2010	10-2010-0003396	KR10-1625130	5/27/2016	Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Expired
610773-WO-20	Patent Cooperation Treaty	12/16/2010	PCT/KR2010/009008	WO/2011/083923		Light emitting diode having electrode pads	Dolby Intellectual Property Licensing, LLC	Expired
149581-US-1	United States of America	4/26/2004	10/831862	US7224000	5/29/2007	LIGHT EMITTING DIODE COMPONENT	Joint ownership - Dolby Intellectual Property Licensing, LLC with Current	Expired
149581-US-2	United States of America	12/20/2005	11/312268	US7800121	9/21/2010	LIGHT EMITTING DIODE COMPONENT	Joint ownership - Dolby Intellectual Property Licensing, LLC with Current	Expired

Patent / Application Reference	Publication Country	File date	Application Number	Patent/ Publication Number	Publication Date	Title	Current Assignee	Status
202972-US-1	United States of America	2/28/2006	11/364611	US7497973	3/3/2009	RED LINE EMITTING PHOSPHOR MATERIALS FOR USE IN LED APPLICATIONS	Joint ownership - Dolby Intellectual Property Licensing, LLC with Current	Expired
315172-US-1	United States of America	8/4/2011	13/198663	US9026394	5/5/2015	TESTING AND MITIGATION FRAMEWORK FOR NETWORKED DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
315172-US-2	United States of America	3/16/2012	13/423004	US9280434 B2	3/8/2016	TESTING AND MITIGATION FRAMEWORK FOR NETWORKED DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
315172-US-3	United States of America	3/7/2016	15/063174	US20160188 433A1		TESTING AND MITIGATION FRAMEWORK FOR NETWORKED DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
315172-WO-4	Patent Cooperation Treaty	8/3/2012	PCT/CA2012/ 000740	WO2013016 814		TESTING AND MITIGATION FRAMEWORK FOR NETWORKED DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
315172-EP-5	European Patent	8/3/2012	12819724.1	EP2740036	3/15/2017	TESTING AND MITIGATION FRAMEWORK FOR NETWORKED DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
315172-IN-6	India	8/3/2012	1329/CHENP/ 2014			TESTING AND MITIGATION FRAMEWORK FOR NETWORKED DEVICES	Dolby Intellectual Property Licensing, LLC	Expired
607692-US-1	United States of America	5/4/2022	63/338,428			Phosphors, Ink Formulations and FilmsPHOSPHORS, INK FORMULATIONS AND FILMS	Dolby Intellectual Property Licensing, LLC	Expired
GE24357DE01	DE	EP1518307 8 3	9/24/2003	EP2711233	11/6/2024	POWER SUPPLY MANAGEMENT APPARATUS AND METHOD THEREOF	Dolby Intellectual Property Licensing, LLC	Active
GE24817TW02	TW					DISPLAYS WITH EXPANDED GAMUT COVERAGE AND LOW BLUE LIGHT EMISSION	Dolby Intellectual Property Licensing, LLC	Not Yet Filed
GE24883TW01	TW					Remote Phosphor films in reflective geometry	Dolby Intellectual Property Licensing, LLC	Not Yet Filed
GE24883WO01	PCT					Remote Phosphor films in reflective geometry	Dolby Intellectual Property Licensing, LLC	Not Yet Filed

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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: EDISON INNOVATIONS, LLC

Application No./Patent No.: 9,800,182 Filed/Issue Date: 10/24/2017

Titled: Electric Drive System and Energy Management Method

EDISON INNOVATIONS, LLC, a company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

B. ☑ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: ZHOU, JIAN; et al. To: GENERAL ELECTRIC COMPANY

   The document was recorded in the United States Patent and Trademark Office at

   Reel 032484, Frame 0482, or for which a copy thereof is attached.

2. From: GENERAL ELECTRIC COMPANY To: GE INTELLECTUAL PROPERTY LICENSING, LLC

   The document was recorded in the United States Patent and Trademark Office at

   Reel 070636, Frame 0815, or for which a copy thereof is attached.

This collectionof information is required by 37CFR 3.73(b). The informationis required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application.Confidentiality isgoverned by 35U.S.C. 122 and37 CFR 1.11and 1.14.This collection is estimated to take 12 minutes to complete, including gathering,preparing, and submitting the completed applicationform to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should besent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETEDFORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA22313-1450** .

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STATEMENT UNDER 37 CFR 3.73(c)

3. From: GE INTELLECTUAL PROPERTY LICENSING, LLC To: DOLBY INTELLECTUAL PROPERTY LICENSING, LLC

The document was recorded in the United States Patent and Trademark Office at
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4. From: DOLBY INTELLECTUAL PROPERTY LICENSING, LLC To: EDISON INNOVATIONS, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 070293, Frame 0273, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
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6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Tarek N. Fahmi/	2025-07-15
Signature	Date
Tarek N. Fahmi	41402
Printed or Typed Name	Title or Registration Number

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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5. Arecord related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further,a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. Arecord from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

To: gpo.mail@ge.com,gedocket@meagheremanuel.com,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 131278

Oct 05, 2017 03:45:54 AM

Dear PAIR Customer:

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 131278 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
14094086	ISSUE.NTF	10/04/2017	256975-2

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	10/24/2017	9800182	256975-2	1896

131278 7590 10/04/2017

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 575 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

General Electric Company, Schenectady, NY;
Jian Zhou, Shanghai, CHINA;
Fei Xu, Shanghai, CHINA;
Dong Liu, Shanghai, CHINA;
Hai Qiu, Shanghai, CHINA;
Pengju Kang, Yorktown Heights, NY;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

To: gpo.mail@ge.com,gedocket@meagheremanuel.com,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 131278

Sep 20, 2017 03:55:28 AM

Dear PAIR Customer:

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
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UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 131278 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

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Application	Document	Mailroom Date	Attorney Docket No.
14094086	NOA	09/20/2017	256975-2
	1449	09/20/2017	256975-2

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PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

131278 7590 09/20/2017

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851

EXAMINER
CHAN, KAWING

ART UNIT	PAPER NUMBER
2837	

NOTIFICATION DATE	DELIVERY MODE
09/20/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gpo.mail@ge.com
gedocket@meagheremanuel.com

Corrected Notice of Allowability	Application No. 14/094,086	Applicant(s) ZHOU ET AL.	
	Examiner KAWING CHAN	Art Unit 2837	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *IDS filed 09/01/2017*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-7,10,11,13,15-20 and 22-24*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☒ All b) ☐ Some *c) ☐ None of the:
   1. ☒ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 09/01/2017
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/KAWING CHAN/
Primary Examiner, Art Unit 2837

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8395355	B2	2013-03-12	Kaita et al.	
	2	8469849	B2	2013-06-25	Kruger	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.C/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/KAWING CHAN/	Date Considered	09/18/2017

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.C/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2017-09-01
Name/Print	Craig M. Drachtman	Registration Number	73,016

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.C/

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.C/

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

131278 7590 06/09/2017
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GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851

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Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

EFS WEB	(Depositor's name)
	(Signature)
	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

TITLE OF INVENTION: Electric Drive System and Energy Management Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$960	$960	09/11/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHAN, KAWING	2837	318-500000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Meagher Emanuel Laks
2 Goldberg & Liao, LLP
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: GENERAL ELECTRIC COMPANY

(B) RESIDENCE: (CITY and STATE OR COUNTRY): SCHENECTADY, NEW YORK

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed. *Issue Fee previously paid 3/20/17 Request to reapply submitted herewith
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Craig M. Drachtman/ Date 2017-09-01

Typed or printed name Craig M. Drachtman Registration No. 73016

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of: Jian Zhou et al. **Application No.:** 14/094,086 **Confirmation No.:** 1896 **Filed:** December 2, 2013 **For:** Electric Drive System and Energy Management Method **Group:** 2837 **Examiner:** CHAN, KAWING	Our File: 256975-2 Date: September 1, 2017

REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Request is being filed in response to the Notice of Allowance and Issue Fees Due dated June 9, 2017.

The Issue Fee noted in the Notice has been previously paid by the Applicant on March 20, 2017. A copy of the previously paid Issue Fee Transmittal, Electronic Patent Application Fee Transmittal and Electronic Acknowledgement Receipt are submitted herewith.

Applicant believes that no additional fees are due. However, should any fees be due, the Commissioner is hereby authorized to charge any fees in connection with this application and to credit any overpayments to Deposit Account No. 09-0470.

Respectfully submitted,
Jian Zhou et al.

By: /Craig M. Drachtman/
Craig M. Drachtman
Registration No. 73,016

Meagher Emanuel
Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542
609-454-3500

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 156

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

131278 7590 01/05/2017
GE Ventures- Licensing
C/O Meagher Emanuel Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

EFS WEB (Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

TITLE OF INVENTION: Electric Drive System and Energy Management Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	04/05/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHAN, KAWING	2837	318-500000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Meagher Emanuel Laks
2 Goldberg & Liao, LLP
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: GENERAL ELECTRIC COMPANY

(B) RESIDENCE: (CITY and STATE OR COUNTRY): SCHENECTADY, NEW YORK

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 090470 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Craig Michael Drachtman/ Date 2017-03-16

Typed or printed name CRAIG MICHAEL DRACHTMAN Registration No. 73,016

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

Electronic Patent Application Fee Transmittal

Application Number:	14094086
Filing Date:	02-Dec-2013
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Filer:	Craig Michael Drachtman/Silvia Mannes
Attorney Docket Number:	256975-2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	960

Electronic Acknowledgement Receipt

EFS ID:	28674727
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Craig Michael Drachtman/Silvia Mannes
Filer Authorized By:	Craig Michael Drachtman
Attorney Docket Number:	256975-2
Receipt Date:	20-MAR-2017
Filing Date:	02-DEC-2013
Time Stamp:	12:33:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$960
RAM confirmation Number	032017INTEFSW00011429090470
Deposit Account	090470
Authorized User	Silvia Mannes

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	256975-2-IssueFee.pdf	1584284 1be85332482bbac1344f45a13c68274985b1ee25	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30227 47ce680e96148a9a592c7e3dc518cc481ddcf37d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1614511		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
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Electronic Acknowledgement Receipt

EFS ID:	30254735
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Craig Michael Drachtman/Silvia Mannes
Filer Authorized By:	Craig Michael Drachtman
Attorney Docket Number:	256975-2
Receipt Date:	01-SEP-2017
Filing Date:	02-DEC-2013
Time Stamp:	15:00:43
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	256975-2-IssueFeeTransmittal.pdf	1611117 3d56f6333f31a91b3b03854d11152283b41bba75	no	1

Warnings:

Information:					
2	Miscellaneous Incoming Letter	256975-2-ReqReapplyIssueFee.pdf	4346524 c557e3f3f68c9b4d0d0013f9553ad9eb40262507	no	7
Warnings:					
Information:					
			Total Files Size (in bytes):	5957641	

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172

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

OPAP AKIMA-5 SEP 01 2017 PATENT & TRADEMARK OFFICE

131278 7590 06/09/2017
GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

EFS WEB	(Depositor's name)
	(Signature)
	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

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nonprovisional	UNDISCOUNTED	$960	$0	$960	$960	09/11/2017

09/05/2017 CCHAU2 00000006 090470 14094086

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHAN, KAWING	2837	318-500000

01 FC:1501 960.00 DA

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(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Meagher Emanuel Laks
2 Goldberg & Liao, LLP
3

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ADJUSTMENT DATE: 09/05/2017 CCHAU2

(A) NAME OF ASSIGNEE: GENERAL ELECTRIC COMPANY

(B) RESIDENCE: (CITY and STATE OR COUNTRY): SCHENECTADY, NEW YORK

03/20/2017 INTEFSW 00011429 090470 14094086
01 FC:1501 960.00 CR

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed. *Issue Fee previously paid 3/20/17 Request to reapply
☐ Payment by credit card. Form PTO-2038 is attached. submitted herewith
☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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☐ Applicant certifying micro entity status. See 37 CFR 1.29
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NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Craig M. Drachtman/ Date 2017-09-01
Typed or printed name Craig M. Drachtman Registration No. 73016

Toyota Motor Corp. v. Bunker Hill Technologies LLC
IPR 2026-00333 BHILL Ex. 2004
Page 164

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8395355	B2	2013-03-12	Kaita et al.	
	2	8469849	B2	2013-06-25	Kruger	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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NON-PATENT LITERATURE DOCUMENTS Remove

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou
	Art Unit	2837
	Examiner Name	CHAN, KAWING
	Attorney Docket Number	256975-2

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou
	Art Unit	2837
	Examiner Name	CHAN, KAWING
	Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2017-09-01
Name/Print	Craig M. Drachtman	Registration Number	73,016

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	14094086
Filing Date:	02-Dec-2013
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Filer:	Craig Michael Drachtman/Colleen Maroney
Attorney Docket Number:	256975-2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	30249160
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Craig Michael Drachtman/Colleen Maroney
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Attorney Docket Number:	256975-2
Receipt Date:	01-SEP-2017
Filing Date:	02-DEC-2013
Time Stamp:	10:27:41
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$180
RAM confirmation Number	090117INTEFSW00008720090470
Deposit Account	090470
Authorized User	Colleen Maroney

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37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	256975_2_IDS.pdf	1035114 a1c35a74bc00e29350ce3bb2002e4a5907ddb697	no	4
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	29998 2645562b42c9572b2ac8120b87f36ccdc98eaee1	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1065112		

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Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	30197743
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Thomas F. Meagher/Colleen Maroney
Filer Authorized By:	Thomas F. Meagher
Attorney Docket Number:	256975-2
Receipt Date:	28-AUG-2017
Filing Date:	02-DEC-2013
Time Stamp:	13:36:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$180
RAM confirmation Number	082817INTEFSW00011394090470
Deposit Account	090470
Authorized User	Colleen Maroney

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Fee Worksheet (SB06)	fee-info.pdf	30051 58e849fc1d3e9f8c177df405aad517bb99fefab5	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	30051		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

To: gpo.mail@ge.com,gedocket@meagheremanuel.com,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 131278

Jul 07, 2017 04:22:22 AM

Dear PAIR Customer:

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 131278 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
14094086	M327	07/05/2017	256975-2

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

7590 07/05/2017

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851

EXAMINER	
CHAN, KAWING	

ART UNIT	PAPER NUMBER
2837	

NOTIFICATION DATE	DELIVERY MODE
07/05/2017	ELECTRONIC

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 6/13/2017 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

☐ The IDS lacks a statement as specified in 37 CFR 1.97(e).

☒ The IDS lacks the fee set forth in 37 CFR 1.17(p).

☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

571-272-4200 or 1-888-786-0101
Application Assistance Unit
Office of Data Management

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 178

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6118237	A	2000-09-12	Kikuchi et al.	
	2	7594491	B2	2009-09-29	Yanagida et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou
	Art Unit	2837
	Examiner Name	CHAN, KAWING
	Attorney Docket Number	256975-2

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou
	Art Unit	2837
	Examiner Name	CHAN, KAWING
	Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2017-06-13
Name/Print	Craig M. Drachtman	Registration Number	73,016

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	29482181
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Craig Michael Drachtman/Colleen Maroney
Filer Authorized By:	Craig Michael Drachtman
Attorney Docket Number:	256975-2
Receipt Date:	13-JUN-2017
Filing Date:	02-DEC-2013
Time Stamp:	15:27:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	256975_2_IDS.pdf	1035156 5d6cec87d3683f0eb87caf8b5515426148 05bae2	no	4

Warnings:

Information:	
Total Files Size (in bytes):	1035156

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

131278 7590 06/09/2017

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851

EXAMINER
CHAN, KAWING

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 06/09/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

TITLE OF INVENTION: Electric Drive System and Energy Management Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$960	$960	09/11/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 185

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

131278 7590 06/09/2017
GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

TITLE OF INVENTION: Electric Drive System and Energy Management Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$960	$960	09/11/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHAN, KAWING	2837	318-500000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

131278 7590 06/09/2017

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851

EXAMINER	
CHAN, KAWING	
ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 06/09/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 187

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/094,086	Applicant(s) ZHOU ET AL.	
	Examiner KAWING CHAN	Art Unit 2837	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *RCE filed 05/19/2017*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-7,10,11,13,15-20 and 22-24*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☒ All b) ☐ Some *c) ☐ None of the:
   1. ☒ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 05/19/2017 and 06/02/2017
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☒ Other *Detailed Action form*.

/KAWING CHAN/
Primary Examiner, Art Unit 2837

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/19/2017 has been entered.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 05/19/2017 and 06/02/2017 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Allowable Subject Matter

4. Claims 1-7, 10-11, 13, 15-20 and 22-24 are allowed.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAWING CHAN whose telephone number is (571)270-3909. The examiner can normally be reached on Mon-Fri 9am-5pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shawki S. Ismail can be reached on 571-272-3985. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KAWING CHAN/
Primary Examiner, Art Unit 2837

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6271648	B1	2001-08-07	Miller	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.C/

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Attorney Docket Number	256975-2

	1	

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EXAMINER SIGNATURE

Examiner Signature	/KAWING CHAN/	Date Considered	06/05/2017

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

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Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2017-06-02
Name/Print	Craig M. Drachtman	Registration Number	73,016

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

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IPR 2026-00333 BHILL Ex. 2004

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
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Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5343970		1994-09-06	Severinsky	
	2	6209672	B1	2001-04-03	Severinsky	
	3	6554088	B2	2003-04-29	Severinsky et al.	
	4	6583599	B1	2003-06-24	Phillips et al.	
	5	8535200	B2	2013-09-17	Vyas et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20080197810	A1	2008-08-21	Ishikawa et al.	

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	2	20090115375	A1	2009-05-07	Iida	
	3	20100240491	A1	2010-09-23	Vyas et al.	

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	1	200023313	JP		2000-01-21	Suzuki Motor Corporation		

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	PCED enUSA 2010 Fusion Milan Hybrid, Description and Operation, pages 1-121.	
	2	Hybrid/Battery Control: Hybrid Control System: Details (2010 Prius PHV), 9-23-2011, https://techinfo.toyota.com/t3Portal/resources/jsp/siviewer/index.jsp?dir=ncf/NM14C0U&href=xtml/RM000004273004X.html&locale=en&model=Prius%20PH, pages 1-65.	
	3	Hybrid/Battery Control: Plug-In Charge Control System: Details; 2012 MY Prius PHV [01/2012-] https://techinfo.toyota.com/t3Portal/resources/jsp/siviewer/index.jsp?dir=ncf/NM19G0U&href=xtml/RM000005417000X.html&locale=en&model=Prius%20PH, pages 1-9.	

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EXAMINER SIGNATURE

Examiner Signature	/KAWING CHAN/	Date Considered	05/30/2017

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2017-05-19
Name/Print	Craig M. Drachtman	Registration Number	73016

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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.C/

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	Art Unit
	KAWING CHAN	2837

CPC- SEARCHED		
Symbol	Date	Examiner
h02p4/00 b60l11/005 b60l15/20	04/29/16	K.C.

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
318	500, 494	04/29/16	K.C.

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search	04/29/16	K.C.
assignee search	04/29/16	K.C.
IDS search	05/01/17	K.C.
IDS search	05/30/2017	KC

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	See EAST search history	05/01/17	K.C.

	/KAWING CHAN/ Primary Examiner.Art Unit 2837

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	8	("20080197810" | "20090115375" | "20100240491" | "5343970" | "6209672" | "6554088" | "6583599" | "8535200").PN.	US-PGPUB; USPAT	SAME	ON	2017/05/30 06:33

5/ 30/ 2017 6:34:46 AM
C:\ Users\ kchan1\ Documents\ EAST\ Workspaces\ 14094086.wsp

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	**Art Unit**
	KAWING CHAN	2837

CPC						
Symbol					**Type**	**Version**
H02P		4	/	00	F	2013-01-01
B60L		7	/	18	I	2013-01-01
B60L		11	/	005	I	2013-01-01
B60L		11	/	1868	I	2013-01-01
B60L		15	/	20	I	2013-01-01
B60L		15	/	209	I	2013-01-01
B60L		15	/	2081	I	2013-01-01
B60L		2240	/	421	A	2013-01-01
B60L		2240	/	423	A	2013-01-01
Y02T		10	/	645	A	2013-01-01
Y02T		10	/	7005	A	2013-01-01
Y02T		10	/	7022	A	2013-01-01
Y02T		10	/	7066	A	2013-01-01
Y02T		10	/	72	A	2013-01-01
Y02T		10	/	7275	A	2013-01-01
Y02T		90	/	16	A	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	19	
/KAWING CHAN/ Primary Examiner.Art Unit 2837	05/30/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	**Art Unit**
	KAWING CHAN	2837

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
318	500

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
318	494				

INTERNATIONAL CLASSIFICATION					
CLAIMED					**NON-CLAIMED**
H	0	2	P	4 / 00 (2006.0)	
B	6	0	L	15 / 20 (2006.0)	

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	19	
/KAWING CHAN/ Primary Examiner.Art Unit 2837	05/30/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	**Art Unit**
	KAWING CHAN	2837

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	16	17												
2	2	13	18												
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-	9														
8	10														
9	11														
-	12														
11	13														
-	14														
12	15														
15	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 19	
/KAWING CHAN/ Primary Examiner.Art Unit 2837 (Primary Examiner)	05/30/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 205

To: gpo.mail@ge.com,gedocket@meagheremanuel.com,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 131278

Jun 09, 2017 03:52:13 AM

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GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 131278 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

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Application	Document	Mailroom Date	Attorney Docket No.
14094086	NOA	06/09/2017	256975-2
	1449	06/09/2017	256975-2
	1449	06/09/2017	256975-2

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Thank you for prompt attention to this notice,

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6271648	B1	2001-08-07	Miller	

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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou
	Art Unit	2837
	Examiner Name	CHAN, KAWING
	Attorney Docket Number	256975-2

	1	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2017-06-02
Name/Print	Craig M. Drachtman	Registration Number	73,016

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	29383281
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Craig Michael Drachtman/Colleen Maroney
Filer Authorized By:	Craig Michael Drachtman
Attorney Docket Number:	256975-2
Receipt Date:	02-JUN-2017
Filing Date:	02-DEC-2013
Time Stamp:	15:20:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	256975_2_IDS.pdf	1035120 12c983154604b67227d7110ed2a0329674 7e262a	no	4

Warnings:

Information:	
Total Files Size (in bytes):	1035120

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-14)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	14094086	Filing Date	2013-12-02	Docket Number (if applicable)	256975-2	Art Unit	2837
First Named Inventor	Jian Zhou			Examiner Name	CHAN, KAWING		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, to any international application that does not comply with the requirements of 35 U.S.C. 371, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV.

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☒ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 090470

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (07-14)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2017-05-19
Name	Craig M. Drachtman	Registration Number	73016

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

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PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5343970		1994-09-06	Severinsky	
	2	6209672	B1	2001-04-03	Severinsky	
	3	6554088	B2	2003-04-29	Severinsky et al.	
	4	6583599	B1	2003-06-24	Phillips et al.	
	5	8535200	B2	2013-09-17	Vyas et al.	

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	1	20080197810	A1	2008-08-21	Ishikawa et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou
	Art Unit	2837
	Examiner Name	CHAN, KAWING
	Attorney Docket Number	256975-2

	2	20090115375	A1	2009-05-07	Iida	
	3	20100240491	A1	2010-09-23	Vyas et al.	

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	1	200023313	JP		2000-01-21	Suzuki Motor Corporation		

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	PCED enUSA 2010 Fusion Milan Hybrid, Description and Operation, pages 1-121.	
	2	Hybrid/Battery Control: Hybrid Control System: Details (2010 Prius PHV), 9-23-2011, https://techinfo.toyota.com/t3Portal/resources/jsp/siviewer/index.jsp?dir=ncf/NM14C0U&href=xtml/RM000004273004X.html&locale=en&model=Prius%20PH, pages 1-65.	
	3	Hybrid/Battery Control: Plug-In Charge Control System: Details; 2012 MY Prius PHV [01/2012-] https://techinfo.toyota.com/t3Portal/resources/jsp/siviewer/index.jsp?dir=ncf/NM19G0U&href=xtml/RM000005417000X.html&locale=en&model=Prius%20PH, pages 1-9.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou
	Art Unit	2837
	Examiner Name	CHAN, KAWING
	Attorney Docket Number	256975-2

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2017-05-19
Name/Print	Craig M. Drachtman	Registration Number	73016

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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Electronic Patent Application Fee Transmittal

Application Number:	14094086
Filing Date:	02-Dec-2013
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Filer:	Craig Michael Drachtman/Colleen Maroney
Attorney Docket Number:	256975-2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1700	1700
		Total in USD ($)		**1700**

Electronic Acknowledgement Receipt

EFS ID:	29262656
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Craig Michael Drachtman/Colleen Maroney
Filer Authorized By:	Craig Michael Drachtman
Attorney Docket Number:	256975-2
Receipt Date:	19-MAY-2017
Filing Date:	02-DEC-2013
Time Stamp:	15:57:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1700
RAM confirmation Number	052217INTEFSW00002657090470
Deposit Account	090470
Authorized User	Colleen Maroney

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		256975_2_ResponseNOA.pdf	120091 94b1b673db4426eb9e0bd27787f0d3b8937f4f7b	yes	11
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment Submitted/Entered with Filing of CPA/RCE		1	1	
	Claims		2	8	
	Applicant Arguments/Remarks Made in an Amendment		9	11	
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	256975_2_RCE.pdf	1350051 84d407305eed76cb46d9c828a3a7d79442 6b0698	no	3
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	256975_2_IDS.pdf	1035895 dc9007ed32cdb25b5abaf54085218cad7d1 95ae2	no	5
Warnings:					
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4	Foreign Reference	256975_2_JP2000023313.pdf	309496 6b3397dbada53572b8fa4d3b10e1eb440a 4fc9e8	no	8
Warnings:					
Information:					
5	Non Patent Literature	256975_2_NPL1.pdf	14890732 10bd58643bfbb786d20f30227aec8d8e3cc c6b77	no	121

Warnings:					
Information:					
6	Non Patent Literature	256975_2_NPL2.pdf	1622958 df89dc25e07ffa143b392249007068cf2be5615d	no	65
Warnings:					
Information:					
7	Non Patent Literature	256975_2_NPL3.pdf	362810 1972be550e56dfca00644d1a1fd0cf360e358635	no	9
Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	30272 dd42ca9e491e96f45c7e95b6fa457cfc07d4defb	no	2
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of: Jian Zhou et al. **Application No.:** 14/094,086 **Confirmation No.:** 1896 **Filed:** 12/02/2013 **For:** Electric drive system and energy management method **Group:** 2837 **Examiner:** Chan, Kawing	**Our File:** 256975-2 **Date:** May 19, 2017

REPLY PURSUANT TO 37 C.F.R. §1.114

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Examiner:

This Reply is being timely filed in response to the Notice of Allowance dated May 5, 2017. A request for continued examination (RCE) is filed concurrently herewith.

Please amend the application without prejudice or disclaimer as follows:

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An electric drive system, comprising:

an energy storage system (ESS), comprising:

a first energy storage unit; and

a second energy storage unit;

a power conversion system coupled to the ESS;

an alternating current (AC) traction system coupled to the power conversion system for converting electric power to mechanical torque, wherein the AC traction system comprises:

a first AC drive device for providing or receiving a first mechanical torque; and

a second AC drive device for providing or receiving a second mechanical torque;

a transmission device coupled to the first AC drive device for providing or receiving a third mechanical torque;

a power device coupled to ~~the AC traction system~~ the transmission device and the second AC drive device, the power device comprising one or more gears configured ~~for combining~~ to:

combine the [[first]] third mechanical torque and second mechanical torque into a [[third]] fourth mechanical torque; and

output the fourth mechanical torque to a load; and

an energy management system (EMS) in communication with the ESS, the AC traction system, and the power conversion system for providing

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control signals.

2. (Previously Presented) The electric drive system of claim 1, further comprising a pre-charging switching device coupled between the first energy storage unit and the second energy storage unit.

3. (Previously Presented) The electric drive system of claim 2, wherein the pre-charging switching device is a unidirectional switching device.

4. (Previously Presented) The electric drive system of claim 1, wherein the power conversion system comprises a power conversion device.

5. (Previously Presented) The electric drive system of claim 1, wherein the power conversion system further comprises:

a first power conversion device coupled to the first energy storage unit; and

a second power conversion device coupled to the second energy storage unit.

6. (Previously Presented) The electric drive system of claim 1, wherein the power conversion system further comprises:

a first power conversion device coupled to the first energy storage unit; and

a second power conversion device coupled in series with the first power conversion device.

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7. (Previously Presented) The electric drive system of claim 1, wherein:

the first AC drive device comprises:

at least one of an induction motor (IM) and an interior permanent motor (IPM) operated as a first AC motor; and

a first DC/AC inverter coupled to the first AC motor; and

the second AC drive device comprises:

at least one of the IM and the IPM operated as a second AC motor; and

a second DC/AC inverter coupled to the second AC motor.

8. (Canceled)

9. (Canceled)

10. (Currently Amended) The electric drive system of claim 1, wherein the power device is further configured for splitting the [[third]] fourth mechanical torque into the [[first]] third mechanical torque and second mechanical torque.

11. (Currently Amended) The electric drive system of claim 10, wherein the power device is further configured to:

provide the [[first]] third mechanical torque to the transmission device, the transmission device providing the first mechanical torque to the first AC drive device for converting the first mechanical torque into electric power for charging the ESS; and

provide the second mechanical torque to the second AC drive device for

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converting the second mechanical torque into electric power for charging the ESS.

12. (Canceled)

13. (Currently Amended) An energy management method, comprising:

enabling at least one of a first AC drive device and a second AC drive device based at least in part on an electric drive system speed signal;

enabling an energy storage system (ESS) comprising at least one of a first energy storage unit and a second energy storage unit; and

sending power control signals to a power conversion system for controlling power flow paths in an electric drive system, wherein controlling the power flow paths comprises:

receiving or providing at least one input power by the power conversion system; and

providing or receiving at least one output power by the power conversion system

converting an electric power generated from the ESS into a first mechanical torque by the first AC drive device;

splitting the first torque into a second mechanical torque and a third mechanical torque;

providing the second mechanical torque to the second AC drive device for converting the second mechanical torque into electric power for charging the second energy storage unit; and

providing the third mechanical torque to a load.

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14. (Canceled)

15. (Original) The method of claim 13, further comprising:

calculating a first torque command signal and a second torque command signal through a torque distribution unit; and

sending the first torque command signal and the second torque control signal to the first AC drive device and the second AC drive device, respectively.

16. (Previously Presented) The method of claim 13, further comprising:

determining an operating mode of a propulsion system based at least in part on the electric drive system speed signal, wherein the operating mode comprises:

a normal mode comprising a starting mode, an accelerating mode, a cruising mode, and a braking mode; and

a fault-tolerate mode.

17. (Original) The method of claim 16, further comprising one of the following:

enabling at least one of the first AC drive device and second AC drive device and at least one of the first energy storage unit and second energy storage unit in the fault-tolerate mode;

enabling the second AC drive device when a required power P_{req} is within the ability of the second AC drive device in the starting mode;

enabling the first AC drive device when P_{req} exceeds the ability of the second AC drive device in the starting mode;

enabling both of the first AC drive device and second AC drive device

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in the accelerating mode;

enabling at least one of the first AC drive device and second AC drive device in the cruising mode; and

enabling both of the first AC drive device and second AC drive device in the braking mode.

18. (Original) The method of claim 15, wherein the torque distribution unit comprises a torque distribution algorithm with a look up table defining high efficiency areas of two AC motors according to efficiency maps of each AC motor in the first AC drive device and the second AC drive device for reducing total loss.

19. (Original) The method of claim 18, further comprising changing an operating point of the first AC drive device through a transmission device for optimizing the torque distribution algorithm.

20. (Original) The method of claim 13, further comprising enabling the second energy storage unit as an assistant to provide additional power when the first energy storage unit fails to provide a required power.

21. (Canceled)

22. (Currently Amended) An electric drive system, comprising:

an energy storage system (ESS) comprising a plurality of energy storage units;

a power conversion system coupled to the ESS;

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an alternating current (AC) traction system coupled to the power conversion system for converting electric power to mechanical torque, wherein the AC traction system comprises:

a first AC drive device for providing or receiving a first mechanical torque; and

a second AC drive device for providing or receiving a second mechanical torque;

a power device coupled to the AC traction system configured for splitting the first mechanical torque into the second mechanical torque and a third mechanical torque; and

an energy management system (EMS) in communication with the ESS, the AC traction system, and the power conversion system for providing control signals.

23. (Currently Amended) The electric drive system of claim 22, wherein the power device is further configured for combining the second mechanical torque and third mechanical torque into the first mechanical torque.

24. (New) The electric drive system of claim 1, wherein the EMS is further configured to selectively:

enable both the first and second AC motors to provide mechanical torque to the load through the power device to drive the vehicle; and

enable the first AC motor to provide mechanical torque to the load through the power device to drive the vehicle, and enable the second AC motor to operate as a generator to receive mechanical torque from the power device to generate electrical power.

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REMARKS

After the foregoing Amendment, claims 1-7, 10-11, 13, 15-20, and 22-24 are currently pending in this application. Claims 8-9, 12, 14, and 21 are canceled without prejudice. Claims 1, 10-11, 13, and 22-23 are amended. New claim 24 is added. No new matter has been added.

Allowable Subject Matter

Applicants thank the Examiner for allowing claims 1-7, 10-11, 13, 15-20, and 22-23.

Claim 1 has been amended to incorporate the subject matter from previously allowed dependent claim 12, notably a transmission device coupled between the first AC drive device and power device, the transmission device configured to provide or receive mechanical torque, in order to better define the invention. Support for the amendment is found in at least Figure 2, and paragraphs [0035]-[0036] and [0089] of the application as filed. Thus, no new matter is added.

Claims 10-11 have also been amended to be consistent with amended claim 1, and claims 13 and 22-23 have been amended as well to be placed in better form.

In view of the amendments to the claims, it is respectfully submitted that claims 1-7, 10-11, 13, 15-20, and 22-23 are still in condition for allowance.

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New Claim 24

New claim 24 is allowable for at least the following reasons. New dependent claim recites that the EMS is further configured to selectively: enable both the first and second AC motors to provide mechanical torque to the load through the power device to drive the vehicle; and enable the first AC motor to provide mechanical torque to the load through the power device to drive the vehicle, and enable the second AC motor to operate as a generator to receive mechanical torque from the power device to generate electrical power. Support for new claim 24 is found in at least Figure 2 and paragraph [0070] of the application as filed. Thus, no new matter is added. Since new claim 24 is dependent upon independent claim 1, this claim is allowable for the same reasons as claim 1. Therefore, allowance of claim 24 is respectfully requested.

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Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephonic interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

Should any fees be due, the Commissioner is hereby authorized to charge any fees in connection with this application and to credit any overpayments to Deposit Account No. 09-0470.

In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,
Jian Zhou et al.

By: /Craig M. Drachtman/
Craig M. Drachtman
Registration No. 73,016

Meagher Emanuel
Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542
609-454-3500

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 236

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/094,086	Filing Date 12/02/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 05/19/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 19	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
DOROTHY BELL

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

131278 7590 05/05/2017

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851

EXAMINER
CHAN, KAWING

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 05/05/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

TITLE OF INVENTION: Electric Drive System and Energy Management Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$960	$960	08/07/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

131278 7590 05/05/2017
GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

TITLE OF INVENTION: Electric Drive System and Energy Management Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$960	$960	08/07/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHAN, KAWING	2837	318-500000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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131278 7590 05/05/2017

GE GLOBAL PATENT OPERATION
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901 MAIN AVENUE
NORWALK, CT 06851

EXAMINER	
CHAN, KAWING	
ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 05/05/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
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OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/094,086	Applicant(s) ZHOU ET AL.	
	Examiner KAWING CHAN	Art Unit 2837	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *IDS filed 04/18/17*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-7,10-13 and 15-23*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☒ All b) ☐ Some *c) ☐ None of the:
   1. ☒ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 04/18/17
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☒ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/KAWING CHAN/
Primary Examiner, Art Unit 2837

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

- In claim 1, replace "the first torque and second torque" in the second last paragraph with "the first mechanical torque and the second mechanical torque";
- In claim 10, replace "the third torque into the first torque and second torque" with "the third mechanical torque into the first mechanical torque and the second mechanical torque";
- In claim 11, replace ALL "the first torque" and "the second torque" with "the first mechanical torque" and "the second mechanical torque", respectively;
- In claim 13, replace "the first torque" in line 17 with "the first mechanical torque", and replace ALL "the second torque" in line 19-20 with "the second mechanical torque", and also replace "the third torque" in the last line with "the third mechanical torque";

- In claim 22, replace “the first torque into the second torque” in line 13 with “the first mechanical torque into the second mechanical torque”;
- In claim 23, replace “the second torque and third torque" with "the second mechanical torque and the third mechanical torque".

Allowable Subject Matter

3. Claims 1-7, 10-13 and 15-23 are allowed.

4. The following is an examiner’s statement of reasons for allowance

The cited prior art references fail to teach or disclose an electric drive system, comprising:

An alternating current traction system comprises:

A first AC drive device for providing a first mechanical torque and a second AC drive device for providing a second mechanical torque, and a power device coupled to the AC traction system for combining the first mechanical torque and the second mechanical torque into a third mechanical torque (Claim 1);

An energy management method, comprising:

Converting an electric power generated from the ESS into a first mechanical torque by the first AC drive device, splitting the first mechanical torque into a second mechanical torque and a third mechanical torque, and providing the second mechanical torque to the second AC drive device for charging the second energy storage unit, and providing the third mechanical torque to a load (claim 13);

An electric drive system, comprising:

AC traction system comprises a first AC drive device for providing or receiving a first mechanical torque and a second AC drive device for providing or receiving a second mechanical torque, a power device coupled to the AC traction system for splitting the first mechanical torque into the second mechanical torque and a third mechanical torque (Claim 23).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAWING CHAN whose telephone number is (571)270-3909. The examiner can normally be reached on Mon-Fri 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shawki S. Ismail can be reached on 571-272-3985. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KAWING CHAN/
Primary Examiner, Art Unit 2837

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	4	("6608396" | "7285926" | "7723932" | "8415909").PN.	US-PGPUB; USPAT	SAME	ON	2017/05/01 07:05

5/ 1/ 2017 7:14:16 AM
C:\ Users\ kchan1\ Documents\ EAST\ Workspaces\ 14094086.wsp

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6608396	B2	2003-08-19	Downer et al.	
	2	7723932	B2	2010-05-25	King et al.	
	3	7285926	B2	2007-10-23	McGarry et al.	
	4	8415909	B2	2013-04-09	Ramamurthy et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.C/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou
	Art Unit	2837
	Examiner Name	CHAN, KAWING
	Attorney Docket Number	256975-2

	1						

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Toyota Prius, "Plug-in Hybrid Gasoline-Electric Hybrid Synergy Drive", Hybrid Vehicle Dismantling Manual, 74 pages.	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/KAWING CHAN/	Date Considered	04/27/2017

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.C/

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2017-04-18
Name/Print	Craig M. Drachtman	Registration Number	73,016

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.C/

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

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Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	Art Unit
	KAWING CHAN	2837

CPC- SEARCHED		
Symbol	Date	Examiner
h02p4/00 b60l11/005 b60l15/20	04/29/16	K.C.

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
318	500, 494	04/29/16	K.C.

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search	04/29/16	K.C.
assignee search	04/29/16	K.C.
IDS search	05/01/17	K.C.

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	See EAST search history	05/01/17	K.C.

	/KAWING CHAN/ Primary Examiner.Art Unit 2837

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	**Art Unit**
	KAWING CHAN	2837

CPC						
Symbol					**Type**	**Version**
H02P		4	/	00	F	2013-01-01
B60L		7	/	18	I	2013-01-01
B60L		11	/	005	I	2013-01-01
B60L		11	/	1868	I	2013-01-01
B60L		15	/	20	I	2013-01-01
B60L		15	/	209	I	2013-01-01
B60L		15	/	2081	I	2013-01-01
B60L		2240	/	421	A	2013-01-01
B60L		2240	/	423	A	2013-01-01
Y02T		10	/	645	A	2013-01-01
Y02T		10	/	7005	A	2013-01-01
Y02T		10	/	7022	A	2013-01-01
Y02T		10	/	7066	A	2013-01-01
Y02T		10	/	72	A	2013-01-01
Y02T		10	/	7275	A	2013-01-01
Y02T		90	/	16	A	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/KAWING CHAN/ Primary Examiner.Art Unit 2837	05/01/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	**Art Unit**
	KAWING CHAN	2837

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
318	500

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
318	494				

INTERNATIONAL CLASSIFICATION					
CLAIMED					**NON-CLAIMED**
H	0	2	P	4 / 00 (2006.0)	
B	6	0	L	15 / 20 (2006.0)	

NONE	**Total Claims Allowed:**	
(Assistant Examiner) (Date)	20	
/KAWING CHAN/ Primary Examiner.Art Unit 2837 05/01/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner) (Date)	1	2

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 254

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	**Art Unit**
	KAWING CHAN	2837

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	18	17												
2	2	15	18												
3	3	16	19												
4	4	13	20												
5	5	11	21												
6	6	19	22												
7	7	20	23												
-	8														
-	9														
8	10														
9	11														
10	12														
12	13														
-	14														
14	15														
17	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/KAWING CHAN/ Primary Examiner.Art Unit 2837 (Primary Examiner)	05/01/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 255

To: gpo.mail@ge.com,gedocket@meagheremanuel.com,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 131278

May 05, 2017 03:56:02 AM

Dear PAIR Customer:

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 131278 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
14094086	NOA	05/05/2017	256975-2
	1449	05/05/2017	256975-2

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-14)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	14094086	Filing Date	2013-12-02	Docket Number (if applicable)	256975-2	Art Unit	2837
First Named Inventor	Jian Zhou			Examiner Name	CHAN, KAWING		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, to any international application that does not comply with the requirements of 35 U.S.C. 371, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV.

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☐ Amendment/Reply
- ☒ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 090470

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (07-14)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2017-04-18
Name	Craig M. Drachtman	Registration Number	73016

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6608396	B2	2003-08-19	Downer et al.	
	2	7723932	B2	2010-05-25	King et al.	
	3	7285926	B2	2007-10-23	McGarry et al.	
	4	8415909	B2	2013-04-09	Ramamurthy et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou
	Art Unit	2837
	Examiner Name	CHAN, KAWING
	Attorney Docket Number	256975-2

	1						

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Toyota Prius, "Plug-in Hybrid Gasoline-Electric Hybrid Synergy Drive", Hybrid Vehicle Dismantling Manual, 74 pages.	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2017-04-18
Name/Print	Craig M. Drachtman	Registration Number	73,016

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Electronic Patent Application Fee Transmittal

Application Number:	14094086
Filing Date:	02-Dec-2013
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Filer:	Craig Michael Drachtman/Colleen Maroney
Attorney Docket Number:	256975-2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
PETITION FEE- 37 CFR 1.17(H) (GROUP III)	1464	1	140	140
RCE- 1st Request	1801	1	1200	1200
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1340**

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Decision Date : April 18, 2017

In re Application of :

Jian Zhou

DECISION ON PETITION
UNDER CFR 1.313(c)(2)

Application No : 14094086

Filed : 02-Dec-2013

Attorney Docket No : 256975-2

This is an electronic decision on the petition under 37 CFR 1.313(c)(2), filed April 18, 2017 , to withdraw the above-identified application from issue after payment of the issue fee.

The petition is **GRANTED.**

The above-identified application is withdrawn from issue for consideration of a submission under 37 CFR 1.114 (request for continued examination). See 37 CFR 1.313(c)(2).

Petitioner is advised that the issue fee paid in this application cannot be refunded. If, however, this application is again allowed, petitioner may request that it be applied towards the issue fee required by the new Notice of Allowance.

Telephone inquiries concerning this decision should be directed to the Patent Electronic Business Center (EBC) at 866-217-9197.

This application file is being referred to Technology Center AU 2837 for processing of the request for continuing examination under 37 CFR 1.114 .

Office of Petitions

Electronic Acknowledgement Receipt

EFS ID:	28958236
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Craig Michael Drachtman/Colleen Maroney
Filer Authorized By:	Craig Michael Drachtman
Attorney Docket Number:	256975-2
Receipt Date:	18-APR-2017
Filing Date:	02-DEC-2013
Time Stamp:	16:08:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$1340
RAM confirmation Number	041917INTEFSW00002943090470
Deposit Account	090470
Authorized User	Colleen Maroney

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition automatically granted by EFS	petition-request.pdf	31596 a821f5b8f63129a9b095c57440a43efd2f706784	no	2
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	256975_2_RCE.pdf	1350038 c92cf98d9c20cb3b27f472ad5e9ab31b019cfe37	no	3
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	256975_2_IDS.pdf	1035297 19c13237b78c9258f3e4090acb791c25d173a5ff	no	4
Warnings:					
Information:					
4	Non Patent Literature	256975_2_NPL1.pdf	4791449 5eb2c3488cf2119501c26a3c2c105b6b322f0ae2	no	74
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	32027 487bc61a949cb575f7195047aa7ca5d5d262d6f5	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	7240407		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: PET.AUTO Document Description: Petition automatically granted by EFS-Web	PTO/SB/140 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**PETITION TO WITHDRAW AN APPLICATION FROM ISSUE AFTER PAYMENT OF THE ISSUE FEE UNDER 37 CFR 1.313(c)**
Application Number	14094086
Filing Date	02-Dec-2013
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	KAWING CHAN
Attorney Docket Number	256975-2
Title	Electric Drive System and Energy Management Method

An application may be withdrawn from issue for further action upon petition by the applicant. To request that the Office withdraw an application from issue, applicant must file a petition under this section including the fee set forth in § 1.17(h) and a showing of good and sufficient reasons why withdrawal of the application from issue is necessary.

APPLICANT HEREBY PETITIONS TO WITHDRAW THIS APPLICATION FROM ISSUE UNDER 37 CFR 1.313(c).

A grantable petition requires the following items:
(1) Petition fee; and
(2) One of the following reasons:
(a) Unpatentability of one or more claims, which must be accompanied by an unequivocal statement that one or more claims are unpatentable, an amendment to such claim or claims, and an explanation as to how the amendment causes such claim or claims to be patentable;
(b) Consideration of a request for continued examination in compliance with § 1.114 (for a utility or plant application only); or
(c) Express abandonment of the application. Such express abandonment may be in favor of a continuing application, but not a CPA under 37 CFR 1.53(d).

Petition Fee

○	Small Entity
○	Micro Entity
◉	Regular Undiscounted

Reason for withdrawal from issue

◯ One or more claims are unpatentable ◉ Consideration of a request for continued examination (RCE) (List of Required Documents and Fees) ◯ Applicant hereby expressly abandons the instant application (any attorney/agent signing for this reason must have power of attorney pursuant to 37 CFR 1.32(b)).
RCE request,submission, and fee. ☐ I certify, in accordance with 37 CFR 1.4(d)(4) that : The RCE request ,submission, and fee have already been filed in the above-identified application on ☒ Are attached.
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ◉ An attorney or agent registered to practice before the Patent and Trademark Office who has been given power of attorney in this application. ◯ An attorney or agent registered to practice before the Patent and Trademark Office, acting in a representative capacity. ◯ A sole inventor ◯ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ◯ A joint inventor; all of whom are signing this e-petition

Signature	/Craig M. Drachtman/
Name	Craig M. Drachtman
Registration Number	73016

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 04/21/2017

ZZENEBE SALE #00000002 Mailroom Dt: 04/18/2017 090470 14094086
01 FC : 1251 200.00 DA

To: gpo.mail@ge.com,gedocket@meagheremanuel.com,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 131278

Apr 06, 2017 03:22:01 AM

Dear PAIR Customer:

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 131278 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
14094086	ISSUE.NTF	04/05/2017	256975-2

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	04/25/2017	9634584	256975-2	1896

131278 7590 04/05/2017

GE GLOBAL PATENT OPERATION
GE VENTURES-LICENSING (ME 131278)
901 MAIN AVENUE
NORWALK, CT 06851

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 557 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

General Electric Company, Schenectady, NY;
Jian Zhou, Shanghai, CHINA;
Fei Xu, Shanghai, CHINA;
Dong Liu, Shanghai, CHINA;
Hai Qiu, Shanghai, CHINA;
Pengju Kang, Yorktown Heights, NY;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

131278 7590 01/05/2017
GE Ventures- Licensing
C/O Meagher Emanuel Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

EFS WEB (Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

TITLE OF INVENTION: Electric Drive System and Energy Management Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	04/05/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHAN, KAWING	2837	318-500000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Meagher Emanuel Laks
2 Goldberg & Liao, LLP
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: GENERAL ELECTRIC COMPANY

(B) RESIDENCE: (CITY and STATE OR COUNTRY): SCHENECTADY, NEW YORK

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 090470 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Craig Michael Drachtman/ Date 2017-03-16

Typed or printed name CRAIG MICHAEL DRACHTMAN Registration No. 73,016

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

Electronic Patent Application Fee Transmittal

Application Number:	14094086
Filing Date:	02-Dec-2013
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Filer:	Craig Michael Drachtman/Silvia Mannes
Attorney Docket Number:	256975-2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**960**

Electronic Acknowledgement Receipt

EFS ID:	28674727
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Craig Michael Drachtman/Silvia Mannes
Filer Authorized By:	Craig Michael Drachtman
Attorney Docket Number:	256975-2
Receipt Date:	20-MAR-2017
Filing Date:	02-DEC-2013
Time Stamp:	12:33:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$960
RAM confirmation Number	032017INTEFSW00011429090470
Deposit Account	090470
Authorized User	Silvia Mannes

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	256975-2-IssueFee.pdf	1584284 1be85332482bbac1344f45a13c68274985b1ee25	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30227 47ce680e96148b9a592c7e3dc518cc481ddcf37d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1614511		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:	
Jian Zhou et al.	
Application No.:	14/094,086
Confirmation No.:	1896
Filed:	12/02/2013
For: Electric drive system and energy management method	
Group:	2837
Examiner: Chan, Kawing	

Our File: 256975-2

Date: March 7, 2017

AMENDMENT AFTER ALLOWANCE
PURSUANT TO 37 C.F.R. §1.312

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Examiner:

This Amendment after allowance is being filed in response to the Notice of Allowance dated January 5, 2017.

Please amend the application without prejudice or disclaimer as follows:

Amendments to the Drawings:

The attached sheets of drawings include changes to Figures 3-5. These sheets replace the original sheets for Figures 3-5 in order to fix a typographical error. No new matter has been added.

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 281

REMARKS

Applicants respectfully request entry of this amendment, which replaces original sheets for Figures 3-5 with replacement sheets of Figures 3-5 in order to fix a typographical error. No new matter has been added.

In view of the amendments to the drawings, and in further view of the foregoing remarks, it is respectfully submitted that the application is in condition for issuance. Accordingly, it is requested that the application be passed to issue. Should any fees be due, the Commissioner is hereby authorized to charge any fees and to credit any overpayments to Deposit Account No. 09-0470.

Respectfully submitted,
Jian Zhou et al.

By: /Craig M. Drachtman/
Craig M. Drachtman
Registration No. 73,016

Meagher Emanuel
Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542
609-454-3500

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 282

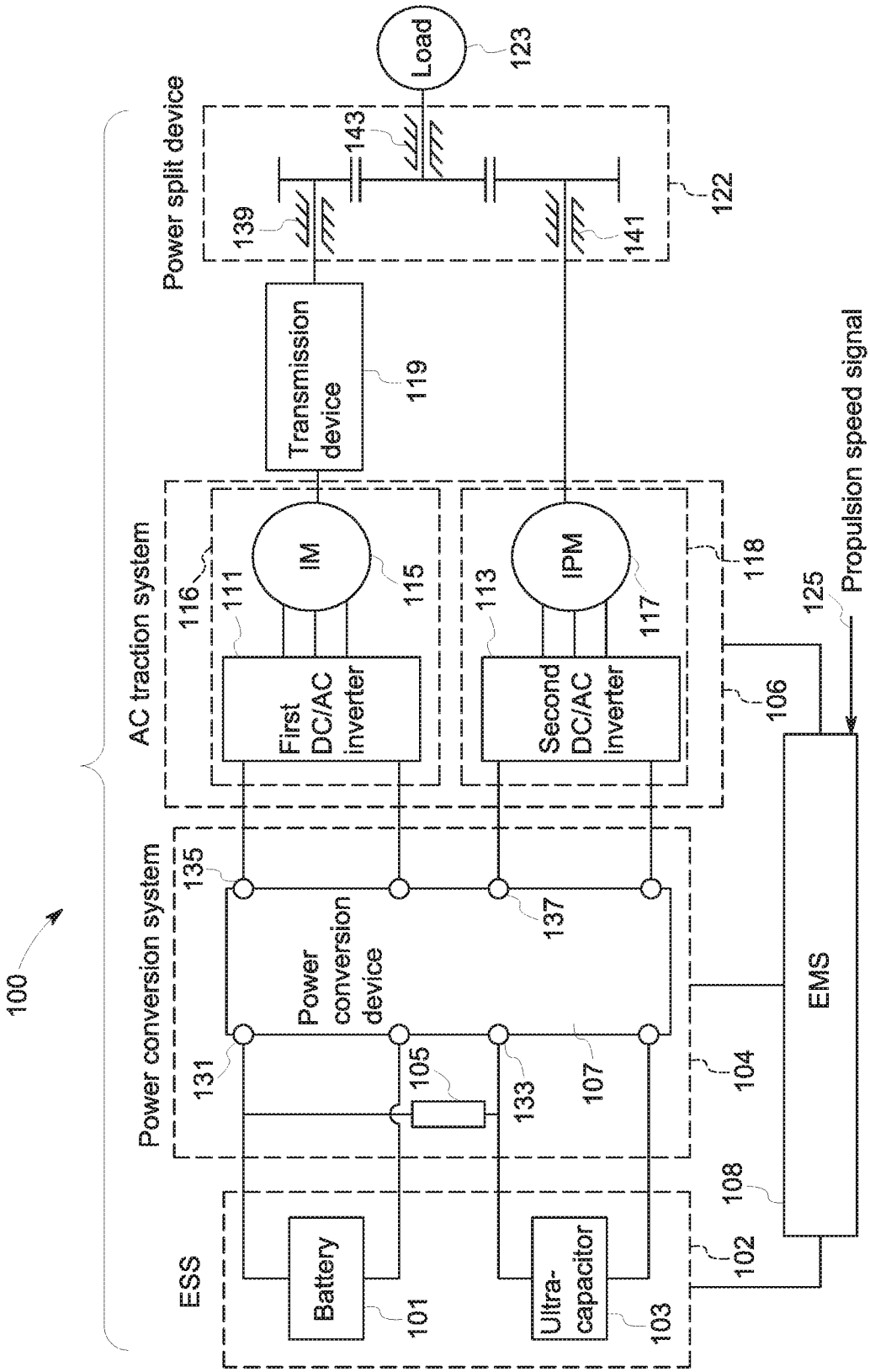

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Load
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143
139
141
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AC traction system
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111
IM
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First DC/AC inverter
Second DC/AC inverter
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Propulsion speed signal
106
Power conversion system
135
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Power conversion device
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EMS
ESS
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Battery
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Ultra-capacitor
103
102

FIG. 3

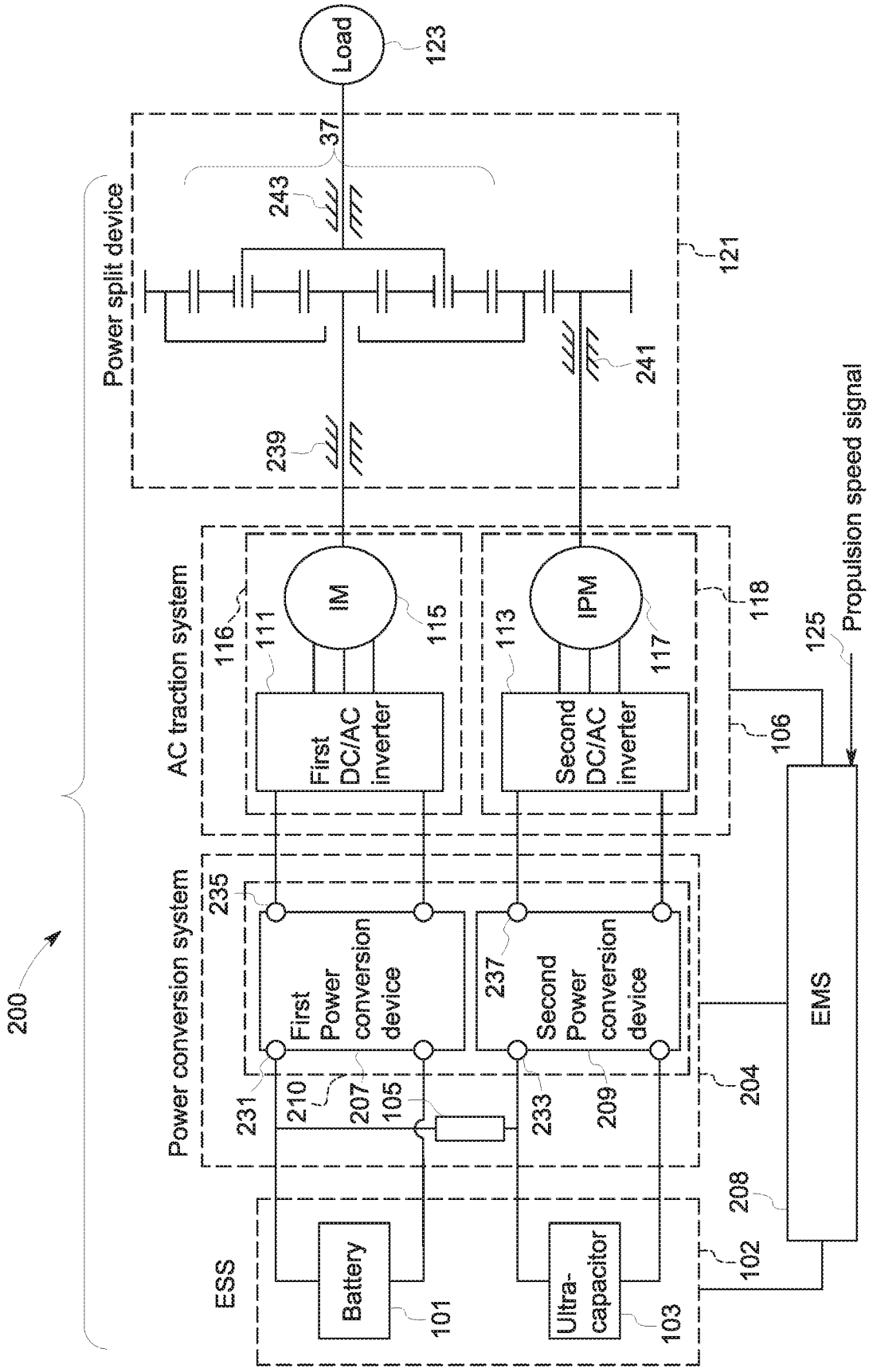

Load
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Power split device
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AC traction system
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111
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IPM
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First DC/AC inverter
Second DC/AC inverter
125
Propulsion speed signal
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Power conversion system
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First Power conversion device
Second Power conversion device
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204
208
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Battery
Ultra-capacitor
102
101
103

FIG. 4

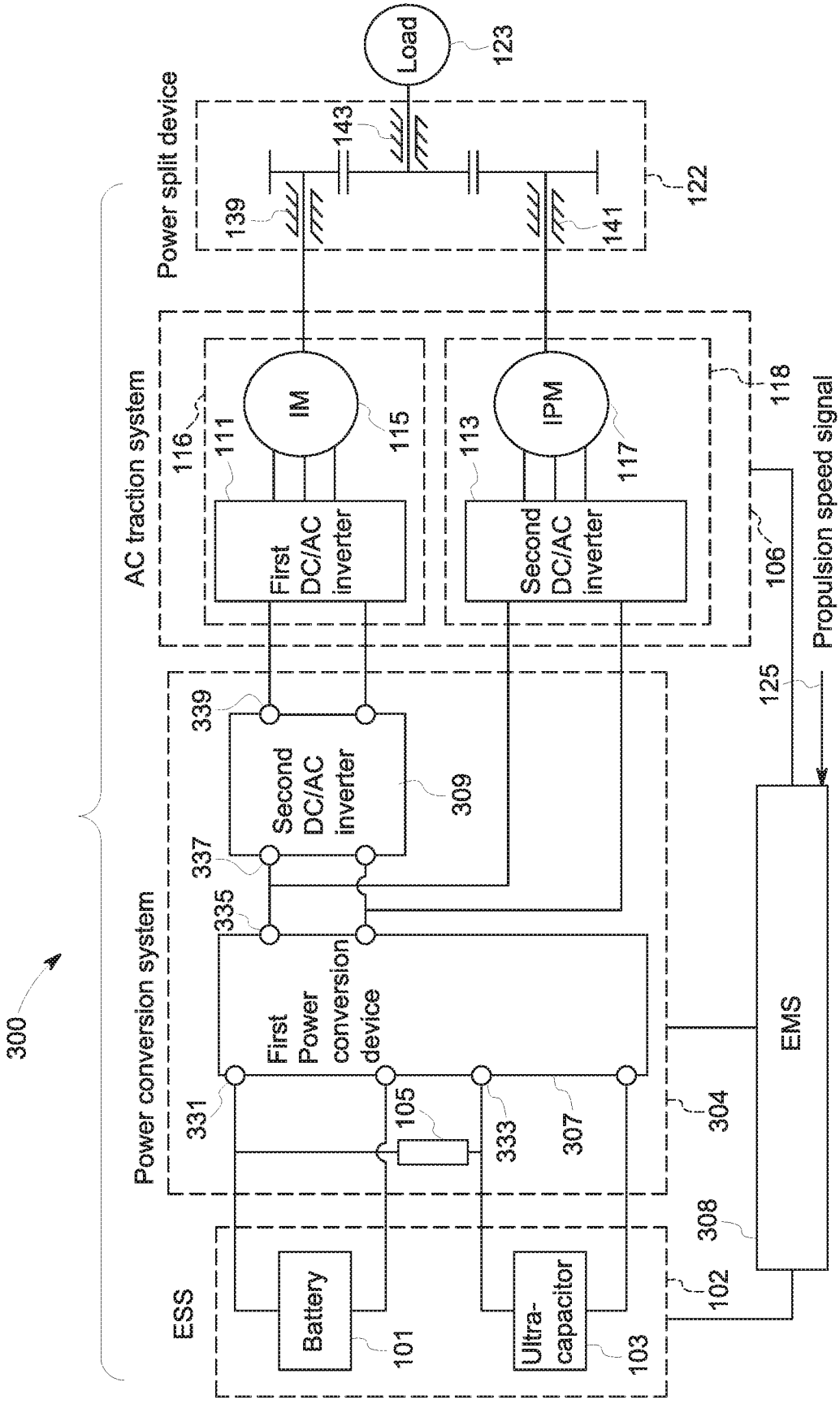

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Power split device
143
139
141
122
AC traction system
IM
IPM
116
111
115
113
117
118
First DC/AC inverter
Second DC/AC inverter
106
Propulsion speed signal
125
339
Second DC/AC inverter
309
337
335
Power conversion system
First Power conversion device
331
105
333
307
304
EMS
308
ESS
Battery
101
Ultra-capacitor
103
102

FIG. 5

Electronic Acknowledgement Receipt

EFS ID:	28559225
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Craig Michael Drachtman/Colleen Maroney
Filer Authorized By:	Craig Michael Drachtman
Attorney Docket Number:	256975-2
Receipt Date:	07-MAR-2017
Filing Date:	02-DEC-2013
Time Stamp:	15:47:38
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		256975_2_312Amendment.pdf	70067 1eb69e8d19304c58e95d04121f5616e0e0c1a671	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment after Notice of Allowance (Rule 312)	1	1
	Drawings-other than black and white line drawings	2	2
	Applicant Arguments/Remarks Made in an Amendment	3	3

Warnings:					
Information:					
2	Drawings-only black and white line drawings	256975_2_ReplaceplacementFigures.pdf	183729 a8ee5050bc252ed8a24504518d706695548a865e	no	3
Warnings:					
Information:					
		Total Files Size (in bytes):	253796		

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New Applications Under 35 U.S.C. 111
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National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

DocCode – SCORE

SCORE Placeholder Sheet for IFW Content

Application Number: 14094086 Document Date: 03/07/2017

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

- Drawing

At the time of document entry (noted above):

- USPTO employees may access SCORE content via eDAN using the Supplemental Content tab, or via the SCORE web page.
- External customers may access SCORE content via PAIR using the Supplemental Content tab.

Form Revision Date: August 26, 2013

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Alexandria, Virginia 22313-1450
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NOTICE OF ALLOWANCE AND FEE(S) DUE

131278 7590 01/05/2017

GE Ventures- Licensing
C/O Meagher Emanuel Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542

EXAMINER
CHAN, KAWING

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 01/05/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

TITLE OF INVENTION: Electric Drive System and Energy Management Method

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	04/05/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

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PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

131278 7590 01/05/2017
GE Ventures- Licensing
C/O Meagher Emanuel Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

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nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	04/05/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHAN, KAWING	2837	318-500000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/094,086	Applicant(s) ZHOU ET AL.	
	Examiner KAWING CHAN	Art Unit 2837	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed 09/16/16*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-7,10-13 and 15-23*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☒ All b) ☐ Some *c) ☐ None of the:
   1. ☒ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 09/16/16
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☒ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/KAWING CHAN/
Primary Examiner, Art Unit 2837

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

- In claim 1, replace "the first torque and second torque" in the second last paragraph with "the first mechanical torque and the second mechanical torque";
- In claim 10, replace "the third torque into the first torque and second torque" with "the third mechanical torque into the first mechanical torque and the second mechanical torque";
- In claim 11, replace ALL "the first torque" and "the second torque" with "the first mechanical torque" and "the second mechanical torque", respectively;
- In claim 13, replace "the first torque" in line 17 with "the first mechanical torque", and replace ALL "the second torque" in line 19-20 with "the second mechanical torque", and also replace "the third torque" in the last line with "the third mechanical torque";

- In claim 22, replace “the first torque into the second torque” in line 13 with “the first mechanical torque into the second mechanical torque”;
- In claim 23, replace “the second torque and third torque" with "the second mechanical torque and the third mechanical torque".

Allowable Subject Matter

3. Claims 1-7, 10-13 and 15-23 are allowed.

4. The following is an examiner’s statement of reasons for allowance

The cited prior art references fail to teach or disclose an electric drive system, comprising:

An alternating current traction system comprises:

A first AC drive device for providing a first mechanical torque and a second AC drive device for providing a second mechanical torque, and a power device coupled to the AC traction system for combining the first mechanical torque and the second mechanical torque into a third mechanical torque (Claim 1);

An energy management method, comprising:

Converting an electric power generated from the ESS into a first mechanical torque by the first AC drive device, splitting the first mechanical torque into a second mechanical torque and a third mechanical torque, and providing the second mechanical torque to the second AC drive device for charging the second energy storage unit, and providing the third mechanical torque to a load (claim 13);

An electric drive system, comprising:

AC traction system comprises a first AC drive device for providing or receiving a first mechanical torque and a second AC drive device for providing or receiving a second mechanical torque, a power device coupled to the AC traction system for splitting the first mechanical torque into the second mechanical torque and a third mechanical torque (Claim 23).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAWING CHAN whose telephone number is (571)270-3909. The examiner can normally be reached on Mon-Fri 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Shawki S. Ismail can be reached on 571-272-3985. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KAWING CHAN/
Primary Examiner, Art Unit 2837

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	4	("7963353" or "8639423").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2016/12/24 19:21
L14	1652	(318/500,494.ccls. or (h02p4/00 or b60l11/005 or b60l15/20).cpc.) and @pd>"20160429"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2016/12/24 19:48

12/24/2016 8:08:14 PM
C:\Users\kchan1\Documents\EAST\Workspaces\14094086.wsp

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	**Art Unit**
	KAWING CHAN	2837

CPC						
Symbol					**Type**	**Version**
H02P		4	/	00	F	2013-01-01
B60L		7	/	18	I	2013-01-01
B60L		11	/	005	I	2013-01-01
B60L		11	/	1868	I	2013-01-01
B60L		15	/	20	I	2013-01-01
B60L		15	/	209	I	2013-01-01
B60L		2240	/	421	A	2013-01-01
B60L		2240	/	423	A	2013-01-01
B60L		15	/	2081	I	2013-01-01
Y02T		10	/	7005	A	2013-01-01
Y02T		10	/	7022	A	2013-01-01
Y02T		90	/	16	A	2013-01-01
Y02T		10	/	7066	A	2013-01-01
Y02T		10	/	7275	A	2013-01-01
Y02T		10	/	645	A	2013-01-01
Y02T		10	/	72	A	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	20	
/KAWING CHAN/ Primary Examiner.Art Unit 2837	12/24/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	**Art Unit**
	KAWING CHAN	2837

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
318	500

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
318	494				

INTERNATIONAL CLASSIFICATION					
CLAIMED					**NON-CLAIMED**
H	0	2	P	4 / 00 (2006.0)	
B	6	0	L	15 / 20 (2006.01.01)	

NONE	**Total Claims Allowed:**	
(Assistant Examiner) (Date)	20	
/KAWING CHAN/ Primary Examiner.Art Unit 2837 12/24/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner) (Date)	1	2

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	Examiner	**Art Unit**
	KAWING CHAN	2837

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	18	17												
2	2	15	18												
3	3	16	19												
4	4	13	20												
5	5	11	21												
6	6	19	22												
7	7	20	23												
-	8														
-	9														
8	10														
9	11														
10	12														
12	13														
-	14														
14	15														
17	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/KAWING CHAN/ Primary Examiner.Art Unit 2837 (Primary Examiner)	12/24/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
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PTO/SB/08a (03-15)
Approved for use through 07/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7963353	B2	2011-06-21	Tatematsu et al.	
	2	8639423	B2	2014-01-28	Shaaf et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.C/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
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Examiner Signature	/KAWING CHAN/	Date Considered	12/24/2016

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.C/

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR2026-00333 BHILL Ex. 2004

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2016-09-16
Name/Print	Craig M. Drachtman	Registration Number	73,016

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	Art Unit
	KAWING CHAN	2837

CPC- SEARCHED		
Symbol	Date	Examiner
h02p4/00 b60l11/005 b60l15/20	04/29/16	K.C.

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Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
318	500, 494	04/29/16	K.C.

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search	04/29/16	K.C.
assignee search	04/29/16	K.C.

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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PATENT

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In the **PATENT APPLICATION** of: Jian Zhou et al. **Application No.:** 14/094,086 **Confirmation No.:** 1896 **Filed:** 12/02/2013 **For:** Electric Drive System and Energy Management Method **Group:** 2837 **Examiner:** Chan, Kawing	**Our File:** 256975-2 **Date:** September 16, 2016

REPLY PURSUANT TO 37 C.F.R. §1.111

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

This Reply is being timely filed in response to the Office Action dated June 30, 2016.

Please amend the application without prejudice or disclaimer as follows:

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An electric drive system, comprising:

an energy storage system (ESS), comprising:

a first energy storage unit ~~configured for providing or receiving a first power~~; and

a second energy storage unit ~~configured for providing or receiving a second power~~;

a power conversion system ~~electrically~~ coupled to the ESS ~~for converting an input power to an output power, wherein the power conversion system comprises a power conversion device, wherein the power conversion device comprises: a first terminal electrically coupled to the first energy storage unit; a second terminal electrically coupled to the second energy storage unit; a third terminal; and a fourth terminal~~;

an alternating current (AC) traction system ~~electrically~~ coupled to the power conversion system for converting ~~the output power of the power conversion system~~ electric power to mechanical torque, wherein the AC traction system comprises:

a first AC drive device ~~coupled to the third terminal of the power conversion device~~ for providing or receiving a first mechanical torque; and

a second AC drive device ~~coupled to the fourth terminal of the power conversion device~~ for providing or receiving a second mechanical torque;

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a power device coupled to the AC traction system configured for combining the first torque and second torque into a third mechanical torque; and

an energy management system (EMS) in communication with the ESS, the AC traction system, and the power conversion system for providing control signals.

2. (Currently Amended) The electric drive system of claim 1, ~~wherein the power conversion system further comprises:~~ further comprising a pre-charging switching device ~~electrically~~ coupled between the first energy storage unit and the second energy storage unit ~~for selectively providing a power flow path between the first energy storage unit and the second energy storage unit~~.

3. (Currently Amended) The electric drive system of claim 2, wherein the pre-charging switching device is a unidirectional switching device ~~for providing a unidirectional power flow path for charging the second energy storage unit~~.

4. (Currently Amended) The electric drive system of claim 1, wherein the power conversion ~~device is a single power conversion device~~ system comprises a power conversion device.

5. (Withdrawn Currently Amended) The electric drive system of claim 1, wherein the power conversion ~~device~~ system further comprises:

a first power conversion device~~, the first power conversion device is electrically~~ coupled to the first energy storage unit ~~through the first terminal~~

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~~and electrically coupled to the first AC drive device through the third terminal~~; and

a second power conversion device coupled ~~in parallel with the first power conversion device, the second power conversion device is electrically coupled~~ to the second energy storage unit ~~through the second terminal and electrically coupled to the second AC drive device through the fourth terminal~~.

6. (Withdrawn Currently Amended) The electric drive system of claim 1, wherein the power conversion ~~device~~ system further comprises:

a first power conversion device ~~electrically~~ coupled to the first energy storage unit ~~through the first terminal and electrically coupled to the second energy storage unit through the second terminal, and electrically coupled to the second AC drive device through the fourth terminal~~; and

a second power conversion device coupled in series with the first power conversion device~~, the second power conversion device is electrically coupled to the first AC drive device through the third terminal~~.

7. (Withdrawn Currently Amended) The electric drive system of claim 1, wherein:

the first AC drive device comprises:

at least one of an induction motor (IM) and an interior permanent motor (IPM) operated as a first AC motor; and

a first DC/AC inverter ~~electrically~~ coupled to the first AC motor ~~for providing AC power to the first AC motor~~; and

the second AC drive device comprises:

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at least one of the IM and the IPM operated as a second AC motor; and

a second DC/AC inverter ~~electrically~~ coupled to the second AC motor ~~for providing AC power to the second AC motor~~.

8. (Canceled)

9. (Canceled)

10. (Currently Amended) The electric drive system of claim [[9]] 1, wherein the power ~~split~~ device is further configured for splitting the third ~~mechanical~~ torque into the first ~~mechanical~~ torque and second ~~mechanical~~ torque~~, wherein:~~

~~the third mechanical terminal is configured for receiving the third mechanical torque from the load;~~

~~the first mechanical terminal is configured for providing the first mechanical torque which is converted into electric power for charging the ESS; and~~

~~the second mechanical terminal is configured for providing the second mechanical torque which is converted into electric power for charging the ESS~~.

11. (Currently Amended) The electric drive system of claim [[9]] 10, ~~wherein the power split device is configured for splitting the first mechanical torque into the second mechanical torque and third mechanical torque,~~ wherein the power device is further configured to:

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~~the first mechanical terminal is configured for receiving the first mechanical torque provided from the first AC drive device~~ provide the first torque to the first AC drive device for converting the first torque into electric power for charging the ESS; and

provide the second torque to the second AC drive device for converting the second torque into electric power for charging the ESS.

~~the second mechanical terminal is configured for providing the second mechanical torque to the second AC drive device and converting the second mechanical torque into electric power for charging the ESS; and~~

~~the third mechanical terminal is configured for providing the third mechanical torque to the load.~~

12. (Currently Amended) The electric drive system of claim [[9]] 1, further comprising a transmission device ~~mechanically~~ coupled between the AC traction system and the power device ~~split device for matching output speed of the AC traction system with an electric drive system speed~~.

13. (Currently Amended) An energy management method, comprising:

enabling at least one of a first AC drive device and a second AC drive device based at least in part on an electric drive system speed signal;

enabling an energy storage system (ESS) comprising at least one of a first energy storage unit and a second energy storage unit; and

sending power control signals to a power conversion system for controlling power flow paths in an electric drive system, wherein controlling the power flow paths comprises:

receiving or providing at least one input power by ~~at least one of~~

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~~a first terminal and a second terminal of~~ the power conversion system; and

providing or receiving at least one output power by ~~at least one of a third terminal and a fourth terminal of~~ the power conversion system

converting an electric power generated from the ESS into a first mechanical torque by the first AC drive device;

splitting the first torque into a second mechanical torque and a third mechanical torque;

providing the second torque to the second AC drive device for converting the second torque into electric power for charging the second energy storage unit; and

providing the third torque to a load.

14. (Canceled)

15. (Original) The method of claim 13, further comprising:

calculating a first torque command signal and a second torque command signal through a torque distribution unit; and

sending the first torque command signal and the second torque control signal to the first AC drive device and the second AC drive device, respectively.

16. (Currently Amended) The method of claim 13, further comprising:

determining an operating mode of a propulsion system based at least in part on the electric drive system speed signal, wherein the operating mode

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comprises:

a normal mode comprising a starting mode, an accelerating mode, a cruising mode, and a braking mode; and

a fault-tolerate mode.

17. (Original) The method of claim 16, further comprising one of the following:

enabling at least one of the first AC drive device and second AC drive device and at least one of the first energy storage unit and second energy storage unit in the fault-tolerate mode;

enabling the second AC drive device when a required power P_{req} is within the ability of the second AC drive device in the starting mode;

enabling the first AC drive device when P_{req} exceeds the ability of the second AC drive device in the starting mode;

enabling both of the first AC drive device and second AC drive device in the accelerating mode;

enabling at least one of the first AC drive device and second AC drive device in the cruising mode; and

enabling both of the first AC drive device and second AC drive device in the braking mode.

18. (Original) The method of claim 15, wherein the torque distribution unit comprises a torque distribution algorithm with a look up table defining high efficiency areas of two AC motors according to efficiency maps of each AC motor in the first AC drive device and the second AC drive device for reducing total loss.

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19. (Original) The method of claim 18, further comprising changing an operating point of the first AC drive device through a transmission device for optimizing the torque distribution algorithm.

20. (Original) The method of claim 13, further comprising enabling the second energy storage unit as an assistant to provide additional power when the first energy storage unit fails to provide a required power.

21. (New) The electric drive system of claim 1, further comprising a load coupled to the power device.

22. (New) An electric drive system, comprising:

an energy storage system (ESS) comprising a plurality of energy storage units;

a power conversion system coupled to the ESS;

an alternating current (AC) traction system coupled to the power conversion system for converting electric power to mechanical torque, wherein the AC traction system comprises:

a first AC drive device for providing or receiving a first mechanical torque; and

a second AC drive device for providing or receiving a second mechanical torque;

a power device coupled to the AC traction system configured for splitting the first torque into the second torque and a third mechanical torque; and

an energy management system (EMS) in communication with the ESS,

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the AC traction system, and the power conversion system for providing control signals.

23. (New) The electric drive system of claim 22, wherein the power device is further configured for combining the second torque and third torque into the first torque.

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REMARKS

After the foregoing Amendment, claims 1-7, 10-13, and 15-23 are currently pending in this application. Claims 8-9 and 14 are canceled without prejudice. Claims 5-7 are withdrawn from consideration. Claims 1-7, 10-13, and 16 are amended. New claims 21-23 are added. No new matter is added.

Allowable Subject Matter

Applicants thank the Examiner for indicating that original claims 9-12 and 14 contain allowable subject matter. In response, Applicants have incorporated the allowable subject matter into independent claims 1, 13, and 22, to be discussed below.

Claim Rejections – 35 USC § 102/103

Claims 1-4, 13, and 20 are rejected under 35 U.S.C. § 102(b) as being anticipated by King (US 7,595,597). Claims 15 and 18-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over King in view of Tang (US 2010/0222953). Claims 16-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over King in view of Rineh (US 2011/0057588). Reconsideration is respectfully requested.

Independent claim 1, and all claims dependent therefrom, are distinguishable over the prior art and in condition for allowance for at least the following reasons.

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Independent claim 1 as amended recites: An electric drive system, comprising: an energy storage system (ESS), comprising: a first energy storage unit; and a second energy storage unit; a power conversion system coupled to the ESS; an alternating current (AC) traction system coupled to the power conversion system for converting electric power to torque, wherein the AC traction system comprises: a first AC drive device for providing or receiving a first mechanical torque; and a second AC drive device for providing or receiving a second mechanical torque; a power device coupled to the AC traction system configured for combining the first torque and second torque into a third mechanical torque; and an energy management system (EMS) in communication with the ESS, the AC traction system, and the power conversion system for providing control signals. Support for the amendment is found in at least Figure 2 and paragraphs [0030]-[0032] of the application as filed. Thus, no new matter is added.

As amended, independent claim 1 has incorporated the subject matter the Examiner indicated is allowable from original claim 9. The cited references do not disclose, teach, or suggest "a power device coupled to the AC traction system configured for combining the first torque and second torque into a third mechanical torque," as recited in independent claim 1. Therefore, allowance of claim 1 is respectfully requested.

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Claims 2-7 and 10-12 are dependent upon independent claim 1 and these claims are allowable for the same reasons provided above.

For similar reasons, independent claim 13, and all claims dependent therefrom, are distinguishable over the prior art and in condition for allowance. As amended independent claim 13 has incorporated the subject matter the Examiner indicated is allowable from original claim 14. In particular, the cited references do not disclose, teach, or suggest controlling a power flow path by, "converting an electric power generated from the ESS into a first mechanical torque by the first AC drive device; splitting the first torque into a second mechanical torque and a third mechanical torque; providing the second torque to the second AC drive device for converting the second torque into electric power for charging the second energy storage unit; and providing the third torque to a load," as recited in independent claim 13. Therefore, allowance of independent claim 13 is respectfully requested.

Claims 15-20 are dependent upon independent claim 13 and these claims are allowable for the same reasons provided above.

Based on the above, reconsideration and withdrawal of the § 102 and § 103 rejections on claims 1-4, 10-13, and 15-20 is respectfully requested.

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New Claims 21-23

New claims 21-23 are allowable for the reasons set forth above and also for at least the following reasons.

New dependent claim 21 is dependent upon independent claim 1 and is allowable for the same reasons provided above.

New independent claim 22 recites: An electric drive system, comprising: an energy storage system (ESS) comprising a plurality of energy storage units; a power conversion system coupled to the ESS; an alternating current (AC) traction system coupled to the power conversion system for converting electric power to torque, wherein the AC traction system comprises: a first AC drive device for providing or receiving a first mechanical torque; and a second AC drive device for providing or receiving a second mechanical torque; a power device coupled to the AC traction system configured for splitting the first torque into the second torque and a third mechanical torque; and an energy management system (EMS) in communication with the ESS, the AC traction system, and the power conversion system for providing control signals. Support for this new claim is found in at least Figure 2 and paragraph [0034] of the application as filed. Thus, no new matter is added.

New independent claim 22 has incorporated the subject matter the Examiner indicated is allowable in original claim 11. In particular, the cited references do not disclose, teach, or suggest, "a power device coupled to the AC traction system

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configured for splitting the first torque into the second torque and a third mechanical torque," as recited in new independent claim 22. Therefore, allowance of new claim 22 is respectfully requested.

Claim 23 is dependent upon independent claim 22 and this claim is allowable for the same reasons provided above.

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Conclusion

In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application is in condition for allowance and a notice to that effect is respectfully requested.

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephonic interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

Should any fees be due, the Commissioner is hereby authorized to charge any fees in connection with this application and to credit any overpayments to Deposit Account No. 09-0470.

Respectfully submitted,
Jian Zhou et. al.

By: /Craig M. Drachtman/
Craig M. Drachtman
Registration No. 73,016

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One Palmer Square, Suite 325
Princeton, NJ 08542
609-454-3500

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7963353	B2	2011-06-21	Tatematsu et al.	
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	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou
	Art Unit	2837
	Examiner Name	CHAN, KAWING
	Attorney Docket Number	256975-2

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	CHAN, KAWING
Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Craig M. Drachtman/	Date (YYYY-MM-DD)	2016-09-16
Name/Print	Craig M. Drachtman	Registration Number	73,016

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	14094086
Filing Date:	02-Dec-2013
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Filer:	Craig Michael Drachtman/Colleen Maroney
Attorney Docket Number:	256975-2

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	26951621
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Craig Michael Drachtman/Colleen Maroney
Filer Authorized By:	Craig Michael Drachtman
Attorney Docket Number:	256975-2
Receipt Date:	16-SEP-2016
Filing Date:	02-DEC-2013
Time Stamp:	15:21:28
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	1929
Deposit Account	090470
Authorized User	MEAGHER EMANUEL LAKS GOLDBERG & LIAO LLP

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		256975-2_Response.pdf	131925 db9b2a65d066a591d7133949e61a4da52afa1f4c	yes	16
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	10	
	Applicant Arguments/Remarks Made in an Amendment		11	16	
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	256975_2_IDS.pdf	1035055 d6ee6d503d9056064b5e6b9fe67d77d97d1b7c6c	no	4
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	29999 1a8c93343f58b43f18442940 4356e88d6b26c8d6	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1196979		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/094,086	Filing Date 12/02/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **09/16/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
DEBORAH PORTER

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975-2	1896

131278 7590 06/30/2016

GE Ventures- Licensing
C/O Meagher Emanuel Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542

EXAMINER
CHAN, KAWING

ART UNIT	PAPER NUMBER
2837	

NOTIFICATION DATE	DELIVERY MODE
06/30/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

vivian.brandon@ge.com
gpo.mail@ge.com
gedocket@meagheremanuel.com

Office Action Summary	Application No. 14/094,086	Applicant(s) ZHOU ET AL.	
	Examiner KAWING CHAN	Art Unit 2837	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-4 and 9-20* is/are pending in the application.

5a) Of the above claim(s) *5-8* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-4,13 and 15-20* is/are rejected.

8)☒ Claim(s) *9-12 and 14* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☒ All b)☐ Some** c)☐ None of the:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *See Continuation Sheet*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

Continuation of Attachment(s) 2). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :07/23/15, 01/22/16 and 04/22/16.

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Election/Restrictions

2. Claims 5-8 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 06/01/16.

Claims 1-4 and 9-20 are pending for examination.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 13 and 20 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by King et al. (US 7,595,597 B2).

Regarding claim 1, King discloses an electric drive system (Fig. 4), comprising:

an energy storage system (ESS), comprising:

a first energy storage unit (Fig. 4: 110) configured for providing or receiving a first power; and

a second energy storage unit (Fig. 4: 130) configured for providing or receiving a second power;

a power conversion system (Fig. 4: 120) electrically coupled to the ESS for converting an input power to an output power, wherein the power conversion system comprises a power conversion device (i.e. converter), wherein the power conversion device comprises:

a first terminal (Fig. 4: 122) electrically coupled to the first energy storage unit;

a second terminal (Fig. 4: 128) electrically coupled to the second energy storage unit;

a third terminal (Fig. 4: 124); and

a fourth terminal (Fig. 4: 114);

an alternating current (AC) traction system (Fig. 4: 144) electrically coupled to the power conversion system for converting the output power of the power conversion system to mechanical torque, wherein the AC traction system comprises:

a first AC drive device (Fig. 4: 144) coupled to the third terminal of the power conversion device for providing or receiving a first mechanical torque; and

a second AC drive device (Fig. 4: 144) coupled to the fourth terminal of the power conversion device for providing or receiving a second mechanical torque; and

an energy management system (EMS) (Fig. 4: 120) in communication with the ESS, the AC traction system, and the power conversion system for providing control signals.

Regarding claim 2, King discloses the power conversion system further comprises:

a pre-charging switching device (Fig. 4: 152) electrically coupled between the first energy storage unit and the second energy storage unit for selectively providing a power flow path between the first energy storage unit and the second energy storage unit.

Regarding claim 3, King discloses the pre-charging switching device is a unidirectional switching device for providing a unidirectional power flow path for charging the second energy storage unit (Fig. 4: 132).

Regarding claim 4, King discloses the power conversion device is a single power conversion device (Fig. 4: 120).

Regarding claim 13, King discloses an energy management method, comprising:

enabling at least one of a first AC drive device and a second AC drive device based at least in part on an electric drive system speed signal (Col 5 line 35-55: power supplied to 147 via 124; thus power is supplied to the motor via inverter 144);

enabling at least one of a first energy storage unit and a second energy storage unit (Col 4 line 36-59); and

sending power control signals to a power conversion system for controlling power flow paths in an electric drive system (Col 5 line 19-55), wherein controlling the power flow paths comprises:

receiving or providing at least one input power by at least one of a first terminal and a second terminal of the power conversion system (Col 5 line 56-61 & Fig. 4: 122, 128); and

providing or receiving at least one output power by at least one of a third terminal and a fourth terminal of the power conversion system (Fig. 4: 124).

Regarding claim 20, King discloses enabling the second energy storage unit as an assistant to provide additional power when the first energy storage unit fails to provide a required power (Col 6 line 11-25).

Claim Rejections - 35 USC § 103

5. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 15 and 18-19 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over King et al. (US 7,595,597 B2) in view of Tang (US 2010/0222953 A1).

Regarding claim 15, King fails to disclose, but Tang teaches

calculating a first torque command signal and a second torque command signal through a torque distribution unit (Fig. 15: 1507, 1511, C_torque 1, C_torque 2); and

sending the first torque command signal and the second torque control signal to the first AC drive device and the second AC drive device (Fig. 15: 601, 603, 903, 909), respectively.

Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have modified the teachings of King with the teachings of Tang, since Tang suggests it would improve the efficiency of the motor output by limiting the torque output of each of the drive devices.

Regarding claim 18, Tang teaches the torque distribution unit comprises a torque distribution algorithm with a look up table defining high efficiency areas of two AC motors according to efficiency maps of each AC motor in the first AC drive device and the second AC drive device for reducing total loss (Fig. 15-16 & para [0068-0069]).

Regarding claim 19, Tang teaches changing an operating point of the first AC drive device through a transmission device for optimizing the torque distribution algorithm (Fig. 6: 607).

7. Claims 16-17 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over King et al. (US 7,595,597 B2) in view of Rineh et al. (US 2011/0057588 A1).

Regarding claim 16, King fails to disclose, but Rineh teaches

determining an operating mode of a propulsion system based at least in part on the electric drive system speed (para [0006]), wherein the operating mode comprises:

a normal mode (para [0005]: first mode—normal motor drive operation) comprising a starting mode, an accelerating mode, a cruising mode (inherently disclosed), and a braking mode (para [0005]: second mode);

Thus, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to have modified the teachings of King with the teachings of Rineh, since Rineh suggests it is advantage to determine the operation mode of the motor based on motor parameter, e.g. motor speed, so as to control the motor with suitable control scheme accordingly.

In addition, King discloses a fault-tolerate mode (e.g. limp-home mode in Col 8 line 8-10).

Regarding claim 17, King discloses enabling at least one of the first AC drive device and second AC drive device and at least one of the first energy storage unit and second energy storage unit in the fault-tolerate mode (Col 8 line 8-10: utilize battery 110 in limp-home mode).

Allowable Subject Matter

8. Claims 9-12 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAWING CHAN whose telephone number is (571)270-3909. The examiner can normally be reached on Mon-Fri 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shawki S. Ismail can be reached on 571-272-3985. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KAWING CHAN/

Primary Examiner, Art Unit 2837

Notice of References Cited	Application/Control No. 14/094,086	Applicant(s)/Patent Under Reexamination ZHOU ET AL.	
	Examiner KAWING CHAN	Art Unit 2837	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2009/0224720 A1	09-2009	Oyobe; Hichirosai	B60L11/18	318/801
*	B	US-7,595,597 B2	09-2009	King; Robert Dean	B60K6/28	318/106
*	C	US-7,583,053 B2	09-2009	Kamohara; Hideaki	B60K6/48	320/106
*	D	US-7,764,051 B2	07-2010	Ishikawa; Tetsuhiro	B60K6/26	322/29
*	E	US-2012/0091930 A1	04-2012	Takahashi; Kenji	B60L11/1861	318/139
*	F	US-2013/0041543 A1	02-2013	Takayanagi; Hiroyuki	B60K6/445	701/22
*	G	US-9,145,131 B2	09-2015	Watanabe; Kenta	B60K6/445	1/1
*	H	US-2011/0057588 A1	03-2011	Rineh; Ghodratollah Esmaeili	H02P3/18	318/380
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
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	Q					
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	**Art Unit**
	KAWING CHAN	2837

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/27/2016								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	N								
	6	N								
	7	N								
	8	N								
	9	O								
	10	O								
	11	O								
	12	O								
	13	✓								
	14	O								
	15	✓								
	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	✓								

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Page 345

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou et al.
Art Unit	2837
Examiner Name	Chan, Kawing
Attorney Docket Number	256975-2

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5549172		1996-08-27	MUTOH et al.	
	2	7595597	B2	2009-09-29	KING et al.	
	3	7839013	B2	2010-11-23	NAKAMURA et al.	
	4	7965510	B2	2011-06-21	SUZUKI et al.	
	5	8138720	B2	2012-03-20	SNYDER et al.	

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	1	20080218104	A1	2008-09-11	LUKIC et al.	

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Page 346

Receipt date: 07/23/2015	Application Number	14094086	14094086 - GAU: 2837
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-12-02	
	First Named Inventor	Jian Zhou et al.	
	Art Unit	2837	
	Examiner Name	Chan, Kawing	
	Attorney Docket Number	256975-2	

	2	20090242289	A1	2009-10-01	MURTY	
	3	20100222953	A1	2010-09-02	TANG	
	4	20120010041	A1	2012-01-12	SOLIMAN et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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	1	NORTHCOTT et al., "Electromagnetic Transient Simulation of Hybrid Electric Vehicles", Industrial Electronics, 2007. ISIE 2007. IEEE International Symposium on, Pages 833-838, 4-7 June 2007	☐

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Examiner Signature	/Kawing Chan/	Date Considered	04/29/2016

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Receipt date: 07/23/2015	Application Number	14094086 14094086 - GAU: 2837
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou et al.
	Art Unit	2837
	Examiner Name	Chan, Kawing
	Attorney Docket Number	256975-2

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Receipt date: 07/23/2015	Application Number	14094086	14094086 - GAU: 2837
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-12-02	
	First Named Inventor	Jian Zhou et al.	
	Art Unit	2837	
	Examiner Name	Chan, Kawing	
	Attorney Docket Number	256975-2	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/ptd47323/	Date (YYYY-MM-DD)	2015-07-22
Name/Print	Peter T. DiMauro	Registration Number	47,323

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	4	"14094086"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2016/04/29 12:40
S2	14	("8138720" | "20120010041" | "7839013" | "20040263099" | "20120010771" | "20080218104" | "20100222953" | "5549172" | "8016061" | "7595597" | "7965510" | "7688604" | "20120292985" | "20090242289").PN.	US-PGPUB; USPAT; USOCR	SAME	ON	2016/04/29 12:43
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S4	374	((Jian) near2 (Zhou)).INV.	US-PGPUB; USPAT; USOCR	SAME	ON	2016/04/29 12:46
S5	67	((Fei) near2 (Xu)).INV.	US-PGPUB; USPAT; USOCR	SAME	ON	2016/04/29 12:46
S6	228	((Dong) near2 (Liu)).INV.	US-PGPUB; USPAT; USOCR	SAME	ON	2016/04/29 12:46
S7	29	((Hai) near2 (Qiu)).INV.	US-PGPUB; USPAT; USOCR	SAME	ON	2016/04/29 12:46
S8	57	((Pengju) near2 (Kang)).INV.	US-PGPUB; USPAT; USOCR	SAME	ON	2016/04/29 12:46
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S22	8	"20120091930"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2016/06/12 09:26
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S24	5	"13378688"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	SAME	ON	2016/06/12 09:37
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S26	6	("2012/0010771").URPN.	USPAT	SAME	ON	2016/06/12 09:40
S27	7	("20070138998" | "20100224157" | "20120010771" | "20130030633" | "20130041543" | "6653745" | "7583053").PN. OR ("9145131").URPN.	US-PGPUB; USPAT; USOCR	SAME	ON	2016/06/12 09:42
S28	1	("2013/0041543").URPN.	USPAT	SAME	ON	2016/06/12 09:42

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SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/094,086	12/02/2013	318	2837	256975-2

APPLICANTS

General Electric Company, Schenectady, NY;

INVENTORS

Jian Zhou, Shanghai, CHINA;
Fei Xu, Shanghai, CHINA;
Dong Liu, Shanghai, CHINA;
Hai Qiu, Shanghai, CHINA;
Pengju Kang, Yorktown Heights, NY;

**** CONTINUING DATA **************************

**** FOREIGN APPLICATIONS **************************

CHINA 201210509493.2 12/03/2012

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

02/10/2014

Foreign Priority claimed ☑ Yes ☐ No 35 USC 119(a-d) conditions met ☑ Yes ☐ No Verified and Acknowledged /KAWING CHAN/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		CHINA	10	20	2

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GE Ventures- Licensing
C/O Meagher Emanuel Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542
UNITED STATES

TITLE

Electric Drive System and Energy Management Method

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Filing Date	2013-12-02
First Named Inventor	Jian Zhou et al.
Art Unit	2837
Examiner Name	Chan, Kawing
Attorney Docket Number	256975-2

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	1	8016061	B2	2011-09-13	JEON et al.	English Family member of CN101524967A

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	1	20040263099	A1	2004-12-30	MASLOV et al.	
	2	20120010771	A1	2012-01-12	KATO et al.	
	3	20120292985	A1	2012-11-22	SAKAI	

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	1	101237154	CN	A	2008-08-06	TSINGHUA UNIVERSITY		

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Receipt date: 01/22/2016	Application Number	14094086	14094086 - GAU: 2837
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-12-02	
	First Named Inventor	Jian Zhou et al.	
	Art Unit	2837	
	Examiner Name	Chan, Kawing	
	Attorney Docket Number	256975-2	

	2	101524967	CN	A	2009-09-09	HYUNDAI MOTOR COMPANY	See English Family member US8016061B2	
	3	101844511	CN	A	2010-09-29	BEIQI FUTIAN AUTOMOBILE CO., LTD		
	4	102009023340	DE	A1	2011-02-03	DAIMLER AG		
	5	2117106	EP	A1	2009-11-11	TOYOTA MOTOR CO LTD		
	6	2439120	EP	A1	2012-04-11	TOYOTA MOTOR CO LTD		
	7	2011001251	WO	A2	2011-01-06	TOYOTA MOTOR CO LTD		

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	NAPOLI et al., "Multiple-Input DC-DC Power Converter for Power-Flow Management in Hybrid Vehicles", Conference Record of the IEEE Industry Applications Conference. IAS Annual Meeting, Pittsburgh, Pennsylvania, USA, Volume No. 3, pp. 1578-1585, 13 October 2002	
	2	Unofficial English Translation of Chinese Office Action issued in connection with corresponding CN Application No. 201210509493.2 on July 13, 2015	
	3	A copy of European Search Report and Opinion issued in connection with corresponding EP Application No. 13195375.4 on December 21, 2015	

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Receipt date: 01/22/2016	Application Number	14094086	14094086 - GAU: 2837
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	First Named Inventor	Jian Zhou et al.	
	Art Unit	2837	
	Examiner Name	Chan, Kawing	
	Attorney Docket Number	256975-2	

EXAMINER SIGNATURE			
Examiner Signature	/Kawing Chan/	Date Considered	04/29/2016

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Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

Receipt date: 01/22/2016	Application Number	14094086	14094086 - GAU: 2837
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-12-02	
	First Named Inventor	Jian Zhou et al.	
	Art Unit	2837	
	Examiner Name	Chan, Kawing	
	Attorney Docket Number	256975-2	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/ptd47323/	Date (YYYY-MM-DD)	2016-01-20
Name/Print	Peter T. DiMauro	Registration Number	47,323

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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Toyota Motor Corp. v. Bunker Hill Technologies, LLC
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(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	Chan, Kawing
Attorney Docket Number	256975-2

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Receipt date: 04/22/2016	Application Number	14094086	14094086 - GAU: 2837
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-12-02	
	First Named Inventor	Jian Zhou	
	Art Unit	2837	
	Examiner Name	Chan, Kawing	
	Attorney Docket Number	256975-2	

	1	Unofficial English Translation of Chinese Office Action issued in connection with corresponding CN Application No. 201210509493.2 on March 11, 2016	

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Examiner Signature	/Kawing Chan/	Date Considered	04/29/2016

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Signature	/ptd47323/	Date (YYYY-MM-DD)	2016-04-15
Name/Print	Peter T. DiMauro	Registration Number	47,323

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IPR 2026-00333 BHILL Ex. 2004

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14094086	ZHOU ET AL.
	Examiner	Art Unit
	KAWING CHAN	2837

CPC- SEARCHED		
Symbol	Date	Examiner
h02p4/00 b60l11/005 b60l15/20	04/29/16	K.C.

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
318	500, 494	04/29/16	K.C.

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor search	04/29/16	K.C.
assignee search	04/29/16	K.C.

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/KAWING CHAN/ Primary Examiner.Art Unit 2837

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14094086	CTNF	06/30/2016	256975-2
	892	06/30/2016	256975-2
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	1449	06/30/2016	256975-2
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PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of: Jian Zhou et al. **Application No.:** 14/094,086 **Confirmation No.:** 1896 **Filed:** 12/02/2013 **For:** Electric Drive System and Energy Management Method **Group:** 2837 **Examiner:** Chan, Kawing	**Our File:** 256975-2 **Date:** June 1, 2016

RESTRICTION REQUIREMENT RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This response is being timely filed in response to the Restriction Requirement dated May 10, 2016. Applicants, by their attorneys, respond to the Restriction Requirement by electing without traverse as follows.

CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An electric drive system, comprising:

an energy storage system (ESS), comprising:

a first energy storage unit configured for providing or receiving a first power; and

a second energy storage unit configured for providing or receiving a second power;

a power conversion system electrically coupled to the ESS for converting an input power to an output power, wherein the power conversion system comprises a power conversion device, wherein the power conversion device comprises:

a first terminal electrically coupled to the first energy storage unit;

a second terminal electrically coupled to the second energy storage unit;

a third terminal; and

a fourth terminal;

an alternating current (AC) traction system electrically coupled to the power conversion system for converting the output power of the power conversion system to mechanical ~~torques~~ torque, wherein the AC traction system comprises:

a first AC drive device coupled to the third terminal of the power conversion device for providing or receiving a first mechanical torque;

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and

a second AC drive device coupled to the fourth terminal of the power conversion device for providing or receiving a second mechanical torque; and

an energy management system (EMS) in communication with the ESS, the AC traction system, and the power conversion system for providing control signals.

2. (Original) The electric drive system of claim 1, wherein the power conversion system further comprises:

a pre-charging switching device electrically coupled between the first energy storage unit and the second energy storage unit for selectively providing a power flow path between the first energy storage unit and the second energy storage unit.

3. (Original) The electric drive system of claim 2, wherein the pre-charging switching device is a unidirectional switching device for providing a unidirectional power flow path for charging the second energy storage unit.

4. (Original) The electric drive system of claim 1, wherein the power conversion device is a single power conversion device.

5. (Withdrawn) The electric drive system of claim 1, wherein the power conversion device further comprises:

a first power conversion device, the first power conversion device is electrically coupled to the first energy storage unit through the first terminal

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and electrically coupled to the first AC drive device through the third terminal; and

a second power conversion device coupled in parallel with the first power conversion device, the second power conversion device is electrically coupled to the second energy storage unit through the second terminal and electrically coupled to the second AC drive device through the fourth terminal.

6. (Withdrawn) The electric drive system of claim 1, wherein the power conversion device further comprises:

a first power conversion device electrically coupled to the first energy storage unit through the first terminal and electrically coupled to the second energy storage unit through the second terminal, and electrically coupled to the second AC drive device through the fourth terminal; and

a second power conversion device coupled in series with the first power conversion device, the second power conversion device is electrically coupled to the first AC drive device through the third terminal.

7. (Withdrawn Currently Amended) The electric drive system of claim 1, wherein:

the first AC drive device comprises:

at least one of an induction motor (IM) and an interior permanent motor (IPM) operated as a first AC motor; and

a first DC/ AC inverter electrically coupled to the first AC motor for providing AC power to the first AC motor; and ~~, wherein~~

the second AC drive device comprises:

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at least one of the IM and the IPM operated as a second AC motor; and

a second DC/AC inverter electrically coupled to the second AC motor for providing AC power to the second AC motor.

8. (Withdrawn) The electric drive system of claim 1, wherein:

the first AC drive device is configured to independently provide the first mechanical torque to a first load; and

the second AC drive device is configured to independently provide the second mechanical torque to a second load.

9. (Currently Amended) The electric drive system of claim 1, further comprising a power split device mechanically coupled between the AC traction system and a load wherein the power split device comprises:

a first mechanical terminal mechanically coupled to the first AC drive device for receiving a first mechanical torque provided from the first AC drive device;

a second mechanical terminal mechanically coupled to the second AC drive device for receiving a second mechanical torque provided from the second AC drive device; and

a third mechanical terminal mechanically coupled to the load for providing a third mechanical torque to the load, the third mechanical torque [[is]] <u>being</u> a combination of the first mechanical torque and the second mechanical torque by the power split device.

10. (Currently Amended) The electric drive system of claim 9, wherein the power

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split device is configured for splitting [[a]] the third mechanical torque into [[a]] the first mechanical torque and [[a]] second mechanical torque, wherein:

the third mechanical terminal is configured for receiving the third mechanical torque from the load;

the first mechanical terminal is configured for providing the first mechanical torque which is converted into electric power for charging the ESS; and

the second mechanical terminal is configured for providing the second mechanical torque which is converted into electric power for charging the ESS.

11. (Currently Amended) The electric drive system of claim 9, wherein the power split device is configured for splitting [[a]] the first mechanical torque into [[a]] the second mechanical torque and [[a]] third mechanical torque, wherein:

the first mechanical terminal is configured for receiving the first mechanical torque provided from the first AC drive device;

the second mechanical terminal is configured for providing the second mechanical torque to the second AC drive device and converting the second mechanical torque into electric power for charging the ESS; and

the third mechanical terminal is configured for providing the third mechanical torque to the load.

12. (Original) The electric drive system of claim 9, further comprising:

a transmission device mechanically coupled between the AC traction system and the power split device for matching output speed of the AC

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traction system with an electric drive system speed.

13. (Original) An energy management method, comprising:

enabling at least one of a first AC drive device and a second AC drive device based at least in part on an electric drive system speed signal;

enabling at least one of a first energy storage unit and a second energy storage unit; and

sending power control signals to a power conversion system for controlling power flow paths in an electric drive system, wherein controlling the power flow paths comprises:

receiving or providing at least one input power by at least one of a first terminal and a second terminal of the power conversion system; and

providing or receiving at least one output power by at least one of a third terminal and a fourth terminal of the power conversion system.

14. (Original) The method of claim 13, wherein controlling the power flow paths further comprises:

converting an electric power generated from an energy storage system (ESS) into a first mechanical torque by the first AC drive device;

splitting the first mechanical torque into a second mechanical torque and a third mechanical torque;

providing the second mechanical torque to the second AC drive device and converting the second mechanical torque into electric power for charging a second energy storage unit; and

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providing the third mechanical torque to the load.

15. (Original) The method of claim 13, further comprising:

calculating a first torque command signal and a second torque command signal through a torque distribution unit; and

sending the first torque command signal and the second torque control signal to the first AC drive device and the second AC drive device, respectively.

16. (Currently Amended) The method of claim 13, further comprising:

determining an operating mode of a propulsion system based at least in part on the electric drive system speed, wherein the operating mode comprises:

a normal mode comprising a starting mode, an accelerating mode, a cruising mode, and a braking mode; and

a fault-tolerate mode.

17. (Original) The method of claim 16, further comprising one of the following:

enabling at least one of the first AC drive device and second AC drive device and at least one of the first energy storage unit and second energy storage unit in the fault-tolerate mode;

enabling the second AC drive device when a required power P_{req} is within the ability of the second AC drive device in the starting mode;

enabling the first AC drive device when P_{req} exceeds the ability of the second AC drive device in the starting mode;

enabling both of the first AC drive device and second AC drive device

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in the accelerating mode;

enabling at least one of the first AC drive device and second AC drive device in the cruising mode; and

enabling both of the first AC drive device and second AC drive device in the braking mode.

18. (Original) The method of claim 15, wherein the torque distribution unit comprises a torque distribution algorithm with a look up table defining high efficiency areas of two AC motors according to efficiency maps of each AC motor in the first AC drive device and the second AC drive device for reducing total loss.

19. (Original) The method of claim 18, further comprising changing an operating point of the first AC drive device through a transmission device for optimizing the torque distribution algorithm.

20. (Original) The method of claim 13, further comprising:

enabling the second energy storage unit as an assistant to provide additional power when the first energy storage unit fails to provide a required power.

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REMARKS

The Examiner is requiring restriction between one of the following groups:

I. Species I, drawn to the embodiment of Figure 1

II. Species II, drawn to the embodiment of Figure 2

III. Species III, drawn to the embodiment of Figure 3

IV. Species IV, drawn to the embodiment of Figure 4

V. Species V, drawn to the embodiment of Figure 5

Applicants respectfully assert independent claims 1 and 13, as well as dependent claims 2-3, 15-18, and 20, are generic.

Applicants elect Species II without traverse. Species II encompasses claims 9-12, 14, and 19. Although this election is made without traverse, Applicants specifically reserve the right to rejoinder of the claims of Species I and III-V, and withdrawal of the Restriction Requirement upon allowance of a claim of Species II and amendment of the claims of Species I and III-V to include all limitations of the allowed claim, pursuant to MPEP § 821.04. Applicants also specifically reserve the right to file the withdrawn claims of Species I and III-V in a divisional or continuation application.

Applicants respectfully request that a Notice of Allowance of the elected claims be timely issued in this case.

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 375

Applicants believe that no additional fees are due. However, should any fees be due, the Commissioner is hereby authorized to charge any fees in connection with this application and to credit any overpayments to Deposit Account No. 09-0470.

Respectfully submitted,
Jian Zhou et al.

By: /Craig M. Drachtman/
Craig M. Drachtman
Registration No. 73,016

Meagher Emanuel
Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542
609-454-3500

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 376

Electronic Acknowledgement Receipt

EFS ID:	25937861
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	131278
Filer:	Craig Michael Drachtman/Colleen maroney
Filer Authorized By:	Craig Michael Drachtman
Attorney Docket Number:	256975-2
Receipt Date:	01-JUN-2016
Filing Date:	02-DEC-2013
Time Stamp:	14:52:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		256975_2_ResposnetoRR.pdf	98614 5d5fe1e591712d2743220b114004bbcc34ce307e	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response to Election / Restriction Filed	1	1
	Claims	2	9
	Applicant Arguments/Remarks Made in an Amendment	10	11
Warnings:			
Information:			
	Total Files Size (in bytes):	98614	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/094,086	Filing Date 12/02/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **06/01/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
ANTHONY WILLIAMS

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/094,086	12/02/2013	Jian Zhou	256975	1896

131278 7590 05/10/2016

GE Ventures- Licensing
C/O Meagher Emanuel Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542

EXAMINER
CHAN, KAWING

ART UNIT	PAPER NUMBER
2837	

NOTIFICATION DATE	DELIVERY MODE
05/10/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

vivian.brandon@ge.com
gpo.mail@ge.com
gedocket@meagheremanuel.com

Office Action Summary	Application No. 14/094,086	Applicant(s) ZHOU ET AL.	
	Examiner KAWING CHAN	Art Unit 2837	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-20* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☐ Claim(s) _____ is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☒ Claim(s) *1-20* are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Election/Restrictions

2. This application contains claims directed to the following patentably distinct species:

- Species I: Fig. 1
- Species II: Fig. 2
- Species III: Fig. 3
- Species IV: Fig. 4
- Species V: Fig. 5

3. The species are independent or distinct because the identified Species are capable of use together, or have structurally different design. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable.

There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply:

- Different search strategies would need to apply for the identified Species;

- Prior art references applicable to one Species would not be able to use in the others.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species**, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the

evidence or admission may be used in a rejection under 35 U.S.C. 103 or pre-AIA 35 U.S.C. 103(a) of the other species.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAWING CHAN whose telephone number is (571)270-3909. The examiner can normally be reached on Mon-Fri 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shawki S. Ismail can be reached on 571-272-3985. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KAWING CHAN/

Primary Examiner, Art Unit 2837

To: vivian.brandon@ge.com,gpo.mail@ge.com,gedocket@meagheremanuel.com
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 131278

May 10, 2016 05:27:11 AM

Dear PAIR Customer:

GE Ventures- Licensing
C/O Meagher Emanuel Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 131278 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
14094086	CTRS	05/10/2016	256975

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	Chan, Kawing
Attorney Docket Number	256975-2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7688604	B2	2010-03-30	OYOBE et al.	English Family Member of CN101208855A

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	101208855	CN	A	2008-06-25	TOYOTA MOTOR CO., LTD et al.	See English Family Member US7688604B2	

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou
	Art Unit	2837
	Examiner Name	Chan, Kawing
	Attorney Docket Number	256975-2

	1	Unofficial English Translation of Chinese Office Action issued in connection with corresponding CN Application No. 201210509493.2 on March 11, 2016

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou
Art Unit	2837
Examiner Name	Chan, Kawing
Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/ptd47323/	Date (YYYY-MM-DD)	2016-04-15
Name/Print	Peter T. DiMauro	Registration Number	47,323

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	25503025
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	52082
Filer:	Peter DiMauro/Jackie Sutton
Filer Authorized By:	Peter DiMauro
Attorney Docket Number:	256975
Receipt Date:	22-APR-2016
Filing Date:	02-DEC-2013
Time Stamp:	08:20:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	256975-2_US_IDS_Form.pdf	612269 7ec3fb65f1ddcf9ecbd322549c6cb62c84a81f7d	no	4

Warnings:	
Information:	

2	Non Patent Literature	256975-2_US_IDS_NPL_CN_OA.pdf	12333513 5a652dd0307ba5ca7c0a923d4325262188f002d6	no	21
Warnings:					
Information:					
3	Foreign Reference	256975-2_US_IDS_Ref_CN101208855.pdf	6192739 dc86660a0b595bc560d854ab815899b78ecc35ec	no	43
Warnings:					
Information:					
			Total Files Size (in bytes):	19138521	

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/094,086	12/02/2013	Jian Zhou	256975

CONFIRMATION NO. 1896

POA ACCEPTANCE LETTER

131278
GE Ventures- Licensing
C/O Meagher Emanuel Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542

OC000000082332646

Date Mailed: 04/21/2016

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/12/2016.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/tgebre/

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 392

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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/094,086	12/02/2013	Jian Zhou	256975

CONFIRMATION NO. 1896

POWER OF ATTORNEY NOTICE

52082
General Electric Company
GE Global Patent Operation
3135 Easton Turnpike
Fairfield, CT 06828

OC000000082332529

Date Mailed: 04/21/2016

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/12/2016.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/tgebre/

To: vivian.brandon@ge.com,gpo.mail@ge.com,gedocket@meagheremanuel.com
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 131278

Apr 21, 2016 05:34:17 AM

Dear PAIR Customer:

GE Ventures- Licensing
C/O Meagher Emanuel Laks Goldberg & Liao, LLP
One Palmer Square, Suite 325
Princeton, NJ 08542
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 131278 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
14094086	N570	04/21/2016	256975
	N570	04/21/2016	256975

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

PTO/SB/81 (01-09)
Approved for use through 11/30/2011. OMB 0651-0035
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POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

Application Number	14/094086
Filing Date	12-02-2013
First Named Inventor	Jian Zhou
Title	Electric Drive System and Energy ...
Art Unit	2837
Examiner Name	Kawing Chan
Attorney Docket Number	256975-2

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

131278

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified application to:

☒ The address associated with the above-mentioned Customer Number.

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the:

☐ Applicant/inventor.

OR

☒ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____.

SIGNATURE of Applicant or Assignee of Record

Signature	/ptd47323/	Date	April 7, 2016
Name	Peter T. DiMauro	Telephone	203-366-7465
Title and Company	Senior Patent Agent and Authorized Signatory for General Electric Company		

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☒ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PTO/SB/96 (07-09)
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: General Electric Company

Application No./Patent No.: 14/094,086 Filed/Issue Date: 12-02-2013

Titled: Electric Drive System and Energy Management Method

General Electric Company , a Corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 032484, Frame 0482, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/ptd47323/ April 7, 2016

Signature Date

Peter T. DiMauro Senior Patent Agent and Authorized Signatory for General Electric Company

Printed or Typed Name Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	25422063
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	52082
Filer:	Peter DiMauro/Ann DiSarro
Filer Authorized By:	Peter DiMauro
Attorney Docket Number:	256975
Receipt Date:	12-APR-2016
Filing Date:	02-DEC-2013
Time Stamp:	09:45:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	256975-2_US_POA_page_1and 2.pdf	100124 007e439eed1685e1612f6eb3205731bc6e6 2c000	no	2

Warnings:	
Information:	

Total Files Size (in bytes):	100124

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08a (01-10)
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou et al.
Art Unit	2837
Examiner Name	Chan, Kawing
Attorney Docket Number	256975-2

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8016061	B2	2011-09-13	JEON et al.	English Family member of CN101524967A

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20040263099	A1	2004-12-30	MASLOV et al.	
	2	20120010771	A1	2012-01-12	KATO et al.	
	3	20120292985	A1	2012-11-22	SAKAI	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	101237154	CN	A	2008-08-06	TSINGHUA UNIVERSITY		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou et al.
	Art Unit	2837
	Examiner Name	Chan, Kawing
	Attorney Docket Number	256975-2

	2	101524967	CN	A	2009-09-09	HYUNDAI MOTOR COMPANY	See English Family member US8016061B2	
	3	101844511	CN	A	2010-09-29	BEIQI FUTIAN AUTOMOBILE CO., LTD		
	4	102009023340	DE	A1	2011-02-03	DAIMLER AG		
	5	2117106	EP	A1	2009-11-11	TOYOTA MOTOR CO LTD		
	6	2439120	EP	A1	2012-04-11	TOYOTA MOTOR CO LTD		
	7	2011001251	WO	A2	2011-01-06	TOYOTA MOTOR CO LTD		

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	NAPOLI et al., "Multiple-Input DC-DC Power Converter for Power-Flow Management in Hybrid Vehicles", Conference Record of the IEEE Industry Applications Conference. IAS Annual Meeting, Pittsburgh, Pennsylvania, USA, Volume No. 3, pp. 1578-1585, 13 October 2002	
	2	Unofficial English Translation of Chinese Office Action issued in connection with corresponding CN Application No. 201210509493.2 on July 13, 2015	
	3	A copy of European Search Report and Opinion issued in connection with corresponding EP Application No. 13195375.4 on December 21, 2015	

If you wish to add additional non-patent literature document citation information please click the Add button Add

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou et al.
	Art Unit	2837
	Examiner Name	Chan, Kawing
	Attorney Docket Number	256975-2

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14094086
	Filing Date	2013-12-02
	First Named Inventor	Jian Zhou et al.
	Art Unit	2837
	Examiner Name	Chan, Kawing
	Attorney Docket Number	256975-2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/ptd47323/	Date (YYYY-MM-DD)	2016-01-20
Name/Print	Peter T. DiMauro	Registration Number	47,323

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	24670023
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	52082
Filer:	Peter DiMauro/Ann DiSarro
Filer Authorized By:	Peter DiMauro
Attorney Docket Number:	256975
Receipt Date:	22-JAN-2016
Filing Date:	02-DEC-2013
Time Stamp:	14:11:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	256975-2_US_IDS_Form.pdf	613102 c10a4c6c01ff4144067b15ed83d4c793b1656e18	no	5

Warnings:	
Information:	

2	Non Patent Literature	256975-2_US_IDS_NPL1_Napoli.pdf	1303169 daa6efa52eb3a88ec53543bf91adee7baf0713da	no	8
Warnings:					
Information:					
3	Non Patent Literature	256975-2_US_IDS_NPL2_CN_OA.pdf	4254346 e80482e9a4b0cbe6dd5cdd4a2e1ac399fb692f32	no	21
Warnings:					
Information:					
4	Non Patent Literature	256975-2_US_IDS_NPL3_EP_SR.pdf	408149 7a2c5bebf4163d187e4bdb9dceb96c8e890de30c	no	10
Warnings:					
Information:					
5	Foreign Reference	256975-2_US_IDS_Ref1_CN101237154.pdf	1693091 b98bbb60eb730ef7e3d9c525b4ac1c7726e5f268	no	15
Warnings:					
Information:					
6	Foreign Reference	256975-2_US_IDS_Ref2_CN101524967.pdf	4527986 42c0ad338a333768913acf03357abacd30ffa83d	no	34
Warnings:					
Information:					
7	Foreign Reference	256975-2_US_IDS_Ref3_CN101844511.pdf	1166125 9cabba9fc9c52bdc885f6cc460dec6aeab17dd6e	no	10
Warnings:					
Information:					
8	Foreign Reference	256975-2_US_IDS_Ref4_DE102009023340.pdf	750608 940c0c57a1340a0c87833f583e4bdf2086576db4	no	11
Warnings:					
Information:					
9	Foreign Reference	256975-2_US_IDS_Ref5_EP2117106.pdf	2198749 ff1605669c2c6fd4bc01243a752ebdf02ca04632	no	44
Warnings:					
Information:					
10	Foreign Reference	256975-2_US_IDS_Ref6_EP2439120.pdf	2932871 f71cd0491bde2ddd08f4ac495bf6077cc2640c38	no	37
Warnings:					
Information:					

11	Non Patent Literature	256975-2_US_IDS_Ref7_WO2011001251.pdf	2290078 8b0e235b4c585d78b560fe13d2b6d3d30fc96a1c	no	52

Warnings:	
Information:	
Total Files Size (in bytes):	22138274

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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证　明

本证明之附件是向本局提交的下列专利申请文件副本。

申　　请　　号：201210509493.2

申　请　类　型：发明专利

发明 创造 名称：电驱动系统及其能量管理方法

申　　请　　日：2012 年 12 月 03 日

申　　请　　人：通用电气公司

发明人或设计人：周健、许飞、刘栋、邱海、康鹏举

局长

申长雨

2015 年 10 月 12 日

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权　利　要　求　书

1. 一种电驱动系统，其特征在于：

该电驱动系统包括电能存储系统，电能转换系统，交流传动系统和能量管理系统；

该电能存储系统包括第一电能存储单元和第二电能存储单元，该第一电能存储单元用于提供或者接收第一电能，该第二电能存储单元用于提供或者接收第二电能；

该电能转换系统与该电能存储系统连接，该电能转换系统用于将一种输入电能转换成一种输出电能，该电能转换系统包括电能转换装置，该电能转换装置包括第一端口，第二端口，第三端口和第四端口，该第一端口与该第一电能存储单元连接，该第二端口与该第二电能存储单元连接；

该交流传动系统与该电能转换系统连接，该交流传动系统用于将该电能转换系统的输出电能转换成机械转矩，该交流传动系统包括第一交流驱动装置和第二交流驱动装置，该第一交流驱动装置与该电能转换装置的第三端口连接，该第一交流驱动装置用于提供或者接收第一机械转矩，该第二交流驱动装置与该电能转换装置的第四端口连接，该第二交流驱动装置用于提供或者接收第二机械转矩；

该能量管理系统与该电能存储系统，该交流传动系统和该电能转换系统通讯，该能量管理系统用于提供控制信号。

2. 如权利要求 1 所述的电驱动系统，其中：该电驱动系统包括预充电开关装置，该预充电开关装置连接在该第一电能存储单元和该第二电能存储单元之间，该预充电开关装置用于在该第一电能存储单元和该第二电能存储单元之间提供电能流通路径。

3. 如权利要求 1 所述的电驱动系统，其中：该电能转换装置包括单独的电能转换装置。

4. 如权利要求 1 所述的电驱动系统，其中：该电能转换装置包括第一电能转换装置和第二电能转换装置，该第一电能转换装置通过该第一端口与

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该第一电能存储单元连接，该第一电能转换装置通过该第三端口与该第一交流驱动装置连接；该第二电能转换装置与该第一电能转换装置并联连接，该第二电能转换装置通过该第二端口与该第二电能存储单元连接，该第二电能转换装置通过该第四端口与该第二交流驱动装置连接。

5. 如权利要求 1 所述的电驱动系统，其中：该电能转换装置包括第一电能转换装置和第二电能转换装置，该第一电能转换装置通过该第一端口与该第一电能存储单元连接，该第一电能转换装置通过该第二端口与该第二电能存储单元连接，该第一电能转换装置通过该第四端口与该第二交流驱动装置连接；该第二电能转换装置与该第一电能转换装置串联连接，该第二电能转换装置通过该第三端口与该第一交流驱动装置连接。

6. 如权利要求 1 所述的电驱动系统，其中：该第一交流驱动装置包括第一交流电机和第一直流/交流逆变器，该第一交流电机包括感应电机和永磁电机其中之一，该第一直流/交流逆变器与该第一交流电机连接，该第一直流/交流逆变器用于给该第一交流电机提供交流电；该第二交流驱动装置包括第二交流电机和第二直流/交流逆变器，该第二交流电机包括感应电机和永磁电机其中之一，该第二直流/交流逆变器与该第二交流电机连接，该第二直流/交流逆变器用于给该第二交流电机提供交流电。

7. 如权利要求 6 所述的电驱动系统，其中：该第一交流驱动装置用于独立给第一负载提供机械转矩；该第二交流驱动装置用于独立给第二负载提供机械转矩。

8. 如权利要求 1 所述的电驱动系统，其包括功率分配装置，该功率分配装置连接在该交流传动系统和负载之间，该功率分配装置包括：第一机械端口，第二机械端口和第三机械端口，该第一机械端口与该第一交流驱动装置连接，该第一机械端口用于接收来自该第一交流驱动装置的第一机械转矩；该第二机械端口与该第二交流驱动装置连接，该第二机械端口用于接收来自该第二交流驱动装置的第二机械转矩；该第三机械端口与该负载连接，该第三机械端口用于提供第三机械转矩给该负载，该功率分配装置用于将该第一机械转矩和该第二机械转矩进行结合，并输出

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由该第一机械转矩和该第二机械转矩结合得到的该第三机械转矩。

9. 如权利要求 8 所述的电驱动系统，其中：该功率分配装置用于将该第三机械转矩分解为该第一机械转矩和该第二机械转矩，该第三机械端口用于接收来自负载提供的该第三机械转矩；该第一机械端口用于给该第一交流驱动装置提供该第一机械转矩，该第一机械转矩被转换为电功率以给该电能存储系统充电；该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电。

10. 如权利要求 8 所述的电驱动系统，其中：该功率分配装置用于将该第一机械转矩分解为该第二机械转矩和该第三机械转矩，该第一机械端口用于接收来自该第一交流驱动装置提供的该第一机械转矩；该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电；该第三机械端口用于给该负载提供该第三机械转矩。

11. 一种能量管理方法，其特征在于：该方法至少包括如下步骤：

至少根据测量到的电驱动系统的速度启用第一交流驱动装置和第二交流驱动装置当中至少一个装置；

启用第一电能存储单元和第二电能存储单元当中至少一个单元；以及

发送电能控制信号给电能转换系统，该电能控制信号用于控制电驱动系统中的电能流通路径，控制该电能流通路径的过程包括如下步骤：至少由该电能转换装置的第一端口和第二端口当中一个端口提供功率给该电能转换系统或者从该电能转换系统接收功率；以及至少由该电能转换装置的第三端口和第四端口当中一个端口提供功率给该电能转换系统或者从该电能转换系统接收功率。

12. 如权利要求 11 所述的能量管理方法，其中：该控制电能流通路径的过程包括如下步骤：

将电能存储系统产生的电能通过该第一交流驱动装置转换成第一机械转矩；

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通过功率分配装置将该第一机械转矩分解为第二机械转矩和第三机械转矩；

将该第二机械转矩提供给该第二交流驱动装置，该第二机械转矩被转换为电功率以给该第二电能存储单元充电；以及

将该第三机械转矩提供给负载。

13. 如权利要求 11 所述的能量管理方法，其中：该能量管理方法包括：

通过转矩分配单元计算得到第一转矩控制信号和第二转矩控制信号；以及

将该第一转矩控制信号和该第二转矩控制信号分别发送给该第一交流驱动装置和该第二交流驱动装置。

14. 如权利要求 13 所述的能量管理方法，其中：该转矩分配单元包括转矩分配算法，该转矩分配算法根据该第一驱动装置和该第二驱动装置中的第一交流电机和第二交流电机的效率曲线图制定出查询表格，该查询表格定义了该第一交流电机和该第二交流电机运行的高效率区域。

15. 如权利要求 11 所述的能量管理方法，至少包括以下步骤中的一者：

在容错模式下，启用该第一交流驱动装置和该第二交流驱动装置中至少一个装置，并启用该第一存储单元和该第二存储单元至少一个单元；

在启动模式下，当需求功率在该第二交流驱动装置能力范围内时启用该第二交流驱动装置；

在启动模式下，当该需求功率超出该第二交流驱动装置能力范围时启用该第一交流驱动装置；

在加速模式下，启用该第一交流驱动装置和该第二交流驱动装置；

在巡航模式下，启用该第一交流驱动装置和该第二交流驱动装置至少一个装置；以及

在制动模式下，启用该第一交流驱动装置和该第二交流驱动装置。

16. 一种电驱动系统，其特征在于：

该电驱动系统包括电能存储系统，电能转换系统，交流传动系统，功率分配装置和能量管理系统；

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该电能存储系统至少包括一个电能存储单元，该电能存储系统用于提供或接收电能；

该电能转换系统与该电能存储系统连接，该电能转换系统用于将一种输入电能转换成一种输出电能；

该交流传动系统与该电能转换系统连接，该交流传动系统用于将该电能转换系统的输出电能转换成机械转矩，该交流传动系统包括第一交流驱动装置和第二交流驱动装置，该第一交流驱动装置和该第二交流驱动装置与该电能转换系统连接，该第一交流驱动装置用于提供或者接收第一机械转矩，该第二交流驱动装置用于提供或者接收第二机械转矩；

该能量管理系统与该电能存储系统，该交流传动系统和该电能转换系统通讯，该能量管理系统用于提供控制信号；

该功率分配装置连接在该交流传动系统和负载之间，该功率分配装置包括第一机械端口，第二机械端口和第三机械端口，该第一机械端口与该第一交流驱动装置连接，该第二机械端口与该第二交流驱动装置连接，该第三机械端口与该负载连接，该功率分配装置用于将该第一机械转矩分解为该第二机械转矩和该第三机械转矩，该第一机械端口用于接收来自该第一交流驱动装置提供的该第一机械转矩；该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电；该第三机械端口用于给该负载提供该第三机械转矩。

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说　　明　　书

电驱动系统及其能量管理方法

技术领域

本发明公开的实施方式涉及电驱动系统及其能量管理方法，可用于多种动力系统例如电动汽车系统。

背景技术

随着能源危机和化石燃料尾气造成的环境污染问题的加重，电动汽车系统受到越来越多的关注。在电动汽车系统中，至少部分化石燃料可被诸如铅酸蓄电池，飞轮储能装置，燃料电池等能源代替。电驱动系统是电动汽车系统的重要组成部分。在一些电驱动系统中，多种交流电机例如感应电机，永磁电机，开关磁阻电机常用于将电能转换为机械转矩。为保证电动汽车系统具备高效率和高性价比等特征，需选择合适的电源，合适的电机以及合适的连接方式。

目前，大多数的电驱动系统包括以下几种结构，一种为一个单电能存储单元和单电机，另一种为双电能存储单元和单电机。然而，一方面，由于受到电能存储单元自身充/放电特性的限制，电能存储单元往往具有能量低，充电效率低，寿命短等缺点，因此单电能存储单元不能同时满足能量和需求功率。另一方面，单电机也不能保证在整个工作区间内都保持高效率运行。现有的电动汽车系统为了保证电动汽车可拥有加速快，行驶里程长等特点，存在电驱动系统体积大，成本高，效率低等问题。

因此，有必要提供一种改进的系统和方法来解决上述技术问题。

发明内容

鉴于上面提及的技术问题，本发明的一个方面在于提供一种改进的电驱动系统。该电驱动系统包括电能存储系统，电能转换系统，交流传动系统和能量管理系统。该电能存储系统包括第一电能存储单元和第二电能存储单元，该第一电能存储单元用于提供或者接收第一电能，该第二电能存储单元用于提供或者接收第二电能。该电能转换系统与该电能存储系统连接，该电能转

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换系统用于将一种输入电能转换成一种输出电能，该电能转换系统包括电能转换装置，该电能转换装置包括第一端口，第二端口，第三端口和第四端口，该第一端口与该第一电能存储单元连接，该第二端口与该第二电能存储单元连接。该交流传动系统与该电能转换系统连接，该交流传动系统用于将该电能转换系统的输出电能转换成机械转矩，该交流传动系统包括第一交流驱动装置和第二交流驱动装置，该第一交流驱动装置与该电能转换装置的第三端口连接，该第一交流驱动装置用于提供或者接收第一机械转矩，该第二交流驱动装置与该电能转换装置的第四端口连接，该第二交流驱动装置用于提供或者接收第二机械转矩；该能量管理系统与该电能存储系统，该交流传动系统和该电能转换系统通讯，该能量管理系统用于提供控制信号。

如上所述改进的电驱动系统进一步包括预充电开关装置，该预充电开关装置连接在该第一电能存储单元和该第二电能存储单元之间，该预充电开关装置用于在该第一电能存储单元和该第二电能存储单元之间提供电能流通路径。

如上所述改进的电驱动系统，其中该电能转换装置包括单独的电能转换装置。

如上所述改进的电驱动系统，其中该电能转换装置包括第一电能转换装置和第二电能转换装置，该第一电能转换装置通过该第一端口与该第一电能存储单元连接，该第一电能转换装置通过该第三端口与该第一交流驱动装置连接；该第二电能转换装置与该第一电能转换装置并联连接，该第二电能转换装置通过该第二端口与该第二电能存储单元连接，该第二电能转换装置通过该第四端口与该第二交流驱动装置连接。

如上所述改进的电驱动系统，其中该电能转换装置包括第一电能转换装置和第二电能转换装置，该第一电能转换装置通过该第一端口与该第一电能存储单元连接，该第一电能转换装置通过该第二端口与该第二电能存储单元连接，该第一电能转换装置通过该第四端口与该第二交流驱动装置连接；该第二电能转换装置与该第一电能转换装置串联连接，该第二电能转换装置通过该第三端口与该第一交流驱动装置连接。

如上所述改进的电驱动系统，其中该第一交流驱动装置包括第一交流电机和第一直流/交流逆变器，该第一交流电机包括感应电机和永磁电机其中之一，该第一直流/交流逆变器与该第一交流电机连接，该第一直流/交流逆变器

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用于给该第一交流电机提供交流电；该第二交流驱动装置包括第二交流电机和第二直流/交流逆变器，该第二交流电机包括感应电机和永磁电机其中之一，该第二直流/交流逆变器与该第二交流电机连接，该第二直流/交流逆变器用于给该第二交流电机提供交流电。

如上所述改进的电驱动系统，其中该第一交流驱动装置用于独立地给第一负载提供机械转矩；该第二交流驱动装置用于独立地给第二负载提供机械转矩。

如上所述改进的电驱动系统进一步包括功率分配装置，该功率分配装置连接在该交流传动系统和负载之间，该功率分配装置包括：第一机械端口，第二机械端口和第三机械端口，该第一机械端口与该第一交流驱动装置连接，该第一机械端口用于接收来自该第一交流驱动装置的第一机械转矩；该第二机械端口与该第二交流驱动装置连接，该第二机械端口用于接收来自该第二交流驱动装置的第二机械转矩；该第三机械端口与该负载连接，该第三机械端口用于提供第三机械转矩给该负载，该功率分配装置用于将该第一机械转矩和该第二机械转矩进行结合，并输出由该第一机械转矩和该第二机械转矩结合得到的该第三机械转矩。

如上所述改进的电驱动系统，其中该功率分配装置用于将该第三机械转矩分解为该第一机械转矩和该第二机械转矩，该第三机械端口用于接收来自负载提供的该第三机械转矩；该第一机械端口用于给该第一交流驱动装置提供该第一机械转矩，该第一机械转矩被转换为电功率以给该电能存储系统充电；该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电。

如上所述改进的电驱动系统，其中该功率分配装置用于将该第一机械转矩分解为该第二机械转矩和该第三机械转矩，该第一机械端口用于接收来自该第一交流驱动装置提供的该第一机械转矩；该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电；该第三机械端口用于给该负载提供该第三机械转矩。

本发明的另一个方面在于提供一种能量管理方法，该方法至少包括如下步骤：至少根据测量到的电驱动系统的速度启用第一交流驱动装置和第二交流驱动装置当中至少一个装置。启用第一电能存储单元和第二电能存储单元当中至少一个单元。以及发送电能控制信号给电能转换系统，该电能控制信

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号用于控制电驱动系统中的电能流通路径，控制该电能流通路径的过程包括如下步骤：至少由电能转换装置的第一端口和第二端口当中一个端口提供功率给该电能转换系统或者从该电能转换系统接收功率；以及至少由该电能转换装置的第三端口和第四端口当中一个端口提供功率给该电能转换系统或者从该电能转换系统接收功率。

如上所述的能量管理方法，其中该控制电能流通路径的过程包括如下步骤：将电能存储系统产生的电能通过该第一交流驱动装置转换成第一机械转矩。通过功率分配装置将该第一机械转矩分解为第二机械转矩和第三机械转矩。将该第二机械转矩提供给该第二交流驱动装置，该第二机械转矩被转换为电功率以给该第二电能存储单元充电。以及将该第三机械转矩提供给负载。

如上所述的能量管理方法，其中该能量管理方法包括通过转矩分配单元计算得到第一转矩控制信号和第二转矩控制信号。以及将该第一转矩控制信号和该第二转矩控制信号分别发送给该第一交流驱动装置和该第二交流驱动装置。

如上所述的能量管理方法，其中该转矩分配单元包括转矩分配算法，该转矩分配算法根据该第一驱动装置和该第二驱动装置中的第一交流电机和第二交流电机的效率曲线图制定出查询表格，该查询表格定义了该第一交流电机和该第二交流电机运行的高效率区域。

如上所述的能量管理方法，至少包括以下步骤中的一者：在容错模式下，启用该第一交流驱动装置和该第二交流驱动装置中至少一个装置，并启用该第一存储单元和该第二存储单元至少一个单元。在启动模式下，当需求功率在该第二交流驱动装置能力范围内时启用该第二交流驱动装置。在启动模式下，当该需求功率超出该第二交流驱动装置能力范围时启用该第一交流驱动装置。在加速模式下，启用该第一交流驱动装置和该第二交流驱动装置。在巡航模式下，启用该第一交流驱动装置和该第二交流驱动装置至少一个装置。以及在制动模式下，启用该第一交流驱动装置和该第二交流驱动装置。

本发明的另一个方面在于提供一种电驱动系统，该电驱动系统包括电能存储系统，电能转换系统，交流传动系统，功率分配装置和能量管理系统。该电能存储系统至少包括一个电能存储单元，该电能存储系统用于提供或接收电能。该电能转换系统与该电能存储系统连接，该电能转换系统用于将一种输入电能转换成一种输出电能。该交流传动系统与该电能转换系统连接，该

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交流传动系统用于将该电能转换系统的输出电能转换成机械转矩，该交流传动系统包括第一交流驱动装置和第二交流驱动装置，该第一交流驱动装置和该第二交流驱动装置与该电能转换系统连接，该第一交流驱动装置用于提供或者接收第一机械转矩，该第二交流驱动装置用于提供或者接收第二机械转矩。该能量管理系统与该电能存储系统，该交流传动系统和该电能转换系统通讯，该能量管理系统用于提供控制信号。该功率分配装置连接在该交流传动系统和负载之间，该功率分配装置包括第一机械端口，第二机械端口和第三机械端口，该第一机械端口与该第一交流驱动装置连接，该第二机械端口与该第二交流驱动装置连接，该第三机械端口与该负载连接，该功率分配装置用于将该第一机械转矩分解为该第二机械转矩和该第三机械转矩，该第一机械端口用于接收来自该第一交流驱动装置提供的该第一机械转矩。该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电；该第三机械端口用于给该负载提供该第三机械转矩。

本发明提供的电驱动系统以及能量管理方法与传统的方法相比，通过该第一电能存储单元和该第二电能存储单元的结合，至少其中之一可被启用。通过该第一交流驱动装置和该第二交流驱动装置的结合，至少其中之一可被启用。根据被启用的电能存储单元和被启用的交流驱动装置以及该电能转换系统的不同结构，该能量管理系统可产生多种电能控制信号，以便灵活的控制电能在该电驱动系统中的双向流动。通过多条电能流通路径给该电能存储系统充电可减少该电驱动系统的能量损失从而可提高该电驱动系统的效率。

附图说明

通过结合附图对于本发明的实施方式进行描述，可以更好地理解本发明，在附图中：

图 1 所示为应用于动力系统中用来驱动两个负载的电驱动系统的一种实施方式的模块示意图；

图 2 所示为应用于动力系统中用来驱动一个负载的电驱动系统的一种实施方式的模块示意图；

图 3 所示为图 1 所示的应用于电动汽车系统中的电驱动系统的一种实施方式的模块示意图；

图 4 所示为图 1 所示的应用于电动汽车系统中的电驱动系统的另一种实

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施方式的模块示意图；

图 5 所示为图 1 所示的应用于电动汽车系统中的电驱动系统的另一种实施方式的模块示意图；

图 6 所示为能量管理方法的一种实施方式的流程图；

图 7 所示为图 6 所示决定是否使第一交流电机和第二交流电机均被启用步骤的一种实施方式的流程图；

图 8 所示为图 6 所示通过转矩分配单元计算两个转矩控制信号步骤的一种实施方式的流程图；

图 9 所示为应用于图 8 所示流程图中的交流传动系统的转矩-转速曲线；以及

图 10 所示为图 6 所示启用第一电能存储单元和第二电能存储单元至少一个单元步骤的一种实施方式的流程图。

具体实施方式

以下将描述本发明的一个或者多个具体实施方式。首先要指出的是，在这些实施方式的具体描述过程中，为了进行简明扼要的描述，本说明书不可能对实际的实施方式的所有特征均作详尽的描述。应当可以理解的是，在任意一种实施方式的实际实施过程中，正如在任意一个工程项目或者设计项目的过程中，为了实现开发者的具体目标，或者为了满足系统相关的或者商业相关的限制，常常会做出各种各样的具体决策，而这也会从一种实施方式到另一种实施方式之间发生改变。此外，还可以理解的是，虽然这种开发过程中所作出的努力可能是复杂并且冗长的，然而对于与本发明公开的内容相关的本领域的普通技术人员而言，在本公开揭露的技术内容的基础上进行的一些设计，制造或者生产等变更只是常规的技术手段，不应当理解为本发明公开的内容不充分。

除非另作定义，在本说明书和权利要求书中使用的技术术语或者科学术语应当为本发明所属技术领域内具有一般技能的人士所理解的通常意义。本说明书以及权利要求书中使用的“第一”或者“第二”以及类似的词语并不表示任何顺序、数量或者重要性，而只是用来区分不同的组成部分。“一个”或者“一”等类似词语并不表示数量限制，而是表示存在至少一个。“或者”包括所列举的项目中的任意一者或者全部。“包括”或者“包含”等类似的词语意指出现在“包括”或者“包含”前面的元件或者物件涵盖出现在“包括”或者“包含”后面列

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举的元件或者物件及其等同元件，并不排除其他元件或者物件。“连接”或者“相连”等类似的词语并非限定于物理的或者机械的连接，而是可以包括电性的连接，不管是直接的还是间接的。此外，“电路”或者“电路系统”以及“控制器”等可以包括单一组件或者由多个主动元件或者被动元件直接或者间接相连的集合，例如一个或者多个集成电路芯片，以提供所对应描述的功能。

本发明中使用的“可”、“可以”与“可能”等词语表明在某些环境中事件发生的可能性；拥有一种特定属性、特征或功能；和/或通过与某一合格动词结合表示一个或多个能力、性能或可能性。相应地，“可能”的使用表明：被修饰的术语对于所示的能力、功能或用途是明显适当、可匹配或合适的；同时考虑到在某些情况的存在，被修饰的术语有时可能不适当，不匹配或不合适。例如，在某些情况下，可能预期出现某一结果或性能；而在其他情况下，该结果或性能可能不出现。这一区别由表示“可能”的词语体现。

图 1 所示为本发明揭示的应用于动力系统中用来驱动两个负载的电驱动系统 10 的一种实施方式的概略模块示意图。该动力系统可以包括叉车系统和起重机系统。该电驱动系统 10 大致包括电能存储系统 11，电能转换系统 13，交流传动系统 15 和能量管理系统 17。在一些实施方式中，该电能转换系统 13 用于将该电能存储系统 11 产生的一种直流电能转换成另一种直流电能，该另一种直流电能被提供给该交流传动系统 15。在一些实施方式中，该电能转换系统 13 用于将该交流传动系统 15 产生的一种直流电能转换成另一种直流电能，该另一种直流电能用于给该电能存储系统 11 充电。

该能量管理系统 17 与该电能存储系统 11，该电能转换系统 13 以及该交流传动系统 15 进行通讯。在一些实施方式中，该能量管理系统 17 可用于发送电能控制信号 171，该电能控制信号 171 用于启用该电能转换系统 13，以给该交流传动系统 15 提供必要的直流电能。在一些实施方式中，该能量管理系统 17 可以用于发送电能控制信号 171，该电能控制信号 171 用于启用该电能转换系统 13，以提供必要的直流电能为该电能存储系统 11 充电。在一些实施方式中，该能量管理系统 17 可给该交流传动系统 15 发送转矩控制信号 173，该转矩控制信号 173 用于启用该交流传动系统 15，以给负载系统 31 提供必要的机械转矩。该转矩控制信号 173 至少依据输入的电驱动系统的速度 25 来产生。

在一些实施方式中，该电能存储系统 11 包括第一电能存储单元 12 和第

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二电能存储单元 14。该第一电能存储单元 12 用于提供或者接收第一电能，该第二电能存储单元 14 用于提供或者接收第二电能。在一些实施方式中，该电能存储系统 11 可包括多于两个电能存储单元。在一些实施方式中，该交流传动系统 15 包括第一交流驱动装置 20 和第二交流驱动装置 22，该第一交流驱动装置 20 用于提供或者接收第一机械转矩，该第二交流驱动装置 22 用于提供或者接收第二机械转矩。在一些实施方式中，该交流传动系统 15 可包括多于两个交流驱动装置。

该电能转换系统 13 包括电能转换装置 18。该电能转换装置 18 包括第一端口 24，第二端口 26，第三端口 28 和第四端口 30。该第一端口 24 与该第一电能存储单元 12 连接，该第二端口 26 与该第二电能存储单元 14 连接，该第三端口 28 与该第一交流驱动装置 20 连接，该第四端口 30 与该第二交流驱动装置 22 连接。在一些实施方式中，该电能转换装置 18 可包括多于四个端口。

在一些实施方式中，当该电驱动系统 10 运行在电驱动模式下时，该第一端口 24 用于接收来自该第一电能存储单元 12 产生的第一输入电能，该第二端口 26 用于接收来自该第二电能存储单元 14 产生的第二输入电能。在一些实施方式中，接收到的该第一输入电能和该第二输入电能通过该电能转换装置 18 被转换为第一输出电能和第二输出电能，该第一输出电能可以通过该第三端口 28 被提供给该第一交流驱动装置 20，该第二输出电能可以通过该第四端口 30 被提供给该第二交流驱动装置 22。

在一些实施方式中，当该电驱动系统 10 运行在制动模式或者刹车模式下，该第三端口 28 用于接收来自该第一交流驱动装置 20 产生的第一输入电能，该第四端口 30 用于接收来自该第二交流驱动装置 22 产生的第二输入电能。在一些实施方式中，接收到的该第一输入电能和该第二输入电能通过该电能转换装置 18 被转换为第一输出电能和第二输出电能，该第一输出电能可以通过该第一端口 24 和/或该第二端口 26 给该电能存储系统 11（例如第一电能存储单元 12）充电，该第二输出电能可以通过该第一端口 24 和/或该第二端口 26 给该电能存储系统 11（例如第二电能存储单元 14）充电。

在一些实施方式中，该电能转换系统 13 可包括预充电开关装置 16，该预充电开关装置 16 连接在该第一电能存储单元 12 和该第二电能存储单元 14 之间，该预充电开关装置 16 用于在该第一电能存储单元 12 和该第二电能存

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储单元 14 之间提供电能流通路径。在一些实施方式中，该电能流通路径可以是单向的，例如，该第一电能存储单元 12 可通过该单向电能流通路径为该第二电能存储单元 14 充电。在一些实施方式中，该电能流通路径也可以是双向的，例如，电能可通过该双向电能流通路径在该第一电能存储单元 12 和该第二电能存储单元 14 之间进行传输。

该负载系统 31 包括第一负载 27 和第二负载 29，该第一负载 27 与该第一交流驱动装置 20 连接，该第二负载 29 与该第二交流驱动装置 22 连接。在一些实施方式中，该第一负载 27 和该第二负载 29 可以分别用于接收来自该第一交流驱动装置 20 的第一机械转矩和来自该第二交流驱动装置 22 的第二机械转矩。在一些实施方式中，当该动力系统运行在制动模式或者刹车模式下时，该第一负载 27 和该第二负载 29 可以用于分别提供第一机械转矩，第二机械转矩给该第一交流驱动装置 20 和该第二交流驱动装置 22。然后该第一机械转矩和该第二机械转矩分别被该第一交流驱动装置 20 和该第二交流驱动装置 22 转换成电能，以给该电能存储系统 11 充电。

通过至少两个电能存储单元的结合，至少可以产生一种电能提供或者接收动作。通过合适的方式可以提高电能利用率并延长该电能存储系统的寿命。通过至少两个交流驱动装置的结合，至少可以产生一种电能转换动作。通过灵活的方式可以提高该电驱动系统的效率。

图 2 所示为本发明揭示的应用于动力系统中来驱动一个负载 23 的电驱动系统 50 的一种实施方式的概略模块示意图。该动力系统可以包括电动汽车系统和电梯系统。该电驱动系统 50 与图 1 所示的电驱动系统 10 相似，该电驱动系统 50 包括该电能存储系统 11，该电能转换系统 13，该交流传动系统 15 和该能量管理系统 17。因此，这里对于该电能存储系统 11，该电能转换系统 13，该交流传动系统 15 和该能量管理系统 17 的相同部分省略不表。

在一些实施方式中，该电驱动系统 50 包括功率分配装置 19，该功率分配装置 19 连接在该交流传动系统 15 和该负载 23 之间。

该功率分配装置 19 包括第一机械端口 32，第二机械端口 34 和第三机械端口 36。该第一机械端口 32 与该第一交流驱动装置 20 连接，该第一机械端口 32 用于接收或提供第一机械转矩；该第二机械端口 34 与该第二交流驱动装置 22 连接，该第二机械端口 34 用于接收或提供第二机械转矩；该第三机械端口 36 与负载 23 连接，该第三机械端口 36 用于提供或接收第三机械转矩。

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在一些实施方式中，该功率分配装置 19 包括一个或多个齿轮 35，该功率分配装置 19 用于将该交流传动系统 15 产生的机械转矩通过该多个齿轮 35 的传动作用提供给该负载 23。

在一些实施方式中，当该动力系统用于驱动重负载时，该第一机械端口 32 接收来自该第一交流驱动装置 20 产生的第一机械转矩，该第二机械端口 34 接收来自该第二交流驱动装置 22 产生的第二机械转矩，该第三机械端口 36 用于给该负载 23 提供第三机械转矩，该功率分配装置 19 用于将该第一机械转矩和该第二机械转矩进行结合，并输出由该第一机械转矩和该第二机械转矩结合得到的该第三机械转矩。

在一些实施方式中，当该动力系统运行于制动模式或刹车模式时，该功率分配装置 19 用于将第三机械转矩分解为第一机械转矩和第二机械转矩，该第三机械端口 36 用于接收来自该负载 23 提供的该第三机械转矩；该第一机械端口 32 用于给该第一交流驱动装置 20 提供该第一机械转矩，该第二机械端口 34 用于给该第二交流驱动装置 22 提供该第二机械转矩。该交流传动系统 15 将该第一机械转矩，该第二机械转矩转换为电功率以给该电能存储系统 11 充电。

在一些实施方式中，当该动力系统用于驱动轻负载时，该第一机械端口 32 用于接收来自该第一交流驱动装置 20 产生的第一机械转矩，该第二机械端口 34 用于给该第二交流驱动装置 22 提供第二机械转矩，该第三机械端口 36 用于给该负载 23 提供第三机械转矩，该功率分配装置 19 用于将该第一机械转矩分解为该第二机械转矩和该第三机械转矩。该第二交流驱动装置 22 将该第二机械转矩转换为电功率，以给该电能存储系统 11 充电。

在一些实施方式中，该电驱动系统 50 可包括一个可选的变速装置 21。该变速装置 21 连接在该交流驱动系统 15 和该功率分配装置 19 之间，该变速装置 21 用于将该交流传动系统 15 输出的速度与电驱动系统的速度进行匹配。

在一些实施方式中，该变速装置 21 可以连接在该第一交流驱动装置 20 和该功率分配装置 19 的第一机械端口 32 之间。在一些实施方式中，该变速装置 21 可以连接在该第二交流驱动装置 22 和该功率分配装置 19 的第二机械端口 34 之间。在一些实施方式中，当该交流传动系统 15 输出的速度可以满足该电驱动系统的速度要求时，该变速装置 21 可省略。

通过选择合适的电能存储单元，合适的交流驱动装置以及在电能存储单

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元和交流驱动装置之间合适的连接方式可以减小电驱动系统的重量、体积和成本。

在一些实施方式中，该电能存储系统 11 可能包括两个蓄电池，该两个蓄电池分别用作该第一电能存储单元 12 和该第二电能存储单元 14。在一些实施方式中，该电能存储系统 11 可能包括蓄电池和超级电容器，该蓄电池和超级电容器分别用作该第一电能存储单元 12 和该第二电能存储单元 14。在一些实施方式中，该电能存储系统 11 可能包括其他种类的电池，例如飞轮储能电池。

在一些实施方式中，该交流传动系统 15 可能包括两个感应电机，该两个感应电机分别用作该第一交流驱动装置 20 和该第二交流驱动装置 22。在一些实施方式中，该交流传动系统 15 可能包括感应电机和永磁电机，该感应电机和该永磁电机分别用作该第一交流驱动装置 20 和该第二交流驱动装置 22。在一些实施方式中，该交流传动系统 15 可能包括其他种类的电机，例如开关磁阻电机。

图 3 所示为本发明揭示的应用于电动汽车系统中的电驱动系统 100 的一种实施方式的概略模块示意图。该电驱动系统 100 大致包括电能存储系统 102，电能转换系统 104，交流传动系统 106，能量管理系统 208，功率分配装置 122 和变速装置 119。

在一些实施方式中，该电能存储系统 102 包括蓄电池 101 和超级电容器 103。该交流传动系统 106 包括第一交流驱动装置 116 和第二交流驱动装置 118。该第一交流驱动装置 116 包括第一直流/交流逆变器 111 和感应电机 115。该第二交流驱动装置 118 包括第二直流/交流逆变器 113 和永磁电机 117。在一些实施方式中，单独的电能转换装置 107 用作如图 1 所详细描述的该电能转换装置 18。

电驱动系统 100 可包括多条电能流通路径。在一些实施方式中，启用该蓄电池 101 并通过该电能转换系统 104 来转换电能，该电能转换系统 104 将转换的电能提供给该感应电机 115 和该永磁电机 117 中至少一个电机，以此至少形成第一电能流通路径。在一些实施方式中，启用该超级电容器 103 并通过该电能转换系统 104 来转换电能，该电能转换系统 104 将转换的电能提供给该感应电机 115 和该永磁电机 117 中至少一个电机，以此至少形成第二电能流通路径。

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在一些实施方式中，由该感应电机 115 和该永磁电机 117 中至少一个电机产生的机械转矩首先被转换为电能，然后该电能可以通过该电能转换系统 104 用于给该蓄电池 101 和该超级电容器 103 中至少一个进行充电，以此至少形成第三电能流通路径。在一些实施方式中，该蓄电池 101 产生的电能可以通过预充电开关装置 105 给该超级电容器 103 充电，以此至少形成第四电能流通路径。

一种灵活的充电策略可用于给该蓄电池 101 和该超级电容器 103 中至少一个进行充电。例如，在一些实施方式中，该感应电机 115 产生的电能可通过该单独的电能转换装置 107 给该超级电容器 103 充电。这种实施方式不同于之前利用该预充电开关装置 105 给该超级电容器 103 充电的方式。在一些实施方式中，该能量管理系统 108 可以用于实施一种解耦算法来实现对该感应电机 115 和该永磁电机 117 的独立控制。

图 4 所示为本发明揭示的应用于电动汽车系统中的电驱动系统 200 的一种实施方式的概略模块示意图。在该电驱动系统 200 中，电能转换系统 204 包括第一电能转换装置 207 与第二电能转换装置 209，该第一电能转换装置 207 与该第二电能转换装置 209 并联连接。在一些实施方式中，该功率分配装置 121 可包括一个或多个行星齿轮组 37，该功率分配装置 121 用于将该交流传动系统 106 产生的机械转矩通过该一个或者多个行星齿轮组 37 的传动作用提供给负载 123。

在一些实施方式中，该第一电能转换装置 207 包括第一端口 231 和第三端口 235。该第二电转换装置 209 包括第二端口 233 和第四端口 237。在其他实施方式中，该第一电能转换装置 207 提供的端口也可以多于两个，该第二电转换装置 209 提供的端口也可以多于两个。

在一些实施方式中，该感应电机 115 产生的电能可直接通过该电能转换系统 204 和该预充电开关装置 105 给该超级电容器 103 充电。同时，该永磁电机 117 产生的电能可直接通过该电能转换系统 204 给该超级电容器 103 充电。

对该第一电能转换装置 207 和该第二电能转换装置 209 的独立控制可在该第三端口 235 和该第四端口 237 得到不同的直流电压，因此可以实现对该感应电机 115 和该永磁电机 117 的解耦控制。

该电驱动系统 200 中包括多条用于给该超级电容器 103 充电的电能流通

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路径。在一些实施方式中，该蓄电池 101 可以通过该预充电开关装置 105 给该超级电容器 103 充电。在一些实施方式中，该感应电机 115 可通过该第一电能转换装置 207 和该预充电开关装置 105 给该超级电容器 103 充电。在一些实施方式中，该永磁电机 117 可通过该第二电能转换装置 209 给该超级电容器 103 充电。在一些实施方式中，至少该感应电机 115 产生的部分机械转矩可以通过该永磁电机 117 被转换为电功率，该电功率再通过该第二电转换装置 209 给该超级电容器 103 充电。

图 5 所示为本发明揭示的应用于电动汽车系统中的电驱动系统 300 的一种实施方式的概略模块示意图。在该电驱动系统 300 中，电能转换系统 304 包括第一电能转换装置 307 与第二电能转换装置 309，该第一电能转换装置 307 与该第二电能转换装置 309 并联连接。

该第一电能转换装置 307 包括第一端口 331，第二端口 333，第三端口 335。在一些实施方式中，该第三端口 335 与该第二交流驱动装置 118 和该第二电能转换装置 309 连接。该第二电能转换装置 309 包括输入端口 337 和输出端口 339，该输入端口 337 与该第一电能转换装置 307 的第三端口 335 连接，该输出端口 339 与该第一交流驱动装置 116 连接。在一些实施方式中，类似于如图 3 所示对该电驱动系统 10 所作的描述，该电驱动系统 300 中可灵活的包括多条电能流通路径。

对该第一电转换装置 307 和该第二电能转换装置 309 的独立控制可在该第三端口 335 和该输出端口 339 得到不同的直流电压，因此可以实现对该感应电机 115 和该永磁电机 117 的解耦控制。

在一些实施方式中，该第二电能转换装置 309 与该第二交流驱动装置 118 连接。在一些实施方式中，该电能转换系统 304 可以包括更多电能转换装置和灵活的连接方式。

图 6 所示为能量管理方法的一种实施方式的流程图。该能量管理方法 600 可以编程为程序指令或者计算机软件，并保存在可以被电脑或者处理器读取的存储介质上。当该程序指令被电脑或者处理器执行时，可以实现如流程图所示的各个步骤。可以理解，电脑可读的介质可以包括易失性的和非易失性的，以任何方法或者技术实现的可移动的以及非可移动的介质。更具体言之，电脑可读的介质包括但不限于随机访问存储器，只读存储器，电可擦只读存储器，闪存存储器，或者其他技术的存储器，光盘只读存储器，数字化光盘

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存储器，或者其他形式的光学存储器，磁带盒，磁带，磁碟，或者其他形式的磁性存储器，以及任何其他形式的可以用于存储能被指令执行系统访问的预定信息的存储介质。

在一些实施方式中，该能量管理方法 600 可以从步骤 601 开始执行。在步骤 601 中，接收测量到的电驱动系统的速度信号V_{speed}。然后流程转向步骤 603，在步骤 603 中，在一些实施方式中，需求功率信号P_{req}可通过总转矩需求信号T_{total}和电驱动系统的速度信号V_{speed}计算得到。然后流程转向步骤 605。

在步骤 605 中，该能量管理方法 600 执行判断步骤，根据动力系统工作模式来确定是否该第一交流驱动装置 20 和该第二交流驱动装置 22 都被启用，该系统工作模式至少根据该电驱动系统的速度信号V_{speed}来确定。在一些实施方式中，动力系统可以工作在正常模式，该正常模式包括启动模式，加速模式，巡航模式，制动模式。在一些实施方式中，该动力系统可以工作在容错模式，该容错模式可通过测量到的电压或者电流信号来判断。

在一些实施方式中，被启用的交流驱动装置和该被启用交流驱动装置中的交流电机的工作方式可根据该工作模式或者该需求功率信号P_{req}来决定，该交流电机的工作方式可包括发电机和电动机。如果该第一交流驱动装置 20 和该第二交流驱动装置 22 都被启用，该能量管理方法 600 转向步骤 607 执行，否则，该能量管理方法 600 转向步骤 609。

在步骤 607 中，优化算法可在转矩分配单元中实施，该转矩分配单元用于将该总转矩需求信号T_{total}分配为第一转矩控制信号和第二转矩控制信号。该第一转矩控制信号被提供给该第一交流驱动装置 20，该第二转矩控制信号被提供给该第二交流驱动装置 22。然后流程转向步骤 609。

在步骤 609 中，根据该被启用的交流驱动装置和该电能转换系统 13 的结构，启用该第一电能存储单元 12 和该第二电能存储单元 14 至少一个单元。在一些实施方式中，被启用电能存储单元的工作方式可根据该需求功率信号P_{req}来决定，该被启用电能存储单元的工作方式可包括充电和放电。

在一些实施方式中，决定该被启用电能存储单元的原则是该第一电能存储单元 12 用作主要电源，该第二电能存储单元 14 用作辅助电源。在一些实施方式中，该第一电能存储单元 12 用于给该第一交流驱动装置 20 提供电能，该第二电能存储单元 14 用于给该第二交流驱动装置 22 提供电能。

在一些实施方式中，由于受到充/放电特性限制，当该第一电能存储单元

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12 不足以快速地提供该需求功率信号P_{req}时，由该第二电能存储单元 14 提供额外所需功率。在一些实施方式中，当该第二电能存储单元 14 不足以提供该额外所需功率时，仍旧由该第一电能存储单元 12 供所需功率。

在一些实施方式中，当该动力系统工作在制动模式或刹车模式时，该第一交流驱动装置 20 和该第二交流驱动装置 22 提供的部分电能可用于给第二电能存储单元 14 充电。然后流程转向步骤 611。

在步骤 611 中，根据该启用的交流驱动装置和该启用的电能存储单元及其工作方式决定电能控制信号 171。该电能控制信号 171 可通过如下所述过程得到。

该电能存储系统 11 产生的电能被提供给该交流传动系统 15。在一些实施方式中，该第一端口 24 接收的第一输入功率可以被转换为第一输出功率和第二输出功率，该第一输出功率和该第二输出功率分别通过该第三端口 28 和该第四端口 30 输出。在一些实施方式中，该第二端口 26 接收的第二输入功率可以被转换为第一输出功率和第二输出功率，该第一输出功率和该第二输出功率分别通过该第三端口 28 和该第四端口 30 输出。然后，根据该被启用交流驱动装置，该第三端口 28 和该第四端口 30 接收的电能被选择性地提供给该交流传动系统 15。

该交流传动系统 15 产生的电能用于给该电能存储系统 11 充电。在一些实施方式中，当该第一交流驱动装置 20 中的第一交流电机用作发电机时，该第一交流驱动装置 20 产生的电能可用于给该电能存储系统 11 充电。在该充电过程中，该电能可以直接通过该电能转换装置 18 或者间接再通过该预充电开关装置 16 给该第二电能存储单元 14 充电。

在一些实施方式中，当该第二交流驱动装置 22 中的第二交流电机用作发电机时，该第二交流驱动装置 22 产生的电能可用于给该电能存储系统 11 充电。在该充电过程中，该电能可以直接通过该电能转换装置 18 给该电能存储系统 11 充电。

在一些实施方式中，当该第一交流驱动装置 20 中的第一交流电机用作电动机，该第二交流驱动装置 22 中的第二交流电机用作发电机时，该第一交流驱动装置 20 产生的机械转矩可通过该功率分配装置 19 被分解为第一机械转矩和第二机械转矩。该第一机械转矩被提供给负载 23，该第二机械转矩通过该第二交流驱动装置 22 被转换为电能，该电能通过该电能转换装置 18 给第

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二电能存储单元 14 充电。

在一些实施方式中，该第一电能存储单元 12 产生的功率可以通过该预充电开关装置 16 给该第二电能存储单元 14 充电。通过以上能量流动过程分析可得到电能控制信号 171。然后流程转向步骤 613。

在步骤 613 中，该电能控制信号 171 将被提供给电能转换系统 13，该电能控制信号 171 用于控制电能在该电能存储系统 11，该电能转换系统 13 和该交流传动系统 15 中的流动。然后流程转向步骤 615。

在步骤 615 中，转矩控制信号 173 用于控制该交流传动系统 15 输出期望转矩，该期望转矩用于驱动该负载 23。

如上所述的方法 600 可包括多种改进方式。在一些实施方式中，在步骤 601 之前可包括额外步骤，在该额外步骤中，根据第二电能存储单元 14 的电流、电压或决定是否需要进行预充电过程。在一些实施方式中，当第二电能存储单元的功率信号小于预先设定的阈值时，该预充电过程被启用，否则，该预充电过程不被启用。

在一些实施方式中，该预充电过程在该动力系统被使能之前进行初始化。该预充电过程包括将该第一电能存储单元 12 的电能通过该预充电开关装置 16 给该第二电能存储单元 14 充电。以便保证当有需要时，该第二电能存储单元 14 可快速地提供充足的能量。然后流程转向步骤 601。

图 7 所示为图 6 中决定是否该第一交流驱动装置 20 和该第二交流驱动装置 22 均被启用的步骤的具体方法流程图，该方法 700 在本发明中应用于电动汽车系统中。该方法 700 的具体细节描述是结合如图 3 所示的电驱动系统。然而本领域的技术人员可将该方法 700 应用于其他动力系统中。

在一些实施方式中，该方法 700 可以从步骤 701 开始，如果该电动汽车系统不能正常运行，至少测量到的电流或者电压信号超出正常值，则该电动汽车系统工作在如步骤 705 所显示的容错模式。否则，该电动汽车系统工作在如步骤 703 所显示的正常模式。

当该电动汽车系统工作在容错模式时，至少该蓄电池 101，该超级电容器 103，该感应电机 115 和该永磁电机 117 当中一个出现问题。其余正常的部分可以被重构形成精简的电驱动系统结构。

在一些实施方式中，该蓄电池 101 和该超级电容器 103 当中一个，该感应电机 115，和该永磁电机 117 被重构。在一些实施方式中，该蓄电池 101，

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该超级电容器 103，和该感应电机 115 和该永磁电机 117 当中一个被重构。在一些实施方式中，该蓄电池 101 和该超级电容器 103 当中一个，和该感应电机 115 和该永磁电机 117 当中一个被重构。通过这种重构方式，在该容错模式下，该电动汽车系统可以安全的停车。该方法可调高该电动汽车系统的容错能力和可靠性。

当该电动汽车系统工作在正常模式时，在步骤 707 中，接收汽车速度信号V_{speed}。在步骤 709 中，通过V_{speed}和T_{total}来计算P_{req}。然后流程选择性地转向四条支路 702，704，706 和 708。该四条支路决定被启用的交流电机和该被启用交流电机的工作方式。其中，属性值{1}用于表示该感应电机 115 被启用，属性值{2}用于表示该永磁电机 117 被启用，属性值{1，2}用于表示该感应电机 115 和该永磁电机 117 被启用。

在该支路 702 中，当V_{speed}从 0 开始增加时，该电动汽车系统工作在如步骤 711 所示的启动模式。该流程转向步骤 719，在步骤 719 中，决定该永磁电机 117 是否能够提供P_{req}，如果能，该流程转向步骤 723，在该步骤 723 中，该永磁电机 117 被启用作为电动机，该永磁电机 117 用于提供必要的机械转矩来达到P_{req}的要求。如果不能，该流程转向步骤 725，在该步骤 725 中，该感应电机 115 被启用作为电动机，该感应电机 115 用于提供必要的机械转矩来达到P_{req}的要求。

在该支路 704 中，当V_{speed}在一段时间内保持突升时，该电动汽车系统工作在如步骤 713 所示的加速模式。该流程转向步骤 727，在步骤 727 中，该感应电机 115 和该永磁电机 117 被启用作为电动机，该感应电机 115 和该永磁电机 117 用于提供必要的机械转矩来达到P_{req}的要求。

在该支路 706 中，当V_{speed}在一段时间内在保持小范围波动时，该电动汽车系统工作在如步骤 715 所示的巡航模式。该流程转向步骤 729，在步骤 729 中，至少该感应电机 115 和该永磁电机 117 当中一个被启用作为电动机，至少该感应电机 115 和该永磁电机 117 当中一个用于提供必要的机械转矩来达到P_{req}的要求。

在该支路 708 中，当V_{speed}在一段时间内保持突降时，该电动汽车系统工作在如步骤 717 所示制动模式。该流程转向步骤 731，在步骤 731 中，该感应电机 115 和该永磁电机 117 被启用作为发电机。

图 8 所示为图 6 中决定通过转矩分配单元计算两个转矩控制信号该步骤

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的具体方法流程图。在步骤 801 中，接收到至少该总转矩需求信号T_{total}。该流程转向步骤 803，在步骤 803 中，接收测量到的该第一交流电机和该第二交流电机的转矩信号$M_{torque1}$，$M_{torque2}$。该流程转向步骤 805，在步骤 805 中，接收测量到的该第一交流电机和该第二交流电机的转速M_{speed1}，M_{speed2}。该流程转向步骤 807。

在步骤 807 中，通过该转矩分配单元计算得到该第一转矩控制信号$T_{torque1}$和该第二转矩控制信号$T_{torque2}$。该转矩分配单元可通过该能量管理系统 17 以软件的形式实现。在一些实施方式中，T_{total}可以由至少该第一交流电机 115 和该第二交流电机 117 当中一个来提供。

在一些实施方式中，根据如图 9 所示该第一交流电机 115 和该第二交流电机 117 的转矩提供能力曲线 901、905，$T_{torque1}$和$T_{torque2}$可通过固定比例分配算法计算得到。若该第一交流电机 115 和该第二交流电机 117 其中一个不足以提供T_{total}，另外一个交流电机根据以下计算式来提供额外转矩：

$$a\,T_{torque1} = T_{total}\ (0 \le a \le 1) \quad (1),$$

$$b\,T_{torque2} = T_{total}\ (0 \le b \le 1) \quad (2),$$

$$a + b = 1 \quad (3),$$

其中a和b是两个变量，在一些实施方式中，a和b可能包括一组固定值。如当a＝1，b＝0时，该第一交流电机 115 用于独自提供T_{total}。当a＝0，b＝1时，该第二交流电机 117 用于独自提供T_{total}。在一些实施方式中，a和b可能包括多组固定值，从而可以实现优化的转矩分配方法。

在一些实施方式中，T_{total}可能被分配为平均转矩$T_{average}$和峰值转矩T_{peak}。$T_{torque1}$和$T_{torque2}$分别等于$T_{average}$和T_{peak}。例如，当动力系统突然加速时，希望该第一交流电机 115 和该第二交流电机 117 其中一个可以提供快速平稳的峰值功率。

如图 9 所示，该第一交流电机 115 能够在窄速度范围内提供一个大转矩，该第二交流电机 117 可以在宽速度范围内快速提供一个小转矩。在一些实施方式中，该第二交流电机 117 用于辅助该第一交流电机 115。具体算法如以下计算式所示：

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$$T_{total} = T_{average} + T_{peak} \quad (4),$$

$$T_{torque1} = T_{average} \quad (5),$$

$$T_{torque2} = T_{peak} \quad (6),$$

在一些实施方式中，根据如图 9 所示该第一交流电机 115 和该第二交流电机 117 的高效工作区 903、907，$T_{torque1}$和$T_{torque2}$可以通过一种算法实现该交流传动系统 106 效率的最大化，以实现该第一交流电机 115 和该第二交流电机 117 都可以工作在各自的高效工作区。在一些实施方式中，工作点的改变可通过改变该交流电机的转速来实现，该转速可通过该传输装置 21 来改变。如图 9 所示，该第一交流电机的工作点可在曲线 913 和 915 之间左右移动。

在一些实施方式中，当M_{speed1}和M_{speed2}是固定值时，该第一交流电机 115 和该第二交流电机 117 的工作点可以分别沿着曲线 909 和曲线 911 在各自的高效工作区 903、907 的范围内移动。该算法可以通过如下计算式实现:

$$T_{torque1} + T_{torque2} = T_{total} \quad (7),$$

$$P_{loss1} + P_{loss2} = min \quad (8)。$$

其中，P_{loss1}和P_{loss2}分别为该第一交流电机 115 和该第二交流电机 117 的功率损耗。该转矩分配算法根据该第一驱动装置 20 和该第二驱动装置 22 中的第一交流电机 115 和第二交流电机 117 的效率曲线图制定出一个查询表格，该查询表格定义了该第一交流电机 115 和该第二交流电机 117 运行的高效率区域。该转矩分配算法可以降低该交流传动系统 15 的损耗。

图 10 所示为图 6 中至少该第一电能存储单元 12 和该第二电能存储单元 14 当中一个被启用该步骤的具体方法流程图。其中，P_{req}表示需求功率，P_{bat}表示提供给蓄电池 101 的功率，P_{uc}表示提供给超级电容器 103 的功率，$P_{bat(threshold)}$表示该蓄电池 101 能够提供的上限功率，$P_{uc(threshold)}$表示该超级电容器 103 能够提供的上限功率，$P_{uc(charging)}$表示该超级电容器 103 所需的充电功率。

在步骤 1001 中，接收到P_{req}和该电机的属性值。然后该流程转向步骤 1003，在步骤 1003 中，执行判断操作，以决定该流程的转向。在一些实施方式中，

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当接收到属性值{1}或者属性值{1,2}时，该流程转向步骤 1005，否则，当接收到属性值{2}时，该流程转向步骤 1007。

在步骤 1005 中，如果P_{req}大于P_{bat}，该流程转向步骤 1009，否则，该流程转向步骤 1011，在步骤 1011 中，该蓄电池 101 提供电能。在步骤 1009 中，如果$P_{uc(threshold)}$大于P_{req}与$P_{bat(threshold)}$的差值，该流程转向步骤 1013，在步骤 1013 中，该蓄电池 101 提供本身能提供的上限功率，该超级电容器提供额外的功率。

在步骤 1007 中，如果P_{req}大于$P_{uc(threshold)}$，该流程转向步骤 1017，否则该流程转向步骤 1019，在步骤 1019 中，该超级电容器 103 提供功率。在步骤 1017 中，如果该超级电容器 103 需要被充电，该流程转向步骤 1021，在步骤 1021 中，该超级电容器接收到所需的充电功率$P_{uc(charging)}$，该蓄电池 101 提供需求功率P_{req}和所需的充电功率$P_{uc(charging)}$。否则，该流程转向步骤 1023，在步骤 1023 中，该超级电容器 103 提供本身能提供的上限功率，该蓄电池提供额外的功率。

虽然结合特定的实施方式对本发明进行了说明，但本领域的技术人员可以理解，对本发明可以作出许多修改和变型。因此，要认识到，权利要求书的意图在于涵盖在本发明真正构思和范围内的所有这些修改和变型。

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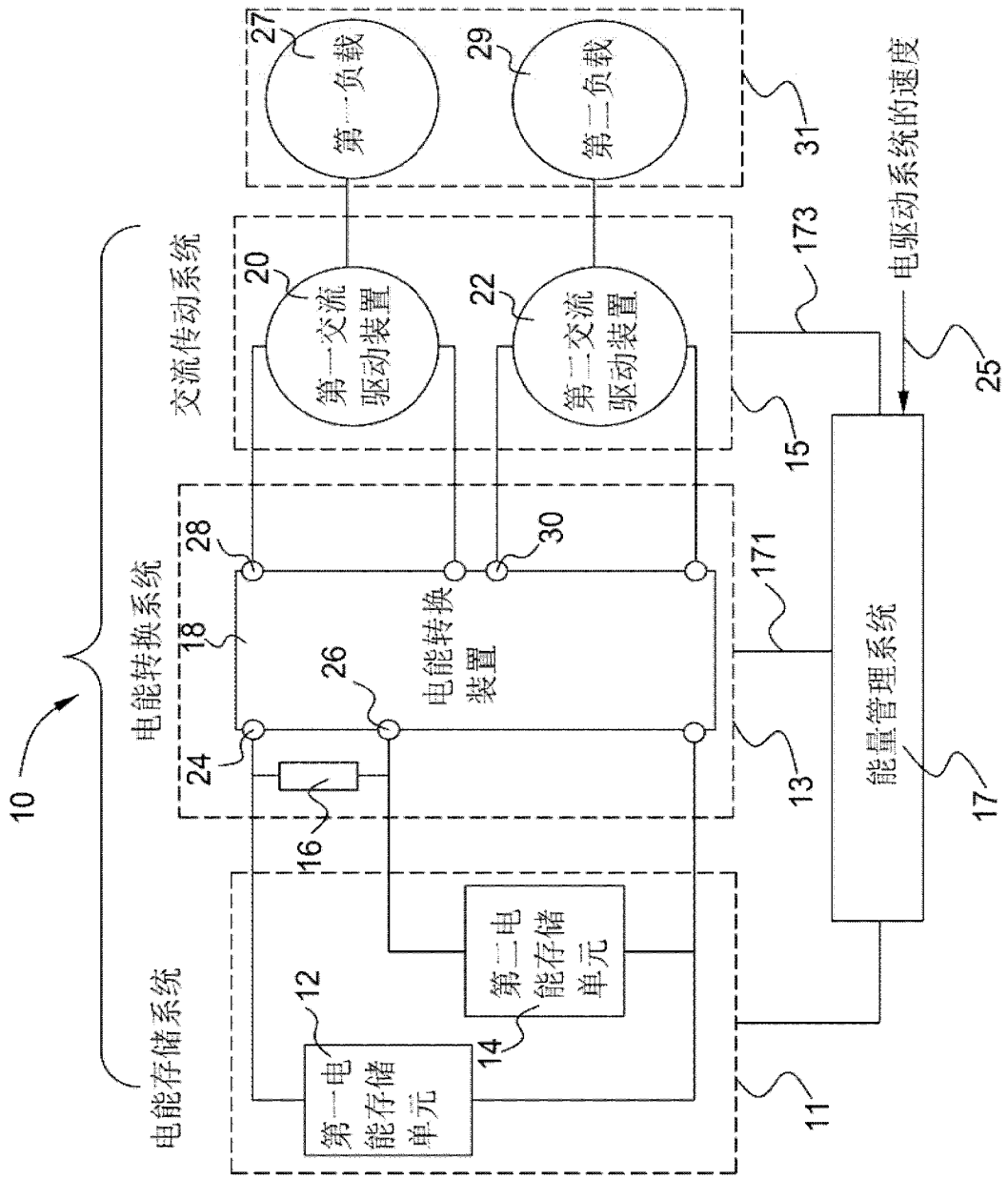


图 1

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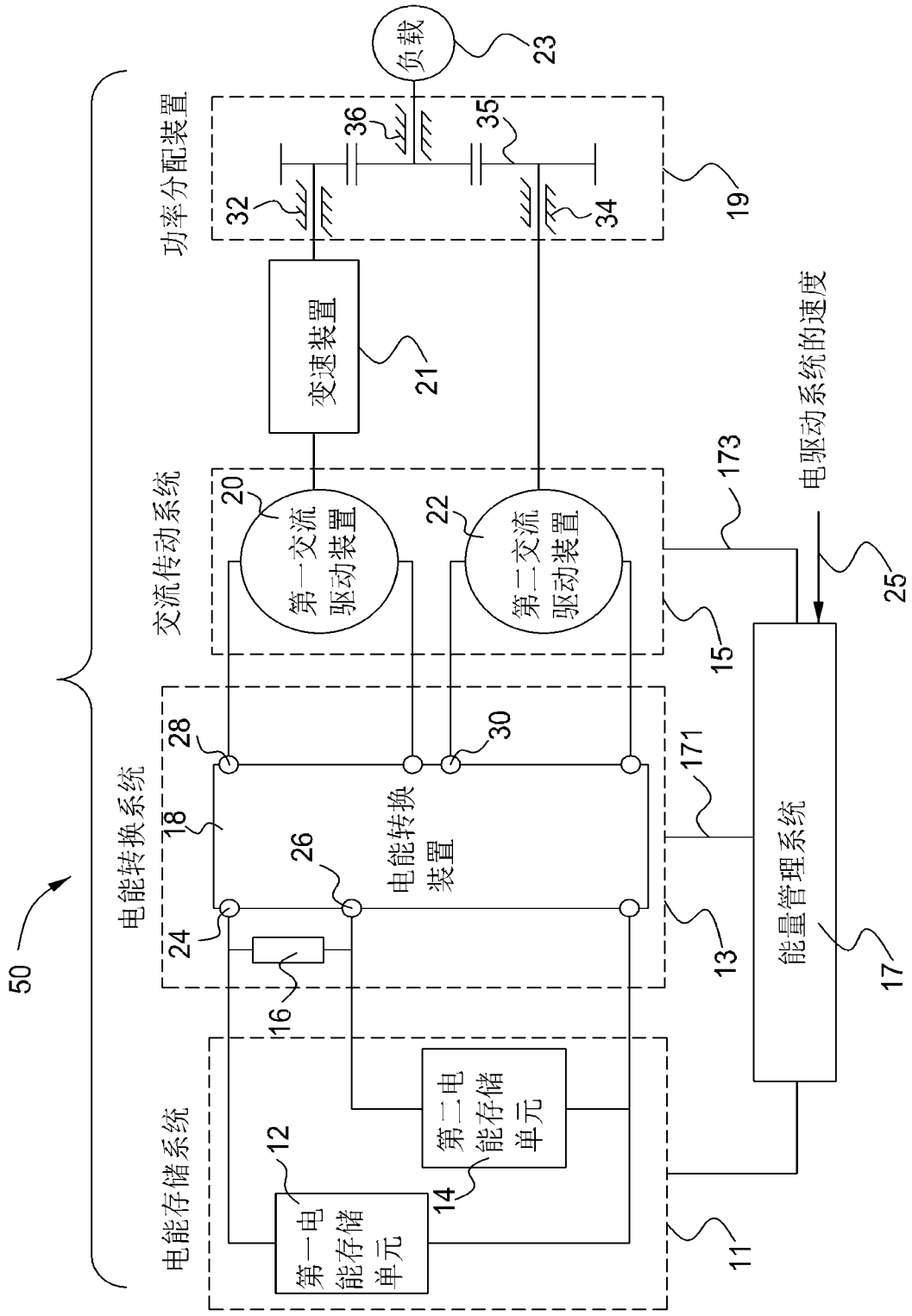


图 2

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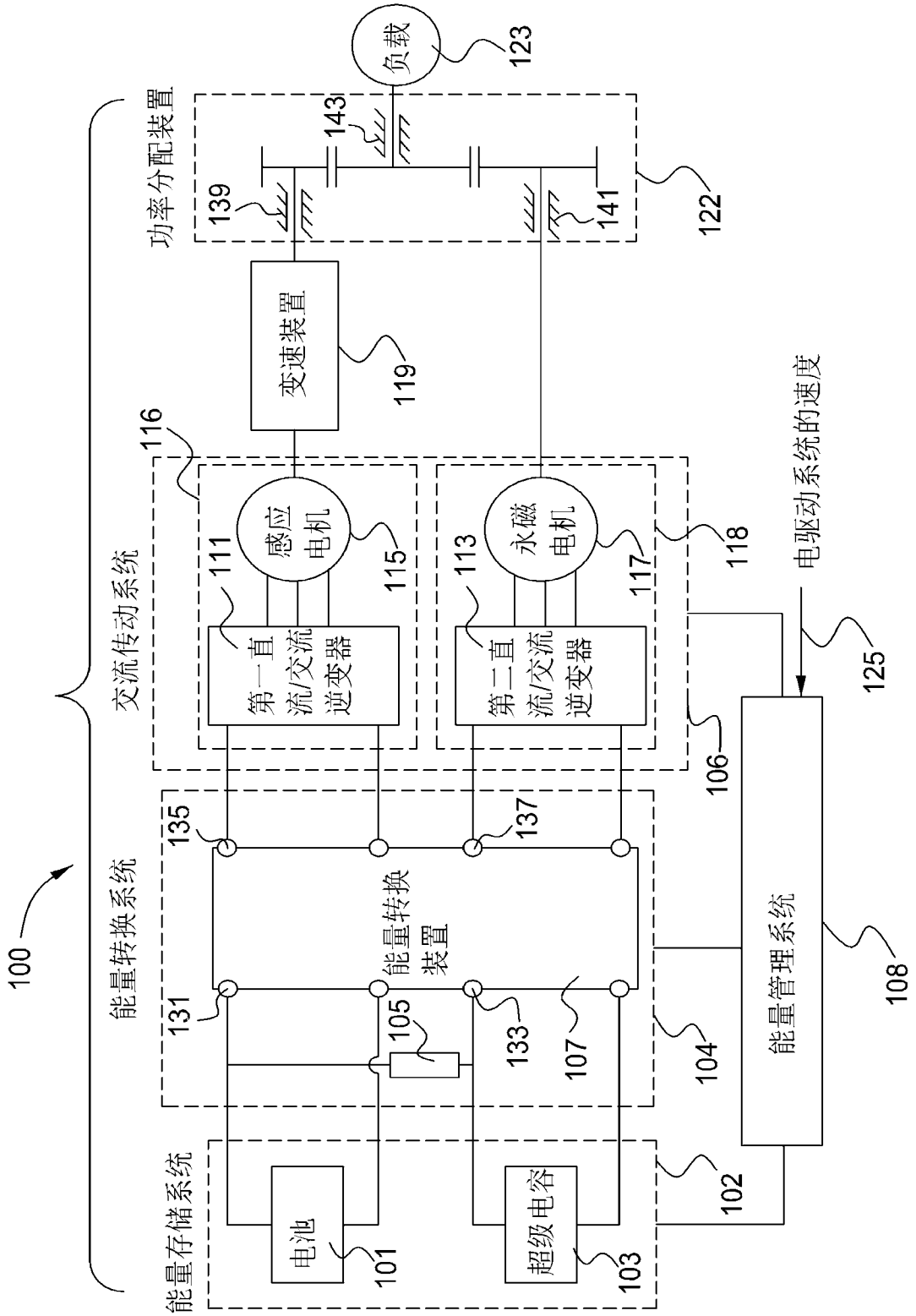


图 3

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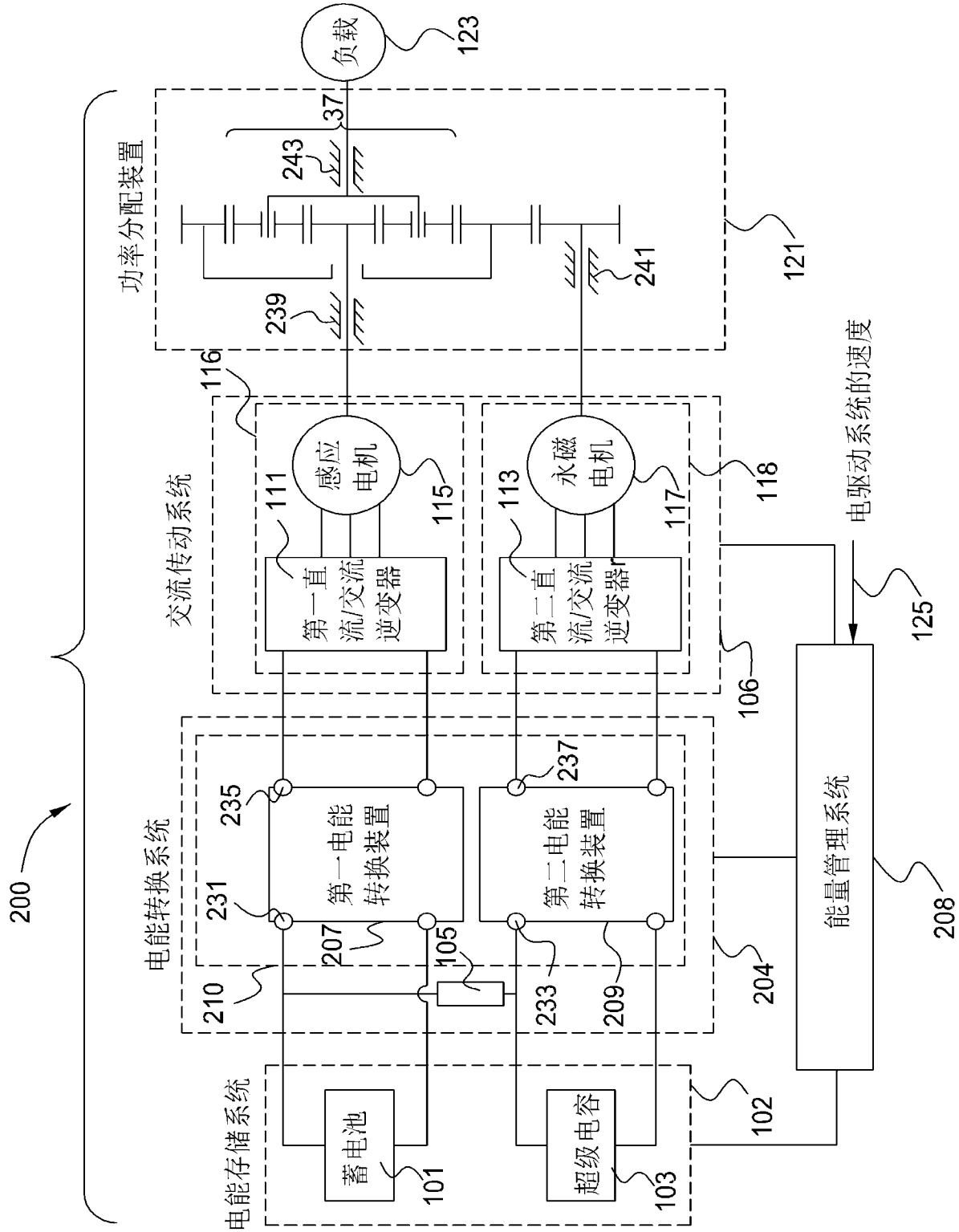


图 4

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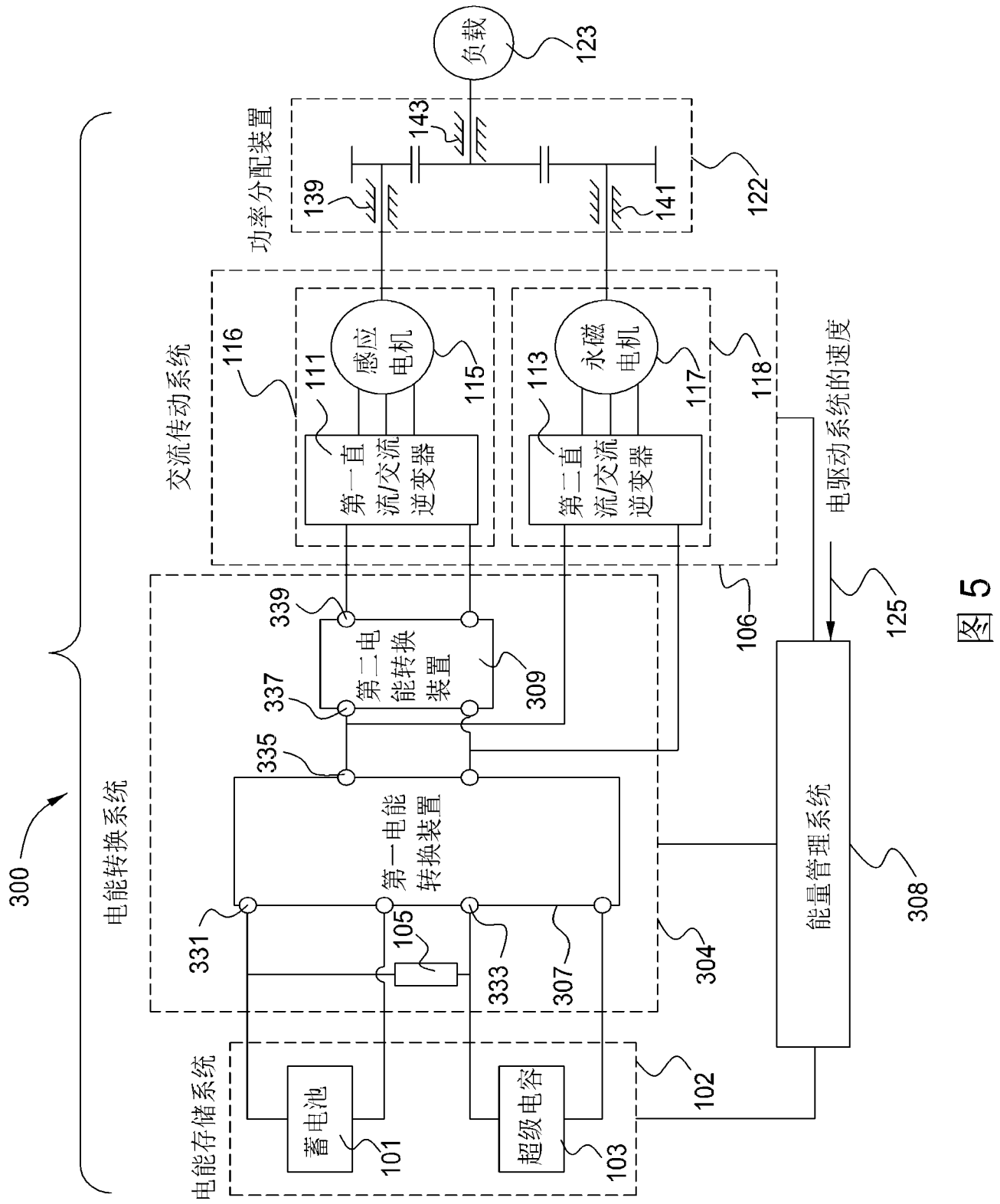


图 5

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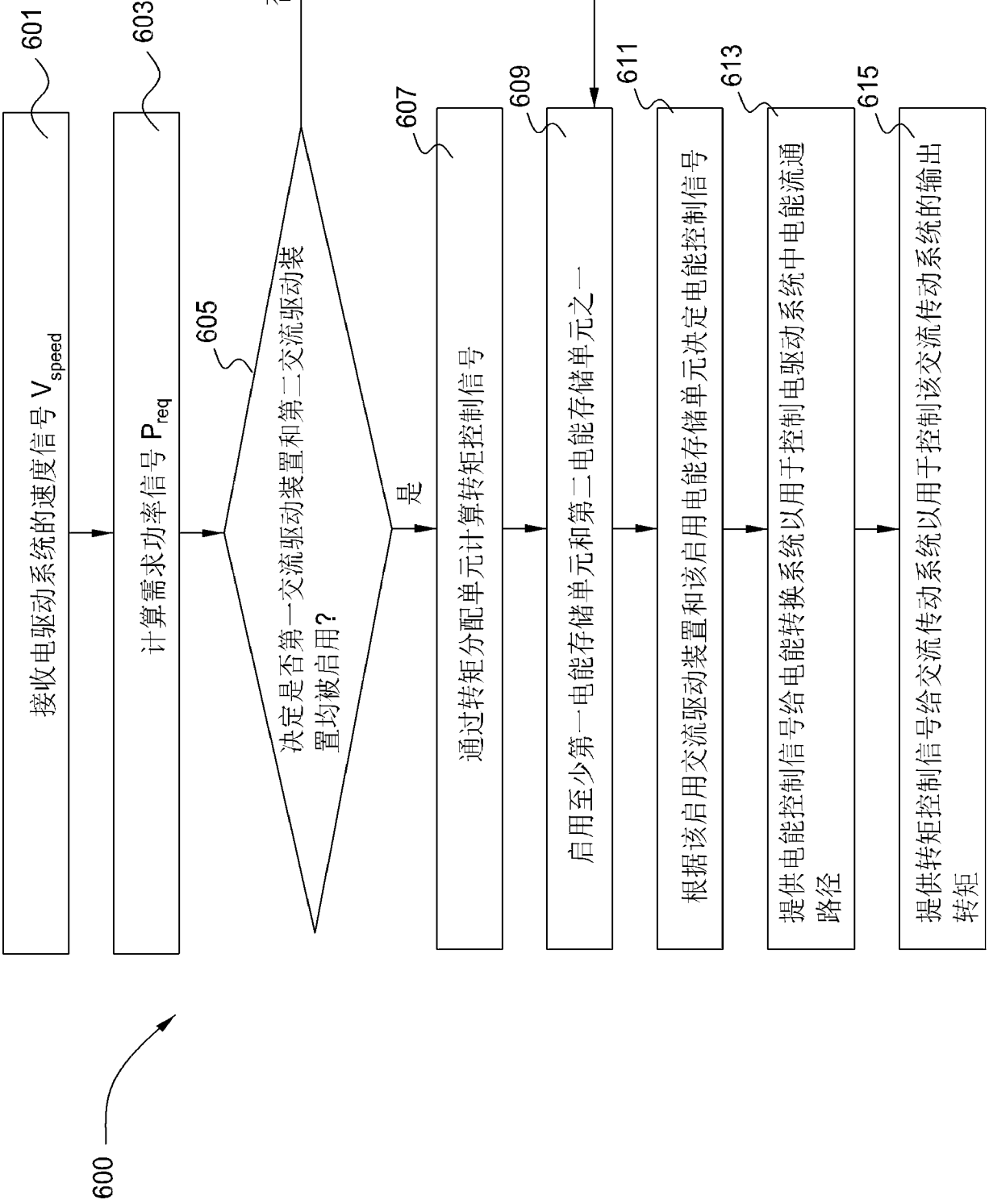


图 6

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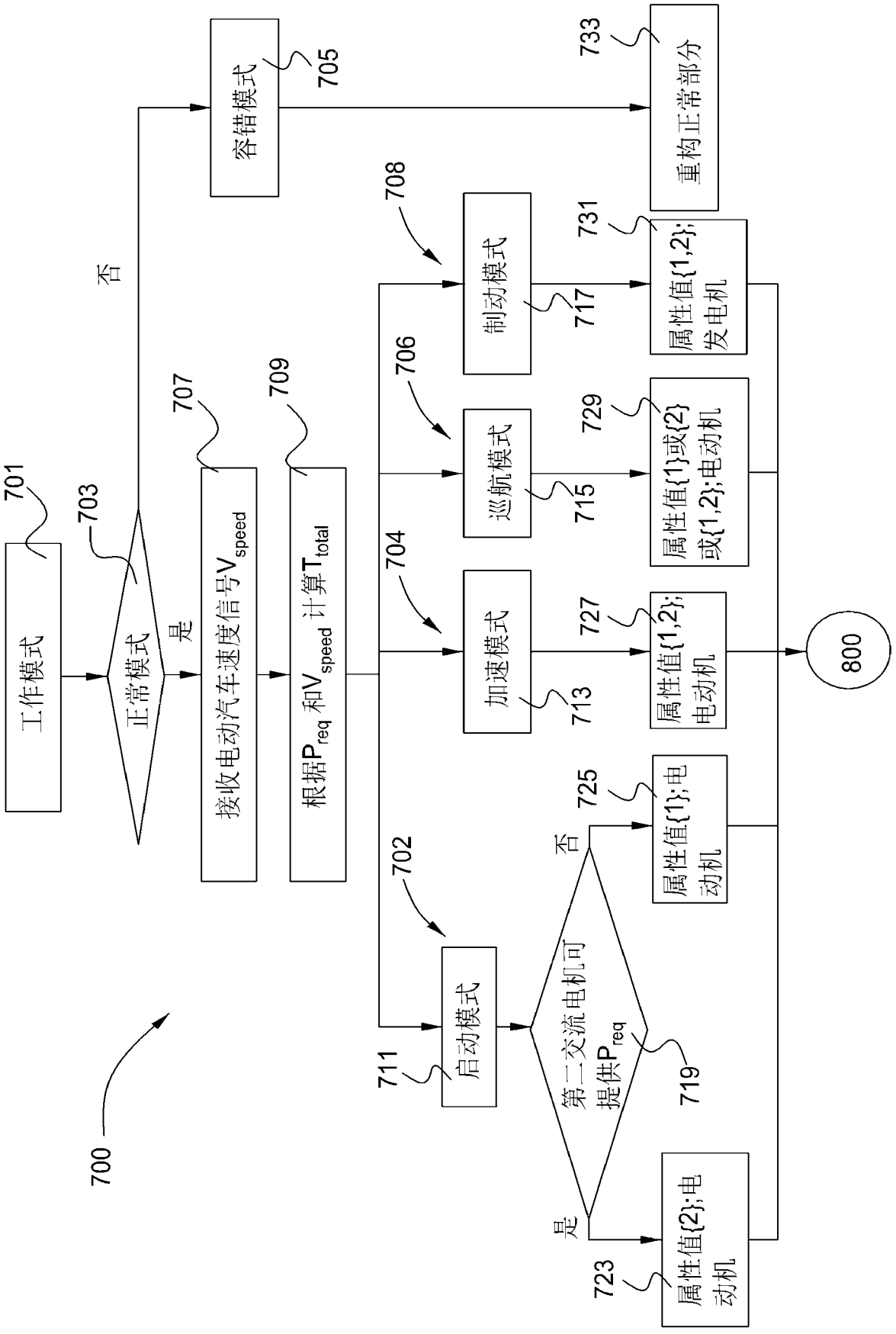


图 7

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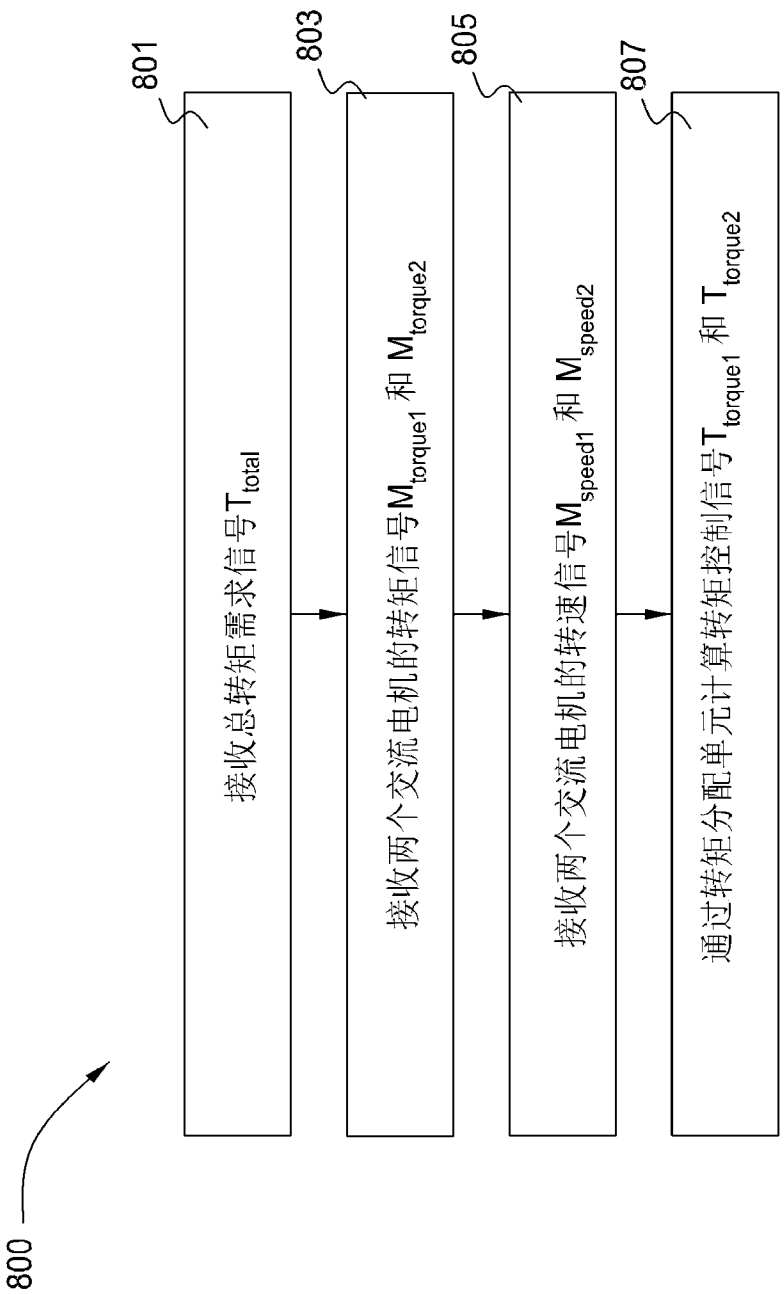


图 8

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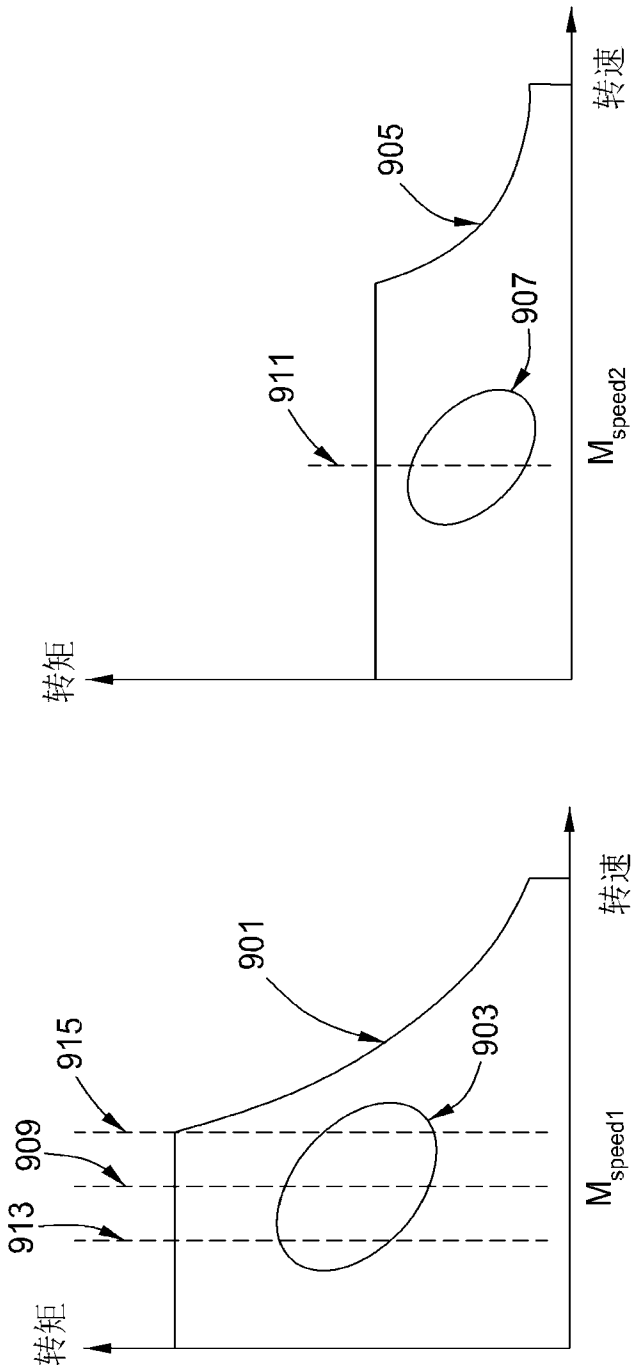


图 9

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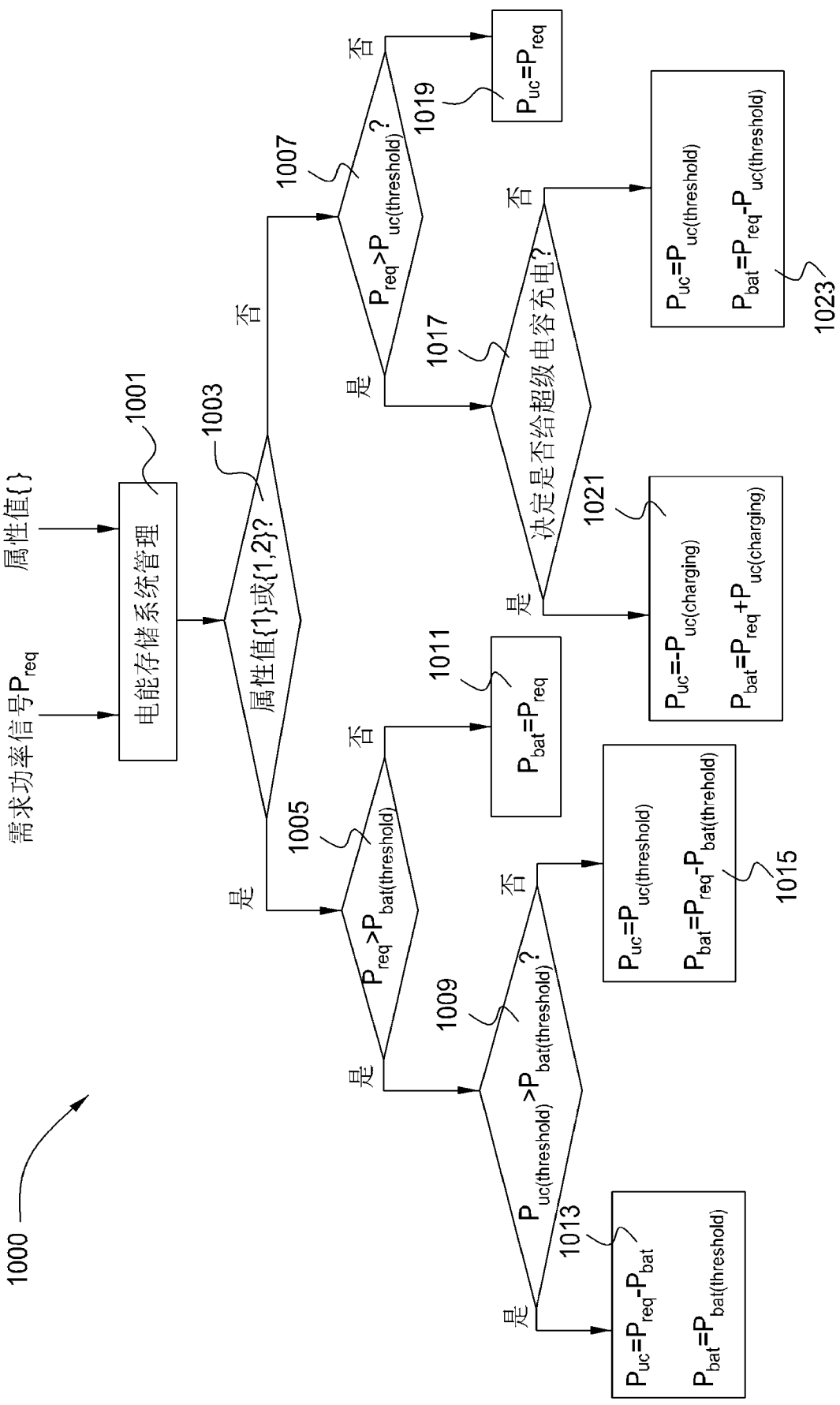


图 10

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Application Number	14094086
Filing Date	2013-12-02
First Named Inventor	Jian Zhou et al.
Art Unit	2837
Examiner Name	Chan, Kawing
Attorney Docket Number	256975-2

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	2	20090242289	A1	2009-10-01	MURTY	
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Electromagnetic Transient Simulation of Hybrid Electric Vehicles

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Abstract **— The paper presents a procedure for modeling emerging hybrid and electric vehicle drive-trains in a transient simulation program. The benefit of such models is that they enable detailed studies to be carried out on the performance of the drive-train through detailed modeling of drive motors, power converters, and energy storage subsystems. The models also account for external mechanical forces on the vehicle, allowing tests such as acceleration, hill climbing and standard drive cycles to be done. A transient simulation model of a dual drive, series hybrid electric vehicle is developed and presented. The paper also presents simulation results for this vehicle and assesses their significance.**

Index Terms **— Electromagnetic transient simulation, hybrid electric vehicle, modeling, road-vehicle electric propulsion.**

I. Introduction

Transient simulation programs (such as EMTDC and EMTP) are computer tools for the analysis and design of highly complex electrical systems [1]. They were originally developed to study transient phenomena in conventional power systems; however, with the continuing expansion of power electronics into power systems and industrial drives, transient simulation tools have found many new applications in the analysis and design of these systems as well [2, 3].

A new breed of small-scale, complex power systems is emerging with the introduction of hybrid and electric propulsion systems in the automotive industry. With unpredictably rising oil prices, tightening environmental legislation, and fuel cell technology that is more than a decade away, automotive designers are rushing to develop hybrid vehicles. The use of electric machines, power electronics and energy storage within a drive-train can help meet these challenges.

In hybrid drive-trains, complex electrical systems are intimately linked to the mechanical systems of the vehicle, and it is expected that analysis and design of these systems will become increasingly complex as the state of the art evolves. To deal with this complexity, specialized analysis tools are required.

The paper presents a procedure for modeling hybrid drive-trains in a transient simulation program. Accurate time-domain models of the drive components, such as electric motors, power electronics, and energy storage devices are developed and interfaced with accurate models of the mechanical systems of the vehicle. External effects, such as the air-drag and rolling resistance forces, are also modeled. The developed models will enable a wide range of experiments to be carried out, including acceleration and deceleration tests, and estimation of fuel economy.

These models enable the drive-train designer to accurately assess the performance of a perceived design prior to prototyping, thus shortening the design cycle and saving cost. The paper demonstrates the procedure with a series hybrid drive-train that is used in a small, single-passenger, three-wheel parking patrol vehicle. The performance of the hybrid drive-train is assessed by running a number of simulated vehicle tests.

II. Hybrid Electric Vehicle Topologies

There are two common templates used to classify hybrid electric vehicle designs: the series hybrid and the parallel hybrid [4]. Although there are many variations of these designs in practice, it is usually possible to classify a hybrid design into one or a combination of both these categories.

A. The Series Hybrid Topology

The series hybrid topology is shown in Fig. 1. The arrows indicate the direction of power flow between components. In this scheme, an electric drive provides propulsion to the wheels. The electric motors are supplied from energy storage, with the engine and generator used to recharge this storage as required. The main benefit of this design is that the gas engine is either entirely off or runs at an optimal operating point (in terms of supplied torque and rotational speed) where it is most efficient [5].

The series topology relies heavily on large energy storage, and requires a high-power electric-drive system. The topology is suited to lower speed driving under erratic stop-and-go conditions; an electric-drive system can supply torque at low speeds with much higher efficiency than a conventional engine and transmission.

This work was supported in part by an NSERC IPS, the Province of Manitoba, and Westward Industries Ltd.

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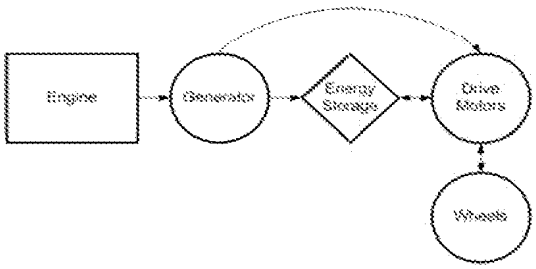


Fig. 1. Series hybrid topology

Bidirectional power converters allow some of the vehicle's kinetic energy to be recovered during braking. During this time, the drive motors are operated as generators, and power is returned to the energy storage unit. This is called regenerative braking. In contrast to this, conventional braking dissipates all kinetic energy as heat.

B. The Parallel Hybrid Topology

The parallel hybrid topology is shown in Fig. 2. The arrows indicate direction of power flow between components. This scheme is characterized by having two or more paths that can deliver mechanical power to the wheels [6]. This topology sees more diversity in implementation than the series hybrid, as evidenced by Fig. 2. Since the propulsion is only *assisted* by the electric motors, the electric systems and energy storage can be rated at a lower power than for series hybrid. This can result in cost, weight, and space savings over a similar performing series hybrid.

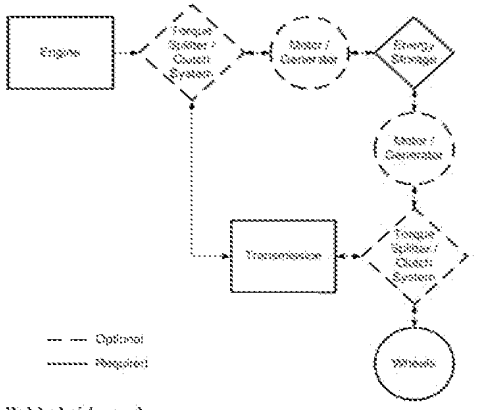


Fig. 2. Parallel hybrid topology

At high speeds, such as in highway driving, power can be delivered directly from the engine to the wheels, rather than by conversion to and from electricity as in the series hybrid. For lower speeds and stop-and go driving, the electrical drive is used heavily, allowing the engine to be switched off to eliminate idling [6].

III. Performance Evaluation of a Vehicle Design

Performance of a vehicle is usually evaluated in terms of a number a measurable indices, including fuel economy, acceleration, handling, braking, and emissions. Various tests are devised to evaluate the performance measures, and results are used for verification of design specifications and benchmarking. The performance of a vehicle with a particular hybrid drivetrain can be evaluated through a similar set of tests as well.

A. Vehicle Acceleration

Handling and braking performance are dependant on a range of systems in the vehicle, such as the suspension for example, which would require a highly complex analysis. Vehicle acceleration and hill climbing nevertheless can be tested through simple procedures. Acceleration is evaluated by measuring the length of time to accelerate from a complete stop to some reference speed, on level ground. Hill-climbing ability is evaluated by testing the vehicle's ability to climb a steep hill.

B. Fuel economy

Fuel economy and exhaust emissions are typically tested by driving the vehicle over a specific, agreed-upon speed schedule that represents typical characteristics of the final vehicle use. This test is normally done on a chassis dynamometer, where fuel use can be measured accurately and emissions can be captured in a large bag, since the vehicle is stationary. By dividing the observed emissions and fuel consumption during the test by the distance traveled, a useful measure of emissions performance and fuel economy during general use of the vehicle is predicted [7]. It is important to ensure that the particular drive-cycle used in these tests is a faithful representation of the actual use of the vehicle. However, since the vehicle may never be used in a manner exactly as in the drive-cycle, the final fuel economy estimation is likely to differ from the actual value.

Normally these tests are done using a prototype vehicle. An accurate computer model can significantly contribute to this area by enabling these tests to be performed through simulation, even prior to building a prototype. Refinement and optimization of the drive-train can also be done using such models. Overall, a highly detailed computer model can shorten the design cycle, save cost and result in a finer design, which will in turn make the prototyping and testing cycles smoother and more predictable.

IV. Development of a Simulation Model for a Series Hybrid

This study considers converting a single-passenger gasoline powered three-wheel vehicle into a series hybrid. The vehicle is used by parking patrol officers in dense urban areas. The series topology was selected because of the low average-speed and the frequent starts and stops during normal use. Further specifications for the vehicle are given in Table I.

TABLE I - Parking Patrol Vehicle Specifications

Top speed	Acceleration (0-40 km/h)	Hill climb grade	Weight
60 km/h	6 s	30%	680 kg

A computer simulation model is developed in the PSCAD/EMTDC electromagnetic transient simulation

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program. The program allows accurate modeling of various components of the design together, including the electrical drive, control, and mechanical systems. The following sections detail how such models are developed and interfaced to form the overall vehicle model.

A. Simulation Model of the Vehicular Mechanics

To develop a simulation model of an entire vehicle, it is necessary to model the mechanics of the vehicle. This will require inclusion of such factors as gear reduction, rolling resistance, air-drag and tractive forces. In this work, tire dynamics such as slip and deformity are not considered, although they could be included for more accuracy [8]. The mechanical simulation model is used to account for all the forces exerted on the vehicle. The force equations have been translated into torque to make interfacing with the electric motor models easier. The equation for road load torque is shown in (1).

$$T_L = \phi \mu m g r_{eff} \cos\alpha + m g r_{eff} \sin\alpha + \frac{1}{2} C_D A \rho r_{eff} \left(V_{speed} + V_{wind}\right)^2 \quad (1)$$

$$\phi = \begin{cases} +1 & \text{if} \quad V_{speed} > 0 \\ 0 & \text{if} \quad V_{speed} = 0 \\ -1 & \text{if} \quad V_{speed} < 0 \end{cases}$$

where μ is the coefficient of rolling resistance, m is the mass of the vehicle, g is the gravitational constant, r_{eff} is the effective tire radius adjusted for gear reductions, α is the incline angle, C_D is the drag coefficient, A is the cross sectional area, and ρ is the density of air. V_{speed} and V_{wind} are the vehicle and head wind speeds, respectively.

The load torque obtained from (1) is then summed with the traction torque from the motors and integrated numerically to find the vehicle speed. Parameters for the mechanical model have been calculated from a coast-down test of the existing gasoline vehicle, a process described in [7].

B. Series Hybrid Drive-Train

The drive-train simulation model for the vehicle is shown in Fig. 3. It includes four-quadrant motor drives (H-bridge units) for the two electric motors on the rear wheels. The associated control scheme is responsible for maintaining a torque balance between the two drive wheels at all times, to ensure vehicle stability and allow for easy cornering. The layout allows the future addition of an active stability program to improve handling and safety of the three-wheeled vehicle.

The electric motors selected for the vehicle are permanent magnet (PM) dc motors. In the simulation model, a dc motor with constant field current is used to represent the PM motor. The parameters are adjusted to ensure proper representation.

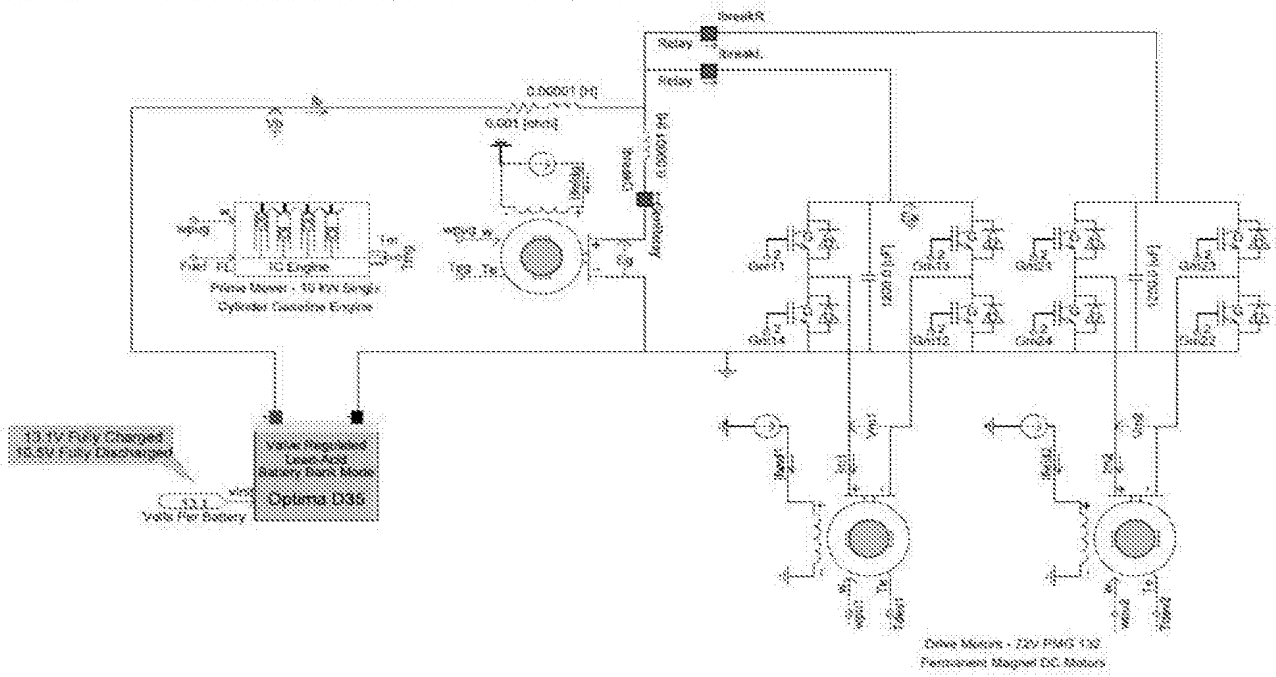


Fig. 3. PSCAD/EMTDC model of the series hybrid parking patrol vehicle drive-train.

C. Energy Storage Modeling

The energy storage unit is modeled after six 12V lead-acid batteries, forming a 72V system. The simulation model for this bank uses a two time-constant RC network for each battery in the series string, as discussed in [8]. The open-

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circuit voltage of each battery is initialized to a set value at the beginning of the simulation, allowing studies to be done at different states of charge (or even imbalances). Other types of batteries can be represented by adjusting the parameters of the RC network. Higher order, more accurate battery models can be developed using more complex RC-type circuits [9]. This type of model was used because of the short duration of the simulations, and because parameters for the model were available in the literature [8]. Fig. 4 shows the RC circuit used for each 12V battery.

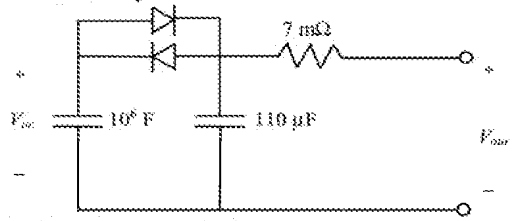


Fig. 4. The RC equivalent circuit of for each battery.

D. Internal Combustion Engine Model

Since the vehicle will host a small gasoline engine, an engine model is included in the vehicle simulation. A single-cylinder gasoline engine was modeled using a standard library block. It is paired to another PM dc machine that is used as a generator (see Fig. 1). The engine model provides a pulsating torque versus crankshaft position, the amplitude of which is modulated by the fuel input command. A flywheel model is necessary to smooth out the shaft torque, as in a real engine.

A PI controller is used to control the voltage at the generator terminals by adjusting the fuel supplied to the engine. The control scheme synchronizes the generator voltage with the battery, closes a relay to connect the generator to the live system, and then gently raises the system voltage up to the charging voltage of the battery. The layout of the system is shown in Fig. 3. This sequence has negligible effect on the vehicle performance, since the drive controllers use armature current control.

E. Drive Motor Control System

The control system of the vehicle is designed to accept control inputs that are similar to those of a conventional car; the acceleration and the brake pedal positions. These two inputs are used to provide direct torque control to the driver.

The four-quadrant PM dc motor drive control system is also implemented in the simulation model. This scheme breaks the operation of the drive motors into 5 states: (i) forward drive, (ii) reverse drive, (iii) forward regenerative, (iv) reverse regenerative, and (v) freewheeling (neutral). The determination of the state is done by considering whether the driver has selected forward or reverse, and then choosing the current and voltage polarity desired at the armature of the motor to achieve the demands of the driver.

Depending on the state of the system, a PI controller (see Fig. 5) is given positive or negative motor current error. The PI controller is used in all cases to control armature current by adjusting IGBT duty cycles. The four quadrant control block directs the PI output duty cycle to the proper switch depending on the state of the vehicle. All logic functions are coded into this control block in the simulation model.

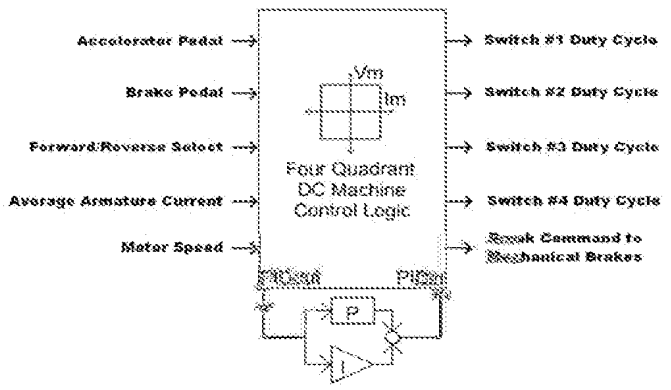


Fig. 5. Four quadrant h-bridge control system

Vehicle braking control is also performed within this block. Since regenerative braking torque is limited depending on the speed of the vehicle, the balance of driver braking request which is not met by the regenerative braking is forwarded on to the mechanical brakes, where it is subtracted from the mechanical model. This optimizes the regenerative braking system to take maximum advantage of this free energy.

V. Experiments and Simulations

A transient simulation model developed for a hybrid vehicle enables a wide range of experiments to be conducted accurately and without reliance on costly prototypes. These could include drive-cycle based fuel economy tests, acceleration, hill climbing or other operational tests such as the evaluation of control schemes and sequences. In the following sections, a number of experiments are carried out using the model and results are discussed.

A. Standard Drive-Cycle Tests

Standard drive-cycles are developed as a benchmark for comparisons between similar vehicles in areas such as average fuel consumption during normal use. Since the specific vehicle considered in this work is a parking patrol vehicle, it is subjected to frequent stops and starts and hence its performance should be assessed on a drive cycle that shows these erratic actions.

The cycle used here is the New York City Cycle Driving Schedule (NYCCDS), which is a low-speed, stop-and-go cycle originally developed for city busses and garbage trucks. The vehicle application used in this study has a similar drive cycle. As shown in Fig. 6, the drive cycle has a top speed below 45 km/h and features frequent acceleration and deceleration, making it a representative test for parking patrol use.

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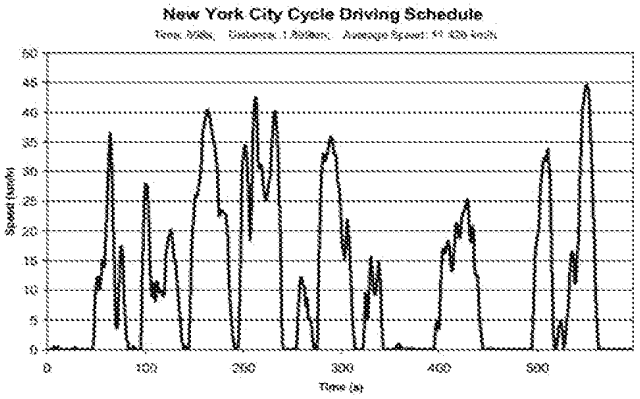


Fig. 6. The New York City Cycle Driving Schedule

In a real situation, the driver is not following a drive cycle, but instead the drive cycle is a natural product of the driver's decision to speed up or slow down. For the simulation model the situation is backwards, since the speed-up and slow-down decisions must be made by a controller in order to achieve the set drive cycle. The difference between these two situations seems subtle at first, but the smoothness of the applied accelerating and braking commands can be very different, and this has a significant effect on efficiency.

For a poorly tuned controller, a significant amount of oscillation in the use of acceleration and braking to maintain the speed close to the drive cycle is wasteful, and leads to an inaccurate prediction of energy consumption. In other words, a well-tuned control system, which is very accurate but also very smooth, should be used to model the driver. The challenge is then to design a control system in such a way to closely resemble an actual human driver who knows where they are driving.

In order to obtain a smooth trajectory-following control system, an optimized PID controller is used. The gain and the time constants of the controller are tuned using the optimization routines embedded in the simulation program [10]. The optimized drive cycle controller, or auto-pilot, is then used in a simulation to drive the vehicle over the specified course.

The graphs in Figs. 7 to 10 show the performance of the vehicle following the NYCCDS with and without regenerative braking, respectively. The speed plots in Figs. 8 and 10 show the vehicle speed and driving cycle are almost exactly overlaid. Also on these graphs is a plot of the amp-hours consumed by the vehicle during the test. With regenerative braking, a significant amount of energy is returned to the battery during braking. The battery current and voltage (Figs. 7 and 9) show that the battery voltage can change a great deal as large amounts of current are removed or returned to the batteries.

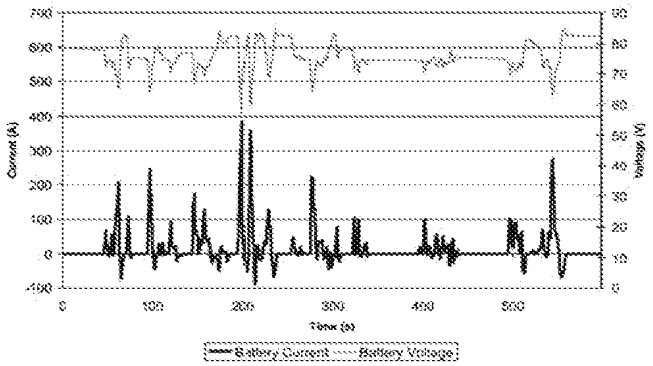


Fig. 7. Battery current and voltage with regeneration

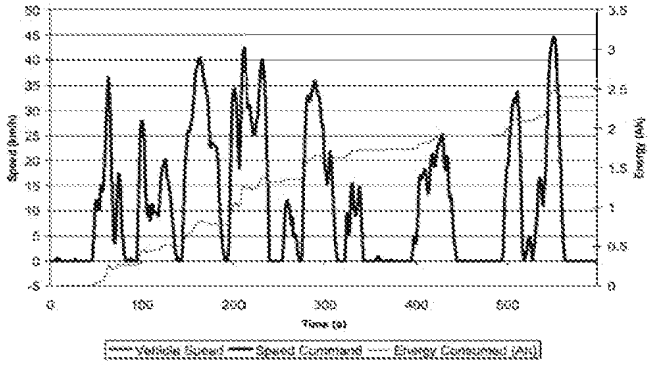


Fig. 8. Vehicle speed and energy consumption with regeneration

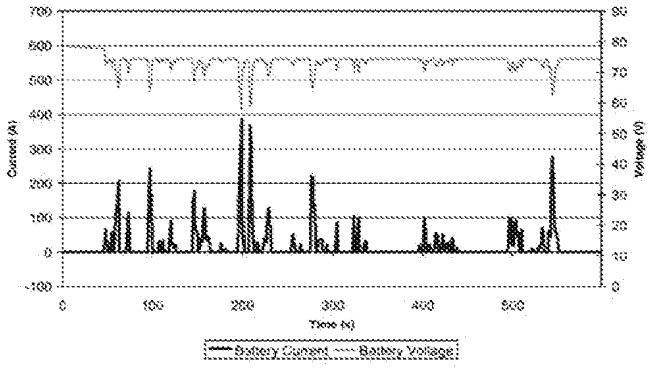


Fig. 9. Battery current and voltage without regeneration

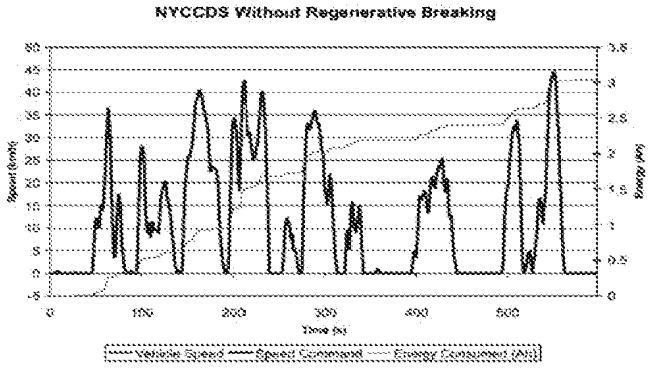


Fig. 10. Vehicle speed and energy consumption without regeneration

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By integrating the battery current and vehicle speed during the simulation, the average amp-hours per kilometer were obtained. Table II summarizes the simulation results obtained using the standard drive-cycle tests.

TABLE II - COMPARISON OF DRIVE-CYCLE SIMULATIONS WITH AND WITHOUT REGENERATIVE BRAKING

Parameter	Regenerative Braking	Conventional Braking	Economy Improvement
Distance (km)	1.897	1.897	26.2 %
Energy (Ah)	2.403	3.034	
Economy (Ah/km)	1.267	1.599	

B. Acceleration Test

In the case presented here, the short-term current limit of the drive is 350A. Fig. 11 shows the simulated acceleration test results. As seen from the graphs, the gradual depression of the battery voltage and the increase of the back-emf (proportional to motor speed) of the motors make it impossible to maintain 350A after the first 2s. This has an important effect on acceleration performance.

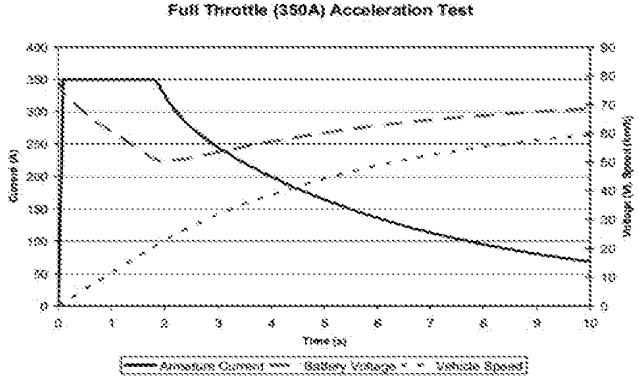


Fig. 11. Full throttle acceleration test achieves 0-40 km/h in 4.4s

C. Hill Climbing Test

The hill climbing performance is evaluated in Fig. 12. The specifications of the vehicle call for the ability to climb a 30% grade, which is equivalent to a 16.7° slope. As shown, the drive system is capable of slowly climbing this steep incline.

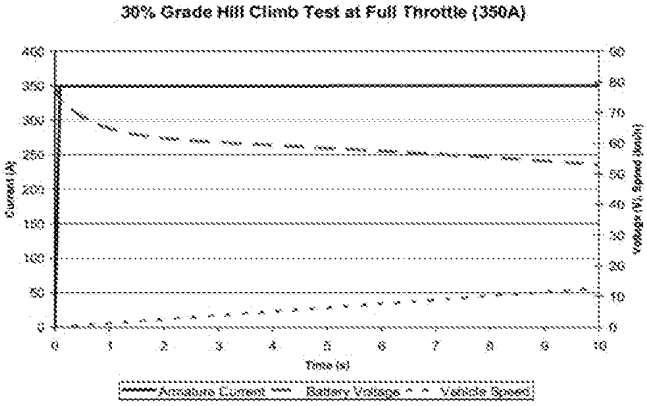


Fig. 12. Simulation of a 30% grade hill climb, 350A armature current

VI. CONCLUSIONS

A transient simulation procedure for modeling hybrid drive-trains was presented. The procedure was demonstrated using a series hybrid vehicle topology. Electromagnetic transient simulation tools were used to model, design, and test the system. By designing the simulated controls to be driver-oriented, a realistic perception of the vehicle operation was gained. Various performance attributes were evaluated by simulation against a set of specifications, raising confidence in the design. This detailed simulation approach has the ability to shorten hybrid development time and reduce cost of prototyping cycles.

VII. ACKNOWLEDGMENT

The authors gratefully acknowledge the contributions made by E. Dirks from the ECE Department at the University of Manitoba, and S. Griffin, R. Thomas and L. Mauws from Westward Industries Ltd.

VIII. REFERENCES

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Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 454

Electronic Acknowledgement Receipt

EFS ID:	22989444
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	52082
Filer:	Peter DiMauro/Colin Morris
Filer Authorized By:	Peter DiMauro
Attorney Docket Number:	256975
Receipt Date:	23-JUL-2015
Filing Date:	02-DEC-2013
Time Stamp:	16:51:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	256975_2_US_IDS_Form_22JUL2015.pdf	612605 2fafd154ee40a5eaf5917c8b40aecde5a0cf3107	no	5

Warnings:	
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2	Non Patent Literature	256975_2_US_IDS_NPL_Northcott_22JUL2015.pdf	2402988 7bcfe17c7919adc870213b0e2c6e04d1a3ca6b8d	no	6

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/094,086	12/02/2013	Jian Zhou	256975

CONFIRMATION NO. 1896

POA ACCEPTANCE LETTER

52082
General Electric Company
GE Global Patent Operation
3135 Easton Turnpike
Fairfield, CT 06828

OC000000074061035

Date Mailed: 03/19/2015

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/10/2015.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/qtran/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
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Cc: PAIR_eOfficeAction@uspto.gov
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Mar 19, 2015 05:29:11 AM

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Application	Document	Mailroom Date	Attorney Docket No.
14094086	N570	03/19/2015	256975

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Application Number	14/094086
Filing Date	December 2, 2013
First Named Inventor	Jian Zhou
Title	Electric Drive System and Energy Management Method
Art Unit	
Examiner Name	
Attorney Docket Number	256975

SIGNATURE of Applicant or Patent Practitioner

Signature	/ptd47323/	Date (Optional)	2014-11-24
Name	Peter T. DiMauro	Registration Number	47323
Title (if Applicant is a juristic entity)	Senior Patent Agent, General Electric Company		
Applicant Name (if Applicant is a juristic entity)	General Electric Company		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

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Application Number	Filing Date

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I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

General Electric Company

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	/ptd47323/	Date (Optional)	March 6, 2015
Name	Peter T. DiMauro		
Title	Senior Patent Agent, General Electric Company		

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Electronic Acknowledgement Receipt

EFS ID:	21689174
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	52082
Filer:	Peter DiMauro/Eileen McCaughern
Filer Authorized By:	Peter DiMauro
Attorney Docket Number:	256975
Receipt Date:	10-MAR-2015
Filing Date:	02-DEC-2013
Time Stamp:	17:15:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	256975_2_US_revRsp_CorrectPOA-5MAR2015.pdf	36845 e6fd042fb3a7dc9de65dfa8af17dd1d54e390398	no	1

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant of Jian Zhou et al:

Application No.: 14/094086 Atty. Docket No.: 256975

Title: ELECTRIC DRIVE SYSTEM AND ENERGY MANAGEMENT METHOD Filing Date: 2 Dec 2013

VIA EFS

Dear Sir or Madam:

In response to the "Notice Regarding Power of Attorney" mailed on August 29, 2014, applicant respectfully submits a corrected Power of Attorney which identifies General Electric Company as the assignee of the entire interest.

The undersigned patent agent may be contacted at the number below to facilitate the resolution of any matters.

Dated: 5 March 2015

Respectfully submitted,

/ptd47323/

Peter T. DiMauro
Senior Patent Agent for Applicant
Reg. No. 47,323

General Electric Company
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14/094,086	12/02/2013	Jian Zhou	256975

CONFIRMATION NO. 1896

IMPROPER CPOA LETTER

52082
General Electric Company
GE Global Patent Operation
2 Corporate Drive, Suite 648
Shelton, CT 06484

OC000000070414604

Date Mailed: 08/29/2014

NOTICE REGARDING POWER OF ATTORNEY

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/sleutchit/

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From: PAIR_eOfficeAction@uspto.gov
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Aug 29, 2014 05:22:56 AM

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Application	Document	Mailroom Date	Attorney Docket No.
14094086	N572	08/29/2014	256975

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Application Number	14/094086
Filing Date	December 2, 2013
First Named Inventor	Jian Zhou
Title	Electric Drive System and Energy Management Method
Art Unit	
Examiner Name	
Attorney Docket Number	256975

SIGNATURE of Applicant or Patent Practitioner

Signature	/ptd47323/	Date (Optional)	2014-08-21
Name	Peter T. Dimauro	Registration Number	47323
Title (if Applicant is a juristic entity)	Patent Agent		
Applicant Name (if Applicant is a juristic entity)	General Electric Company		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Document Description: Power of Attorney

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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date
14/094086	12-2-2013

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☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 52082

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

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OR

☐ The address associated with Customer Number:

OR

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Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	/ptd47323/	Date (Optional)	2014-08-21
Name	Peter T. Dimauro		
Title	Patent Agent		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ Total of 1 forms are submitted.

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No more than ten (10) patent practitioners total may be appointed as set forth below by name and registration number. This page need not be submitted if appointing the Patent Practitioner(s) associated with a Customer Number (see form PTO/AIA/82B):

Name	Registration Number

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Electronic Acknowledgement Receipt

EFS ID:	19932024
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	52082
Filer:	Peter DiMauro/Eileen McCaughern
Filer Authorized By:	Peter DiMauro
Attorney Docket Number:	256975
Receipt Date:	21-AUG-2014
Filing Date:	02-DEC-2013
Time Stamp:	17:04:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	256975-US-revPOA.pdf	177316 4bfa7d2257959ca4f02519fd622099849ad758e0	no	4

Warnings:	
Information:	

Total Files Size (in bytes):	177316

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National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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Application	Document	Mailroom Date	Attorney Docket No.
14094086	NTC.PUB	06/05/2014	256975

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/094,086	12/02/2013	Jian Zhou	256975

CONFIRMATION NO. 1896

52082
General Electric Company
GE Global Patent Operation
2 Corporate Drive, Suite 648
Shelton, CT 06484

PUBLICATION NOTICE

OC00000068839157

Title: Electric Drive System and Energy Management Method

Publication No.US-2014-0152225-A1
Publication Date:06/05/2014

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 475

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/094,086	12/02/2013	Jian Zhou	256975

CONFIRMATION NO. 1896

IMPROPER CPOA LETTER

52082
General Electric Company
GE Global Patent Operation
2 Corporate Drive, Suite 648
Shelton, CT 06484

OC000000067328797

Date Mailed: 04/01/2014

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the power of attorney filed 03/20/2014. The power of attorney in this application is not accepted for the reason(s) listed below:

- The revocation is not signed by the applicant, the assignee of the entire interest, or one particular principal attorney having the authority to revoke.

/snguyen/

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Page 476

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Apr 01, 2014 05:37:08 AM

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STATE INTELLECTUAL PROPERTY OFFICE
OF THE PEOPLE'S REPUBLIC OF CHINA

证　明

本证明之附件是向本局提交的下列专利申请文件副本。

请　　号：201210509493.2

请 类 型：发明专利

创造 名称：电驱动系统及其能量管理方法

请　　日：2012年12月03日

请　　人：通用电气公司

发　设计人：周健、许飞、刘栋、邱海、康鹏举

局长
申长雨

2014 年 03 月 06 日

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 478

权 利 要 求 书

1. 一种电驱动系统，其特征在于：

该电驱动系统包括电能存储系统，电能转换系统，交流传动系统和能量管理系统；

该电能存储系统包括第一电能存储单元和第二电能存储单元，该第一电能存储单元用于提供或者接收第一电能，该第二电能存储单元用于提供或者接收第二电能；

该电能转换系统与该电能存储系统连接，该电能转换系统用于将一种输入电能转换成一种输出电能，该电能转换系统包括电能转换装置，该电能转换装置包括第一端口，第二端口，第三端口和第四端口，该第一端口与该第一电能存储单元连接，该第二端口与该第二电能存储单元连接；

该交流传动系统与该电能转换系统连接，该交流传动系统用于将该电能转换系统的输出电能转换成机械转矩，该交流传动系统包括第一交流驱动装置和第二交流驱动装置，该第一交流驱动装置与该电能转换装置的第三端口连接，该第一交流驱动装置用于提供或者接收第一机械转矩，该第二交流驱动装置与该电能转换装置的第四端口连接，该第二交流驱动装置用于提供或者接收第二机械转矩；

该能量管理系统与该电能存储系统，该交流传动系统和该电能转换系统通讯，该能量管理系统用于提供控制信号。

2. 如权利要求 1 所述的电驱动系统，其中：该电驱动系统包括预充电开关装置，该预充电开关装置连接在该第一电能存储单元和该第二电能存储单元之间，该预充电开关装置用于在该第一电能存储单元和该第二电能存储单元之间提供电能流通路径。

3. 如权利要求 1 所述的电驱动系统，其中：该电能转换装置包括单独的电能转换装置。

4. 如权利要求 1 所述的电驱动系统，其中：该电能转换装置包括第一电能转换装置和第二电能转换装置，该第一电能转换装置通过该第一端口与

1002
96.7
Toyota Motor Corp. v. Bunker Hill Technologies, LLC
Page 479

该第一电能存储单元连接，该第一电能转换装置通过该第三端口与该第一交流驱动装置连接；该第二电能转换装置与该第一电能转换装置并联连接，该第二电能转换装置通过该第二端口与该第二电能存储单元连接，该第二电能转换装置通过该第四端口与该第二交流驱动装置连接。

5. 如权利要求 1 所述的电驱动系统，其中：该电能转换装置包括第一电能转换装置和第二电能转换装置，该第一电能转换装置通过该第一端口与该第一电能存储单元连接，该第一电能转换装置通过该第二端口与该第二电能存储单元连接，该第一电能转换装置通过该第四端口与该第二交流驱动装置连接；该第二电能转换装置与该第一电能转换装置串联连接，该第二电能转换装置通过该第三端口与该第一交流驱动装置连接。

6. 如权利要求 1 所述的电驱动系统，其中：该第一交流驱动装置包括第一交流电机和第一直流/交流逆变器，该第一交流电机包括感应电机和永磁电机其中之一，该第一直流/交流逆变器与该第一交流电机连接，该第一直流/交流逆变器用于给该第一交流电机提供交流电；该第二交流驱动装置包括第二交流电机和第二直流/交流逆变器，该第二交流电机包括感应电机和永磁电机其中之一，该第二直流/交流逆变器与该第二交流电机连接，该第二直流/交流逆变器用于给该第二交流电机提供交流电。

7. 如权利要求 6 所述的电驱动系统，其中：该第一交流驱动装置用于独立给第一负载提供机械转矩；该第二交流驱动装置用于独立给第二负载提供机械转矩。

8. 如权利要求 1 所述的电驱动系统，其包括功率分配装置，该功率分配装置连接在该交流传动系统和负载之间，该功率分配装置包括：第一机械端口，第二机械端口和第三机械端口，该第一机械端口与该第一交流驱动装置连接，该第一机械端口用于接收来自该第一交流驱动装置的第一机械转矩；该第二机械端口与该第二交流驱动装置连接，该第二机械端口用于接收来自该第二交流驱动装置的第二机械转矩；该第三机械端口与该负载连接，该第三机械端口用于提供第三机械转矩给该负载，该功率分配装置用于将该第一机械转矩和该第二机械转矩进行结合，并输出

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由该第一机械转矩和该第二机械转矩结合得到的该第三机械转矩。

9. 如权利要求 8 所述的电驱动系统，其中：该功率分配装置用于将该第三机械转矩分解为该第一机械转矩和该第二机械转矩，该第三机械端口用于接收来自负载提供的该第三机械转矩；该第一机械端口用于给该第一交流驱动装置提供该第一机械转矩，该第一机械转矩被转换为电功率以给该电能存储系统充电；该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电。

10. 如权利要求 8 所述的电驱动系统，其中：该功率分配装置用于将该第一机械转矩分解为该第二机械转矩和该第三机械转矩，该第一机械端口用于接收来自该第一交流驱动装置提供的该第一机械转矩；该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电；该第三机械端口用于给该负载提供该第三机械转矩。

11. 一种能量管理方法，其特征在于：该方法至少包括如下步骤：

至少根据测量到的电驱动系统的速度启用第一交流驱动装置和第二交流驱动装置当中至少一个装置；

启用第一电能存储单元和第二电能存储单元当中至少一个单元；以及

发送电能控制信号给电能转换系统，该电能控制信号用于控制电驱动系统中的电能流通路径，控制该电能流通路径的过程包括如下步骤：至少由该电能转换装置的第一端口和第二端口当中一个端口提供功率给该电能转换系统或者从该电能转换系统接收功率；以及至少由该电能转换装置的第三端口和第四端口当中一个端口提供功率给该电能转换系统或者从该电能转换系统接收功率。

12. 如权利要求 11 所述的能量管理方法，其中：该控制电能流通路径的过程包括如下步骤：

将电能存储系统产生的电能通过该第一交流驱动装置转换成第一机械转矩；

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通过功率分配装置将该第一机械转矩分解为第二机械转矩和第三机械转矩；

将该第二机械转矩提供给该第二交流驱动装置，该第二机械转矩被转换为电功率以给该第二电能存储单元充电；以及

将该第三机械转矩提供给负载。

13. 如权利要求 11 所述的能量管理方法，其中：该能量管理方法包括：

通过转矩分配单元计算得到第一转矩控制信号和第二转矩控制信号；以及

将该第一转矩控制信号和该第二转矩控制信号分别发送给该第一交流驱动装置和该第二交流驱动装置。

14. 如权利要求 13 所述的能量管理方法，其中：该转矩分配单元包括转矩分配算法，该转矩分配算法根据该第一驱动装置和该第二驱动装置中的第一交流电机和第二交流电机的效率曲线图制定出查询表格，该查询表格定义了该第一交流电机和该第二交流电机运行的高效率区域。

15. 如权利要求 11 所述的能量管理方法，至少包括以下步骤中的一者：

在容错模式下，启用该第一交流驱动装置和该第二交流驱动装置中至少一个装置，并启用该第一存储单元和该第二存储单元至少一个单元；

在启动模式下，当需求功率在该第二交流驱动装置能力范围内时启用该第二交流驱动装置；

在启动模式下，当该需求功率超出该第二交流驱动装置能力范围时启用该第一交流驱动装置；

在加速模式下，启用该第一交流驱动装置和该第二交流驱动装置；

在巡航模式下，启用该第一交流驱动装置和该第二交流驱动装置至少一个装置；以及

在制动模式下，启用该第一交流驱动装置和该第二交流驱动装置。

16. 一种电驱动系统，其特征在于：

该电驱动系统包括电能存储系统，电能转换系统，交流传动系统，功率分配装置和能量管理系统；

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该电能存储系统至少包括一个电能存储单元，该电能存储系统用于提供或接收电能；

该电能转换系统与该电能存储系统连接，该电能转换系统用于将一种输入电能转换成一种输出电能；

该交流传动系统与该电能转换系统连接，该交流传动系统用于将该电能转换系统的输出电能转换成机械转矩，该交流传动系统包括第一交流驱动装置和第二交流驱动装置，该第一交流驱动装置和该第二交流驱动装置与该电能转换系统连接，该第一交流驱动装置用于提供或者接收第一机械转矩，该第二交流驱动装置用于提供或者接收第二机械转矩；

该能量管理系统与该电能存储系统，该交流传动系统和该电能转换系统通讯，该能量管理系统用于提供控制信号；

该功率分配装置连接在该交流传动系统和负载之间，该功率分配装置包括第一机械端口，第二机械端口和第三机械端口，该第一机械端口与该第一交流驱动装置连接，该第二机械端口与该第二交流驱动装置连接，该第三机械端口与该负载连接，该功率分配装置用于将该第一机械转矩分解为该第二机械转矩和该第三机械转矩，该第一机械端口用于接收来自该第一交流驱动装置提供的该第一机械转矩；该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电；该第三机械端口用于给该负载提供该第三机械转矩。

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说　明　书

电驱动系统及其能量管理方法

技术领域

本发明公开的实施方式涉及电驱动系统及其能量管理方法，可用于多种动力系统例如电动汽车系统。

背景技术

随着能源危机和化石燃料尾气造成的环境污染问题的加重，电动汽车系统受到越来越多的关注。在电动汽车系统中，至少部分化石燃料可被诸如铅酸蓄电池，飞轮储能装置，燃料电池等能源代替。电驱动系统是电动汽车系统的重要组成部分。在一些电驱动系统中，多种交流电机例如感应电机，永磁电机，开关磁阻电机常用于将电能转换为机械转矩。为保证电动汽车系统具备高效率和高性价比等特征，需选择合适的电源，合适的电机以及合适的连接方式。

目前，大多数的电驱动系统包括以下几种结构，一种为一个单电能存储单元和单电机，另一种为双电能存储单元和单电机。然而，一方面，由于受到电能存储单元自身充/放电特性的限制，电能存储单元往往具有能量低，充电效率低，寿命短等缺点，因此单电能存储单元不能同时满足能量和需求功率。另一方面，单电机也不能保证在整个工作区间内都保持高效率运行。现有的电动汽车系统为了保证电动汽车可拥有加速快，行驶里程长等特点，存在电驱动系统体积大，成本高，效率低等问题。

因此，有必要提供一种改进的系统和方法来解决上述技术问题。

发明内容

鉴于上面提及的技术问题，本发明的一个方面在于提供一种改进的电驱动系统。该电驱动系统包括电能存储系统，电能转换系统，交流传动系统和能量管理系统。该电能存储系统包括第一电能存储单元和第二电能存储单元，该第一电能存储单元用于提供或者接收第一电能，该第二电能存储单元用于提供或者接收第二电能。该电能转换系统与该电能存储系统连接，该电能转

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换系统用于将一种输入电能转换成一种输出电能，该电能转换系统包括电能转换装置，该电能转换装置包括第一端口，第二端口，第三端口和第四端口，该第一端口与该第一电能存储单元连接，该第二端口与该第二电能存储单元连接。该交流传动系统与该电能转换系统连接，该交流传动系统用于将该电能转换系统的输出电能转换成机械转矩，该交流传动系统包括第一交流驱动装置和第二交流驱动装置，该第一交流驱动装置与该电能转换装置的第三端口连接，该第一交流驱动装置用于提供或者接收第一机械转矩，该第二交流驱动装置与该电能转换装置的第四端口连接，该第二交流驱动装置用于提供或者接收第二机械转矩；该能量管理系统与该电能存储系统，该交流传动系统和该电能转换系统通讯，该能量管理系统用于提供控制信号。

如上所述改进的电驱动系统进一步包括预充电开关装置，该预充电开关装置连接在该第一电能存储单元和该第二电能存储单元之间，该预充电开关装置用于在该第一电能存储单元和该第二电能存储单元之间提供电能流通路径。

如上所述改进的电驱动系统，其中该电能转换装置包括单独的电能转换装置。

如上所述改进的电驱动系统，其中该电能转换装置包括第一电能转换装置和第二电能转换装置，该第一电能转换装置通过该第一端口与该第一电能存储单元连接，该第一电能转换装置通过该第三端口与该第一交流驱动装置连接；该第二电能转换装置与该第一电能转换装置并联连接，该第二电能转换装置通过该第二端口与该第二电能存储单元连接，该第二电能转换装置通过该第四端口与该第二交流驱动装置连接。

如上所述改进的电驱动系统，其中该电能转换装置包括第一电能转换装置和第二电能转换装置，该第一电能转换装置通过该第一端口与该第一电能存储单元连接，该第一电能转换装置通过该第二端口与该第二电能存储单元连接，该第一电能转换装置通过该第四端口与该第二交流驱动装置连接；该第二电能转换装置与该第一电能转换装置串联连接，该第二电能转换装置通过该第三端口与该第一交流驱动装置连接。

如上所述改进的电驱动系统，其中该第一交流驱动装置包括第一交流电机和第一直流/交流逆变器，该第一交流电机包括感应电机和永磁电机其中之一，该第一直流/交流逆变器与该第一交流电机连接，该第一直流/交流逆变器

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用于给该第一交流电机提供交流电；该第二交流驱动装置包括第二交流电机和第二直流/交流逆变器，该第二交流电机包括感应电机和永磁电机其中之一，该第二直流/交流逆变器与该第二交流电机连接，该第二直流/交流逆变器用于给该第二交流电机提供交流电。

如上所述改进的电驱动系统，其中该第一交流驱动装置用于独立地给第一负载提供机械转矩；该第二交流驱动装置用于独立地给第二负载提供机械转矩。

如上所述改进的电驱动系统进一步包括功率分配装置，该功率分配装置连接在该交流传动系统和负载之间，该功率分配装置包括：第一机械端口，第二机械端口和第三机械端口，该第一机械端口与该第一交流驱动装置连接，该第一机械端口用于接收来自该第一交流驱动装置的第一机械转矩；该第二机械端口与该第二交流驱动装置连接，该第二机械端口用于接收来自该第二交流驱动装置的第二机械转矩；该第三机械端口与该负载连接，该第三机械端口用于提供第三机械转矩给该负载，该功率分配装置用于将该第一机械转矩和该第二机械转矩进行结合，并输出由该第一机械转矩和该第二机械转矩结合得到的该第三机械转矩。

如上所述改进的电驱动系统，其中该功率分配装置用于将该第三机械转矩分解为该第一机械转矩和该第二机械转矩，该第三机械端口用于接收来自负载提供的该第三机械转矩；该第一机械端口用于给该第一交流驱动装置提供该第一机械转矩，该第一机械转矩被转换为电功率以给该电能存储系统充电；该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电。

如上所述改进的电驱动系统，其中该功率分配装置用于将该第一机械转矩分解为该第二机械转矩和该第三机械转矩，该第一机械端口用于接收来自该第一交流驱动装置提供的该第一机械转矩；该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电；该第三机械端口用于给该负载提供该第三机械转矩。

本发明的另一个方面在于提供一种能量管理方法，该方法至少包括如下步骤：至少根据测量到的电驱动系统的速度启用第一交流驱动装置和第二交流驱动装置当中至少一个装置。启用第一电能存储单元和第二电能存储单元当中至少一个单元。以及发送电能控制信号给电能转换系统，该电能控制信

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号用于控制电驱动系统中的电能流通路径，控制该电能流通路径的过程包括如下步骤：至少由电能转换装置的第一端口和第二端口当中一个端口提供功率给该电能转换系统或者从该电能转换系统接收功率；以及至少由该电能转换装置的第三端口和第四端口当中一个端口提供功率给该电能转换系统或者从该电能转换系统接收功率。

如上所述的能量管理方法，其中该控制电能流通路径的过程包括如下步骤：将电能存储系统产生的电能通过该第一交流驱动装置转换成第一机械转矩。通过功率分配装置将该第一机械转矩分解为第二机械转矩和第三机械转矩。将该第二机械转矩提供给该第二交流驱动装置，该第二机械转矩被转换为电功率以给该第二电能存储单元充电。以及将该第三机械转矩提供给负载。

如上所述的能量管理方法，其中该能量管理方法包括通过转矩分配单元计算得到第一转矩控制信号和第二转矩控制信号。以及将该第一转矩控制信号和该第二转矩控制信号分别发送给该第一交流驱动装置和该第二交流驱动装置。

如上所述的能量管理方法，其中该转矩分配单元包括转矩分配算法，该转矩分配算法根据该第一驱动装置和该第二驱动装置中的第一交流电机和第二交流电机的效率曲线图制定出查询表格，该查询表格定义了该第一交流电机和该第二交流电机运行的高效率区域。

如上所述的能量管理方法，至少包括以下步骤中的一者：在容错模式下，启用该第一交流驱动装置和该第二交流驱动装置中至少一个装置，并启用该第一存储单元和该第二存储单元至少一个单元。在启动模式下，当需求功率在该第二交流驱动装置能力范围内时启用该第二交流驱动装置。在启动模式下，当该需求功率超出该第二交流驱动装置能力范围时启用该第一交流驱动装置。在加速模式下，启用该第一交流驱动装置和该第二交流驱动装置。在巡航模式下，启用该第一交流驱动装置和该第二交流驱动装置至少一个装置。以及在制动模式下，启用该第一交流驱动装置和该第二交流驱动装置。

本发明的另一个方面在于提供一种电驱动系统，该电驱动系统包括电能存储系统，电能转换系统，交流传动系统，功率分配装置和能量管理系统。该电能存储系统至少包括一个电能存储单元，该电能存储系统用于提供或接收电能。该电能转换系统与该电能存储系统连接，该电能转换系统用于将一种输入电能转换成一种输出电能。该交流传动系统与该电能转换系统连接，该

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交流传动系统用于将该电能转换系统的输出电能转换成机械转矩，该交流传动系统包括第一交流驱动装置和第二交流驱动装置，该第一交流驱动装置和该第二交流驱动装置与该电能转换系统连接，该第一交流驱动装置用于提供或者接收第一机械转矩，该第二交流驱动装置用于提供或者接收第二机械转矩。该能量管理系统与该电能存储系统，该交流传动系统和该电能转换系统通讯，该能量管理系统用于提供控制信号。该功率分配装置连接在该交流传动系统和负载之间，该功率分配装置包括第一机械端口，第二机械端口和第三机械端口，该第一机械端口与该第一交流驱动装置连接，该第二机械端口与该第二交流驱动装置连接，该第三机械端口与该负载连接，该功率分配装置用于将该第一机械转矩分解为该第二机械转矩和该第三机械转矩，该第一机械端口用于接收来自该第一交流驱动装置提供的该第一机械转矩。该第二机械端口用于给该第二交流驱动装置提供该第二机械转矩，该第二机械转矩被转换为电功率以给该电能存储系统充电；该第三机械端口用于给该负载提供该第三机械转矩。

本发明提供的电驱动系统以及能量管理方法与传统的方法相比，通过该第一电能存储单元和该第二电能存储单元的结合，至少其中之一可被启用。通过该第一交流驱动装置和该第二交流驱动装置的结合，至少其中之一可被启用。根据被启用的电能存储单元和被启用的交流驱动装置以及该电能转换系统的不同结构，该能量管理系统可产生多种电能控制信号，以便灵活的控制电能在该电驱动系统中的双向流动。通过多条电能流通路径给该电能存储系统充电可减少该电驱动系统的能量损失从而可提高该电驱动系统的效率。

附图说明

通过结合附图对于本发明的实施方式进行描述，可以更好地理解本发明，在附图中：

图 1 所示为应用于动力系统中用来驱动两个负载的电驱动系统的一种实施方式的模块示意图；

图 2 所示为应用于动力系统中用来驱动一个负载的电驱动系统的一种实施方式的模块示意图；

图 3 所示为图 1 所示的应用于电动汽车系统中的电驱动系统的一种实施方式的模块示意图；

图 4 所示为图 1 所示的应用于电动汽车系统中的电驱动系统的另一种实

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施方式的模块示意图；

图 5 所示为图 1 所示的应用于电动汽车系统中的电驱动系统的另一种实施方式的模块示意图；

图 6 所示为能量管理方法的一种实施方式的流程图；

图 7 所示为图 6 所示决定是否使第一交流电机和第二交流电机均被启用步骤的一种实施方式的流程图；

图 8 所示为图 6 所示通过转矩分配单元计算两个转矩控制信号步骤的一种实施方式的流程图；

图 9 所示为应用于图 8 所示流程图中的交流传动系统的转矩-转速曲线；以及

图 10 所示为图 6 所示启用第一电能存储单元和第二电能存储单元至少一个单元步骤的一种实施方式的流程图。

具体实施方式

以下将描述本发明的一个或者多个具体实施方式。首先要指出的是，在这些实施方式的具体描述过程中，为了进行简明扼要的描述，本说明书不可能对实际的实施方式的所有特征均作详尽的描述。应当可以理解的是，在任意一种实施方式的实际实施过程中，正如在任意一个工程项目或者设计项目的过程中，为了实现开发者的具体目标，或者为了满足系统相关的或者商业相关的限制，常常会做出各种各样的具体决策，而这也会从一种实施方式到另一种实施方式之间发生改变。此外，还可以理解的是，虽然这种开发过程中所作出的努力可能是复杂并且冗长的，然而对于与本发明公开的内容相关的本领域的普通技术人员而言，在本公开揭露的技术内容的基础上进行的一些设计，制造或者生产等变更只是常规的技术手段，不应当理解为本发明公开的内容不充分。

除非另作定义，在本说明书和权利要求书中使用的技术术语或者科学术语应当为本发明所属技术领域内具有一般技能的人士所理解的通常意义。本说明书以及权利要求书中使用的“第一”或者“第二”以及类似的词语并不表示任何顺序、数量或者重要性，而只是用来区分不同的组成部分。“一个”或者“一”等类似词语并不表示数量限制，而是表示存在至少一个。“或者”包括所列举的项目中的任意一者或者全部。“包括”或者“包含”等类似的词语意指出现在“包括”或者“包含”前面的元件或者物件涵盖出现在“包括”或者“包含”后面列

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举的元件或者物件及其等同元件，并不排除其他元件或者物件。“连接”或者“相连”等类似的词语并非限定于物理的或者机械的连接，而是可以包括电性的连接，不管是直接的还是间接的。此外，“电路”或者“电路系统”以及“控制器”等可以包括单一组件或者由多个主动元件或者被动元件直接或者间接相连的集合，例如一个或者多个集成电路芯片，以提供所对应描述的功能。

本发明中使用的“可”、“可以”与“可能”等词语表明在某些环境中事件发生的可能性；拥有一种特定属性、特征或功能；和/或通过与某一合格动词结合表示一个或多个能力、性能或可能性。相应地，“可能”的使用表明：被修饰的术语对于所示的能力、功能或用途是明显适当、可匹配或合适的；同时考虑到在某些情况的存在，被修饰的术语有时可能不适当，不匹配或不合适。例如，在某些情况下，可能预期出现某一结果或性能；而在其他情况下，该结果或性能可能不出现。这一区别由表示“可能”的词语体现。

图 1 所示为本发明揭示的应用于动力系统中用来驱动两个负载的电驱动系统 10 的一种实施方式的概略模块示意图。该动力系统可以包括叉车系统和起重机系统。该电驱动系统 10 大致包括电能存储系统 11，电能转换系统 13，交流传动系统 15 和能量管理系统 17。在一些实施方式中，该电能转换系统 13 用于将该电能存储系统 11 产生的一种直流电能转换成另一种直流电能，该另一种直流电能被提供给该交流传动系统 15。在一些实施方式中，该电能转换系统 13 用于将该交流传动系统 15 产生的一种直流电能转换成另一种直流电能，该另一种直流电能用于给该电能存储系统 11 充电。

该能量管理系统 17 与该电能存储系统 11，该电能转换系统 13 以及该交流传动系统 15 进行通讯。在一些实施方式中，该能量管理系统 17 可用于发送电能控制信号 171，该电能控制信号 171 用于启用该电能转换系统 13，以给该交流传动系统 15 提供必要的直流电能。在一些实施方式中，该能量管理系统 17 可以用于发送电能控制信号 171，该电能控制信号 171 用于启用该电能转换系统 13，以提供必要的直流电能为该电能存储系统 11 充电。在一些实施方式中，该能量管理系统 17 可给该交流传动系统 15 发送转矩控制信号 173，该转矩控制信号 173 用于启用该交流传动系统 15，以给负载系统 31 提供必要的机械转矩。该转矩控制信号 173 至少依据输入的电驱动系统的速度 25 来产生。

在一些实施方式中，该电能存储系统 11 包括第一电能存储单元 12 和第

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二电能存储单元 14。该第一电能存储单元 12 用于提供或者接收第一电能，该第二电能存储单元 14 用于提供或者接收第二电能。在一些实施方式中，该电能存储系统 11 可包括多于两个电能存储单元。在一些实施方式中，该交流传动系统 15 包括第一交流驱动装置 20 和第二交流驱动装置 22，该第一交流驱动装置 20 用于提供或者接收第一机械转矩，该第二交流驱动装置 22 用于提供或者接收第二机械转矩。在一些实施方式中，该交流传动系统 15 可包括多于两个交流驱动装置。

该电能转换系统 13 包括电能转换装置 18。该电能转换装置 18 包括第一端口 24，第二端口 26，第三端口 28 和第四端口 30。该第一端口 24 与该第一电能存储单元 12 连接，该第二端口 26 与该第二电能存储单元 14 连接，该第三端口 28 与该第一交流驱动装置 20 连接，该第四端口 30 与该第二交流驱动装置 22 连接。在一些实施方式中，该电能转换装置 18 可包括多于四个端口。

在一些实施方式中，当该电驱动系统 10 运行在电驱动模式下时，该第一端口 24 用于接收来自该第一电能存储单元 12 产生的第一输入电能，该第二端口 26 用于接收来自该第二电能存储单元 14 产生的第二输入电能。在一些实施方式中，接收到的该第一输入电能和该第二输入电能通过该电能转换装置 18 被转换为第一输出电能和第二输出电能，该第一输出电能可以通过该第三端口 28 被提供给该第一交流驱动装置 20，该第二输出电能可以通过该第四端口 30 被提供给该第二交流驱动装置 22。

在一些实施方式中，当该电驱动系统 10 运行在制动模式或者刹车模式下，该第三端口 28 用于接收来自该第一交流驱动装置 20 产生的第一输入电能，该第四端口 30 用于接收来自该第二交流驱动装置 22 产生的第二输入电能。在一些实施方式中，接收到的该第一输入电能和该第二输入电能通过该电能转换装置 18 被转换为第一输出电能和第二输出电能，该第一输出电能可以通过该第一端口 24 和/或该第二端口 26 给该电能存储系统 11（例如第一电能存储单元 12）充电，该第二输出电能可以通过该第一端口 24 和/或该第二端口 26 给该电能存储系统 11（例如第二电能存储单元 14）充电。

在一些实施方式中，该电能转换系统 13 可包括预充电开关装置 16，该预充电开关装置 16 连接在该第一电能存储单元 12 和该第二电能存储单元 14 之间，该预充电开关装置 16 用于在该第一电能存储单元 12 和该第二电能存

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储单元 14 之间提供电能流通路径。在一些实施方式中，该电能流通路径可以是单向的，例如，该第一电能存储单元 12 可通过该单向电能流通路径为该第二电能存储单元 14 充电。在一些实施方式中，该电能流通路径也可以是双向的，例如，电能可通过该双向电能流通路径在该第一电能存储单元 12 和该第二电能存储单元 14 之间进行传输。

该负载系统 31 包括第一负载 27 和第二负载 29，该第一负载 27 与该第一交流驱动装置 20 连接，该第二负载 29 与该第二交流驱动装置 22 连接。在一些实施方式中，该第一负载 27 和该第二负载 29 可以分别用于接收来自该第一交流驱动装置 20 的第一机械转矩和来自该第二交流驱动装置 22 的第二机械转矩。在一些实施方式中，当该动力系统运行在制动模式或者刹车模式下时，该第一负载 27 和该第二负载 29 可以用于分别提供第一机械转矩，第二机械转矩给该第一交流驱动装置 20 和该第二交流驱动装置 22。然后该第一机械转矩和该第二机械转矩分别被该第一交流驱动装置 20 和该第二交流驱动装置 22 转换成电能，以给该电能存储系统 11 充电。

通过至少两个电能存储单元的结合，至少可以产生一种电能提供或者接收动作。通过合适的方式可以提高电能利用率并延长该电能存储系统的寿命。通过至少两个交流驱动装置的结合，至少可以产生一种电能转换动作。通过灵活的方式可以提高该电驱动系统的效率。

图 2 所示为本发明揭示的应用于动力系统中来驱动一个负载 23 的电驱动系统 50 的一种实施方式的概略模块示意图。该动力系统可以包括电动汽车系统和电梯系统。该电驱动系统 50 与图 1 所示的电驱动系统 10 相似，该电驱动系统 50 包括该电能存储系统 11，该电能转换系统 13，该交流传动系统 15 和该能量管理系统 17。因此，这里对于该电能存储系统 11，该电能转换系统 13，该交流传动系统 15 和该能量管理系统 17 的相同部分省略不表。

在一些实施方式中，该电驱动系统 50 包括功率分配装置 19，该功率分配装置 19 连接在该交流传动系统 15 和该负载 23 之间。

该功率分配装置 19 包括第一机械端口 32，第二机械端口 34 和第三机械端口 36。该第一机械端口 32 与该第一交流驱动装置 20 连接，该第一机械端口 32 用于接收或提供第一机械转矩；该第二机械端口 34 与该第二交流驱动装置 22 连接，该第二机械端口 34 用于接收或提供第二机械转矩；该第三机械端口 36 与负载 23 连接，该第三机械端口 36 用于提供或接收第三机械转矩。

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在一些实施方式中，该功率分配装置 19 包括一个或多个齿轮 35，该功率分配装置 19 用于将该交流传动系统 15 产生的机械转矩通过该多个齿轮 35 的传动作用提供给该负载 23。

在一些实施方式中，当该动力系统用于驱动重负载时，该第一机械端口 32 接收来自该第一交流驱动装置 20 产生的第一机械转矩，该第二机械端口 34 接收来自该第二交流驱动装置 22 产生的第二机械转矩，该第三机械端口 36 用于给该负载 23 提供第三机械转矩，该功率分配装置 19 用于将该第一机械转矩和该第二机械转矩进行结合，并输出由该第一机械转矩和该第二机械转矩结合得到的该第三机械转矩。

在一些实施方式中，当该动力系统运行于制动模式或刹车模式时，该功率分配装置 19 用于将第三机械转矩分解为第一机械转矩和第二机械转矩，该第三机械端口 36 用于接收来自该负载 23 提供的该第三机械转矩；该第一机械端口 32 用于给该第一交流驱动装置 20 提供该第一机械转矩，该第二机械端口 34 用于给该第二交流驱动装置 22 提供该第二机械转矩。该交流传动系统 15 将该第一机械转矩，该第二机械转矩转换为电功率以给该电能存储系统 11 充电。

在一些实施方式中，当该动力系统用于驱动轻负载时，该第一机械端口 32 用于接收来自该第一交流驱动装置 20 产生的第一机械转矩，该第二机械端口 34 用于给该第二交流驱动装置 22 提供第二机械转矩，该第三机械端口 36 用于给该负载 23 提供第三机械转矩，该功率分配装置 19 用于将该第一机械转矩分解为该第二机械转矩和该第三机械转矩。该第二交流驱动装置 22 将该第二机械转矩转换为电功率，以给该电能存储系统 11 充电。

在一些实施方式中，该电驱动系统 50 可包括一个可选的变速装置 21。该变速装置 21 连接在该交流驱动系统 15 和该功率分配装置 19 之间，该变速装置 21 用于将该交流传动系统 15 输出的速度与电驱动系统的速度进行匹配。

在一些实施方式中，该变速装置 21 可以连接在该第一交流驱动装置 20 和该功率分配装置 19 的第一机械端口 32 之间。在一些实施方式中，该变速装置 21 可以连接在该第二交流驱动装置 22 和该功率分配装置 19 的第二机械端口 34 之间。在一些实施方式中，当该交流传动系统 15 输出的速度可以满足该电驱动系统的速度要求时，该变速装置 21 可省略。

通过选择合适的电能存储单元，合适的交流驱动装置以及在电能存储单

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元和交流驱动装置之间合适的连接方式可以减小电驱动系统的重量、体积和成本。

在一些实施方式中，该电能存储系统 11 可能包括两个蓄电池，该两个蓄电池分别用作该第一电能存储单元 12 和该第二电能存储单元 14。在一些实施方式中，该电能存储系统 11 可能包括蓄电池和超级电容器，该蓄电池和超级电容器分别用作该第一电能存储单元 12 和该第二电能存储单元 14。在一些实施方式中，该电能存储系统 11 可能包括其他种类的电池，例如飞轮储能电池。

在一些实施方式中，该交流传动系统 15 可能包括两个感应电机，该两个感应电机分别用作该第一交流驱动装置 20 和该第二交流驱动装置 22。在一些实施方式中，该交流传动系统 15 可能包括感应电机和永磁电机，该感应电机和该永磁电机分别用作该第一交流驱动装置 20 和该第二交流驱动装置 22。在一些实施方式中，该交流传动系统 15 可能包括其他种类的电机，例如开关磁阻电机。

图 3 所示为本发明揭示的应用于电动汽车系统中的电驱动系统 100 的一种实施方式的概略模块示意图。该电驱动系统 100 大致包括电能存储系统 102，电能转换系统 104，交流传动系统 106，能量管理系统 208，功率分配装置 122 和变速装置 119。

在一些实施方式中，该电能存储系统 102 包括蓄电池 101 和超级电容器 103。该交流传动系统 106 包括第一交流驱动装置 116 和第二交流驱动装置 118。该第一交流驱动装置 116 包括第一直流/交流逆变器 111 和感应电机 115。该第二交流驱动装置 118 包括第二直流/交流逆变器 113 和永磁电机 117。在一些实施方式中，单独的电能转换装置 107 用作如图 1 所详细描述的该电能转换装置 18。

电驱动系统 100 可包括多条电能流通路径。在一些实施方式中，启用该蓄电池 101 并通过该电能转换系统 104 来转换电能，该电能转换系统 104 将转换的电能提供给该感应电机 115 和该永磁电机 117 中至少一个电机，以此至少形成第一电能流通路径。在一些实施方式中，启用该超级电容器 103 并通过该电能转换系统 104 来转换电能，该电能转换系统 104 将转换的电能提供给该感应电机 115 和该永磁电机 117 中至少一个电机，以此至少形成第二电能流通路径。

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在一些实施方式中，由该感应电机 115 和该永磁电机 117 中至少一个电机产生的机械转矩首先被转换为电能，然后该电能可以通过该电能转换系统 104 用于给该蓄电池 101 和该超级电容器 103 中至少一个进行充电，以此至少形成第三电能流通路径。在一些实施方式中，该蓄电池 101 产生的电能可以通过预充电开关装置 105 给该超级电容器 103 充电，以此至少形成第四电能流通路径。

一种灵活的充电策略可用于给该蓄电池 101 和该超级电容器 103 中至少一个进行充电。例如，在一些实施方式中，该感应电机 115 产生的电能可通过该单独的电能转换装置 107 给该超级电容器 103 充电。这种实施方式不同于之前利用该预充电开关装置 105 给该超级电容器 103 充电的方式。在一些实施方式中，该能量管理系统 108 可以用于实施一种解耦算法来实现对该感应电机 115 和该永磁电机 117 的独立控制。

图 4 所示为本发明揭示的应用于电动汽车系统中的电驱动系统 200 的一种实施方式的概略模块示意图。在该电驱动系统 200 中，电能转换系统 204 包括第一电能转换装置 207 与第二电能转换装置 209，该第一电能转换装置 207 与该第二电能转换装置 209 并联连接。在一些实施方式中，该功率分配装置 121 可包括一个或多个行星齿轮组 37，该功率分配装置 121 用于将该交流传动系统 106 产生的机械转矩通过该一个或者多个行星齿轮组 37 的传动作用提供给负载 123。

在一些实施方式中，该第一电能转换装置 207 包括第一端口 231 和第三端口 235。该第二电转换装置 209 包括第二端口 233 和第四端口 237。在其他实施方式中，该第一电能转换装置 207 提供的端口也可以多于两个，该第二电转换装置 209 提供的端口也可以多于两个。

在一些实施方式中，该感应电机 115 产生的电能可直接通过该电能转换系统 204 和该预充电开关装置 105 给该超级电容器 103 充电。同时，该永磁电机 117 产生的电能可直接通过该电能转换系统 204 给该超级电容器 103 充电。

对该第一电能转换装置 207 和该第二电能转换装置 209 的独立控制可在该第三端口 235 和该第四端口 237 得到不同的直流电压，因此可以实现对该感应电机 115 和该永磁电机 117 的解耦控制。

该电驱动系统 200 中包括多条用于给该超级电容器 103 充电的电能流通

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路径。在一些实施方式中，该蓄电池 101 可以通过该预充电开关装置 105 给该超级电容器 103 充电。在一些实施方式中，该感应电机 115 可通过该第一电能转换装置 207 和该预充电开关装置 105 给该超级电容器 103 充电。在一些实施方式中，该永磁电机 117 可通过该第二电能转换装置 209 给该超级电容器 103 充电。在一些实施方式中，至少该感应电机 115 产生的部分机械转矩可以通过该永磁电机 117 被转换为电功率，该电功率再通过该第二电转换装置 209 给该超级电容器 103 充电。

图 5 所示为本发明揭示的应用于电动汽车系统中的电驱动系统 300 的一种实施方式的概略模块示意图。在该电驱动系统 300 中，电能转换系统 304 包括第一电能转换装置 307 与第二电能转换装置 309，该第一电能转换装置 307 与该第二电能转换装置 309 并联连接。

该第一电能转换装置 307 包括第一端口 331，第二端口 333，第三端口 335。在一些实施方式中，该第三端口 335 与该第二交流驱动装置 118 和该第二电能转换装置 309 连接。该第二电能转换装置 309 包括输入端口 337 和输出端口 339，该输入端口 337 与该第一电能转换装置 307 的第三端口 335 连接，该输出端口 339 与该第一交流驱动装置 116 连接。在一些实施方式中，类似于如图 3 所示对该电驱动系统 10 所作的描述，该电驱动系统 300 中可灵活的包括多条电能流通路径。

对该第一电转换装置 307 和该第二电能转换装置 309 的独立控制可在该第三端口 335 和该输出端口 339 得到不同的直流电压，因此可以实现对该感应电机 115 和该永磁电机 117 的解耦控制。

在一些实施方式中，该第二电能转换装置 309 与该第二交流驱动装置 118 连接。在一些实施方式中，该电能转换系统 304 可以包括更多电能转换装置和灵活的连接方式。

图 6 所示为能量管理方法的一种实施方式的流程图。该能量管理方法 600 可以编程为程序指令或者计算机软件，并保存在可以被电脑或者处理器读取的存储介质上。当该程序指令被电脑或者处理器执行时，可以实现如流程图所示的各个步骤。可以理解，电脑可读的介质可以包括易失性的和非易失性的，以任何方法或者技术实现的可移动的以及非可移动的介质。更具体言之，电脑可读的介质包括但不限于随机访问存储器，只读存储器，电可擦只读存储器，闪存存储器，或者其他技术的存储器，光盘只读存储器，数字化光盘

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存储器，或者其他形式的光学存储器，磁带盒，磁带，磁碟，或者其他形式的磁性存储器，以及任何其他形式的可以用于存储能被指令执行系统访问的预定信息的存储介质。

在一些实施方式中，该能量管理方法 600 可以从步骤 601 开始执行。在步骤 601 中，接收测量到的电驱动系统的速度信号V_{speed}。然后流程转向步骤 603，在步骤 603 中，在一些实施方式中，需求功率信号P_{req}可通过总转矩需求信号T_{total}和电驱动系统的速度信号V_{speed}计算得到。然后流程转向步骤 605。

在步骤 605 中，该能量管理方法 600 执行判断步骤，根据动力系统工作模式来确定是否该第一交流驱动装置 20 和该第二交流驱动装置 22 都被启用，该系统工作模式至少根据该电驱动系统的速度信号V_{speed}来确定。在一些实施方式中，动力系统可以工作在正常模式，该正常模式包括启动模式，加速模式，巡航模式，制动模式。在一些实施方式中，该动力系统可以工作在容错模式，该容错模式可通过测量到的电压或者电流信号来判断。

在一些实施方式中，被启用的交流驱动装置和该被启用交流驱动装置中的交流电机的工作方式可根据该工作模式或者该需求功率信号P_{req}来决定，该交流电机的工作方式可包括发电机和电动机。如果该第一交流驱动装置 20 和该第二交流驱动装置 22 都被启用，该能量管理方法 600 转向步骤 607 执行，否则，该能量管理方法 600 转向步骤 609。

在步骤 607 中，优化算法可在转矩分配单元中实施，该转矩分配单元用于将该总转矩需求信号T_{total}分配为第一转矩控制信号和第二转矩控制信号。该第一转矩控制信号被提供给该第一交流驱动装置 20，该第二转矩控制信号被提供给该第二交流驱动装置 22。然后流程转向步骤 609。

在步骤 609 中，根据该被启用的交流驱动装置和该电能转换系统 13 的结构，启用该第一电能存储单元 12 和该第二电能存储单元 14 至少一个单元。在一些实施方式中，被启用电能存储单元的工作方式可根据该需求功率信号P_{req}来决定，该被启用电能存储单元的工作方式可包括充电和放电。

在一些实施方式中，决定该被启用电能存储单元的原则是该第一电能存储单元 12 用作主要电源，该第二电能存储单元 14 用作辅助电源。在一些实施方式中，该第一电能存储单元 12 用于给该第一交流驱动装置 20 提供电能，该第二电能存储单元 14 用于给该第二交流驱动装置 22 提供电能。

在一些实施方式中，由于受到充/放电特性限制，当该第一电能存储单元

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12 不足以快速地提供该需求功率信号P_{req}时，由该第二电能存储单元 14 提供额外所需功率。在一些实施方式中，当该第二电能存储单元 14 不足以提供该额外所需功率时，仍旧由该第一电能存储单元 12 供所需功率。

在一些实施方式中，当该动力系统工作在制动模式或刹车模式时，该第一交流驱动装置 20 和该第二交流驱动装置 22 提供的部分电能可用于给第二电能存储单元 14 充电。然后流程转向步骤 611。

在步骤 611 中，根据该启用的交流驱动装置和该启用的电能存储单元及其工作方式决定电能控制信号 171。该电能控制信号 171 可通过如下所述过程得到。

该电能存储系统 11 产生的电能被提供给该交流传动系统 15。在一些实施方式中，该第一端口 24 接收的第一输入功率可以被转换为第一输出功率和第二输出功率，该第一输出功率和该第二输出功率分别通过该第三端口 28 和该第四端口 30 输出。在一些实施方式中，该第二端口 26 接收的第二输入功率可以被转换为第一输出功率和第二输出功率，该第一输出功率和该第二输出功率分别通过该第三端口 28 和该第四端口 30 输出。然后，根据该被启用交流驱动装置，该第三端口 28 和该第四端口 30 接收的电能被选择性地提供给该交流传动系统 15。

该交流传动系统 15 产生的电能用于给该电能存储系统 11 充电。在一些实施方式中，当该第一交流驱动装置 20 中的第一交流电机用作发电机时，该第一交流驱动装置 20 产生的电能可用于给该电能存储系统 11 充电。在该充电过程中，该电能可以直接通过该电能转换装置 18 或者间接再通过该预充电开关装置 16 给该第二电能存储单元 14 充电。

在一些实施方式中，当该第二交流驱动装置 22 中的第二交流电机用作发电机时，该第二交流驱动装置 22 产生的电能可用于给该电能存储系统 11 充电。在该充电过程中，该电能可以直接通过该电能转换装置 18 给该电能存储系统 11 充电。

在一些实施方式中，当该第一交流驱动装置 20 中的第一交流电机用作电动机，该第二交流驱动装置 22 中的第二交流电机用作发电机时，该第一交流驱动装置 20 产生的机械转矩可通过该功率分配装置 19 被分解为第一机械转矩和第二机械转矩。该第一机械转矩被提供给负载 23，该第二机械转矩通过该第二交流驱动装置 22 被转换为电能，该电能通过该电能转换装置 18 给第

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二电能存储单元 14 充电。

在一些实施方式中，该第一电能存储单元 12 产生的功率可以通过该预充电开关装置 16 给该第二电能存储单元 14 充电。通过以上能量流动过程分析可得到电能控制信号 171。然后流程转向步骤 613。

在步骤 613 中，该电能控制信号 171 将被提供给电能转换系统 13，该电能控制信号 171 用于控制电能在该电能存储系统 11，该电能转换系统 13 和该交流传动系统 15 中的流动。然后流程转向步骤 615。

在步骤 615 中，转矩控制信号 173 用于控制该交流传动系统 15 输出期望转矩，该期望转矩用于驱动该负载 23。

如上所述的方法 600 可包括多种改进方式。在一些实施方式中，在步骤 601 之前可包括额外步骤，在该额外步骤中，根据第二电能存储单元 14 的电流、电压或决定是否需要进行预充电过程。在一些实施方式中，当第二电能存储单元的功率信号小于预先设定的阈值时，该预充电过程被启用，否则，该预充电过程不被启用。

在一些实施方式中，该预充电过程在该动力系统被使能之前进行初始化。该预充电过程包括将该第一电能存储单元 12 的电能通过该预充电开关装置 16 给该第二电能存储单元 14 充电。以便保证当有需要时，该第二电能存储单元 14 可快速地提供充足的能量。然后流程转向步骤 601。

图 7 所示为图 6 中决定是否该第一交流驱动装置 20 和该第二交流驱动装置 22 均被启用的步骤的具体方法流程图，该方法 700 在本发明中应用于电动汽车系统中。该方法 700 的具体细节描述是结合如图 3 所示的电驱动系统。然而本领域的技术人员可将该方法 700 应用于其他动力系统中。

在一些实施方式中，该方法 700 可以从步骤 701 开始，如果该电动汽车系统不能正常运行，至少测量到的电流或者电压信号超出正常值，则该电动汽车系统工作在如步骤 705 所显示的容错模式。否则，该电动汽车系统工作在如步骤 703 所显示的正常模式。

当该电动汽车系统工作在容错模式时，至少该蓄电池 101，该超级电容器 103，该感应电机 115 和该永磁电机 117 当中一个出现问题。其余正常的部分可以被重构形成精简的电驱动系统结构。

在一些实施方式中，该蓄电池 101 和该超级电容器 103 当中一个，该感应电机 115，和该永磁电机 117 被重构。在一些实施方式中，该蓄电池 101，

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该超级电容器 103，和该感应电机 115 和该永磁电机 117 当中一个被重构。在一些实施方式中，该蓄电池 101 和该超级电容器 103 当中一个，和该感应电机 115 和该永磁电机 117 当中一个被重构。通过这种重构方式，在该容错模式下，该电动汽车系统可以安全的停车。该方法可调高该电动汽车系统的容错能力和可靠性。

当该电动汽车系统工作在正常模式时，在步骤 707 中，接收汽车速度信号V_{speed}。在步骤 709 中，通过V_{speed}和T_{total}来计算P_{req}。然后流程选择性地转向四条支路 702，704，706 和 708。该四条支路决定被启用的交流电机和该被启用交流电机的工作方式。其中，属性值{1}用于表示该感应电机 115 被启用，属性值{2}用于表示该永磁电机 117 被启用，属性值{1，2}用于表示该感应电机 115 和该永磁电机 117 被启用。

在该支路 702 中，当V_{speed}从 0 开始增加时，该电动汽车系统工作在如步骤 711 所示的启动模式。该流程转向步骤 719，在步骤 719 中，决定该永磁电机 117 是否能够提供P_{req}，如果能，该流程转向步骤 723，在该步骤 723 中，该永磁电机 117 被启用作为电动机，该永磁电机 117 用于提供必要的机械转矩来达到P_{req}的要求。如果不能，该流程转向步骤 725，在该步骤 725 中，该感应电机 115 被启用作为电动机，该感应电机 115 用于提供必要的机械转矩来达到P_{req}的要求。

在该支路 704 中，当V_{speed}在一段时间内保持突升时，该电动汽车系统工作在如步骤 713 所示的加速模式。该流程转向步骤 727，在步骤 727 中，该感应电机 115 和该永磁电机 117 被启用作为电动机，该感应电机 115 和该永磁电机 117 用于提供必要的机械转矩来达到P_{req}的要求。

在该支路 706 中，当V_{speed}在一段时间内在保持小范围波动时，该电动汽车系统工作在如步骤 715 所示的巡航模式。该流程转向步骤 729，在步骤 729 中，至少该感应电机 115 和该永磁电机 117 当中一个被启用作为电动机，至少该感应电机 115 和该永磁电机 117 当中一个用于提供必要的机械转矩来达到P_{req}的要求。

在该支路 708 中，当V_{speed}在一段时间内保持突降时，该电动汽车系统工作在如步骤 717 所示制动模式。该流程转向步骤 731，在步骤 731 中，该感应电机 115 和该永磁电机 117 被启用作为发电机。

图 8 所示为图 6 中决定通过转矩分配单元计算两个转矩控制信号该步骤

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的具体方法流程图。在步骤 801 中，接收到至少该总转矩需求信号T_{total}。该流程转向步骤 803，在步骤 803 中，接收测量到的该第一交流电机和该第二交流电机的转矩信号$M_{torque1}$，$M_{torque2}$。该流程转向步骤 805，在步骤 805 中，接收测量到的该第一交流电机和该第二交流电机的转速M_{speed1}，M_{speed2}。该流程转向步骤 807。

在步骤 807 中，通过该转矩分配单元计算得到该第一转矩控制信号$T_{torque1}$和该第二转矩控制信号$T_{torque2}$。该转矩分配单元可通过该能量管理系统 17 以软件的形式实现。在一些实施方式中，T_{total}可以由至少该第一交流电机 115 和该第二交流电机 117 当中一个来提供。

在一些实施方式中，根据如图 9 所示该第一交流电机 115 和该第二交流电机 117 的转矩提供能力曲线 901、905，$T_{torque1}$和$T_{torque2}$可通过固定比例分配算法计算得到。若该第一交流电机 115 和该第二交流电机 117 其中一个不足以提供T_{total}，另外一个交流电机根据以下计算式来提供额外转矩：

$$a\,T_{torque1} = T_{total}\ (0 \le a \le 1) \quad (1),$$

$$b\,T_{torque2} = T_{total}\ (0 \le b \le 1) \quad (2),$$

$$a + b = 1 \quad (3),$$

其中a和b是两个变量，在一些实施方式中，a和b可能包括一组固定值。如当a＝1，b＝0时，该第一交流电机 115 用于独自提供T_{total}。当a＝0，b＝1时，该第二交流电机 117 用于独自提供T_{total}。在一些实施方式中，a和b可能包括多组固定值，从而可以实现优化的转矩分配方法。

在一些实施方式中，T_{total}可能被分配为平均转矩$T_{average}$和峰值转矩T_{peak}。$T_{torque1}$和$T_{torque2}$分别等于$T_{average}$和T_{peak}。例如，当动力系统突然加速时，希望该第一交流电机 115 和该第二交流电机 117 其中一个可以提供快速平稳的峰值功率。

如图 9 所示，该第一交流电机 115 能够在窄速度范围内提供一个大转矩，该第二交流电机 117 可以在宽速度范围内快速提供一个小转矩。在一些实施方式中，该第二交流电机 117 用于辅助该第一交流电机 115。具体算法如以下计算式所示：

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$$T_{total} = T_{average} + T_{peak} \quad (4),$$

$$T_{torque1} = T_{average} \quad (5),$$

$$T_{torque2} = T_{peak} \quad (6),$$

在一些实施方式中，根据如图 9 所示该第一交流电机 115 和该第二交流电机 117 的高效工作区 903、907，$T_{torque1}$和$T_{torque2}$可以通过一种算法实现该交流传动系统 106 效率的最大化，以实现该第一交流电机 115 和该第二交流电机 117 都可以工作在各自的高效工作区。在一些实施方式中，工作点的改变可通过改变该交流电机的转速来实现，该转速可通过该传输装置 21 来改变。如图 9 所示，该第一交流电机的工作点可在曲线 913 和 915 之间左右移动。

在一些实施方式中，当M_{speed1}和M_{speed2}是固定值时，该第一交流电机 115 和该第二交流电机 117 的工作点可以分别沿着曲线 909 和曲线 911 在各自的高效工作区 903、907 的范围内移动。该算法可以通过如下计算式实现:

$$T_{torque1} + T_{torque2} = T_{total} \quad (7),$$

$$P_{loss1} + P_{loss2} = min \quad (8)。$$

其中，P_{loss1}和P_{loss2}分别为该第一交流电机 115 和该第二交流电机 117 的功率损耗。该转矩分配算法根据该第一驱动装置 20 和该第二驱动装置 22 中的第一交流电机 115 和第二交流电机 117 的效率曲线图制定出一个查询表格，该查询表格定义了该第一交流电机 115 和该第二交流电机 117 运行的高效率区域。该转矩分配算法可以降低该交流传动系统 15 的损耗。

图 10 所示为图 6 中至少该第一电能存储单元 12 和该第二电能存储单元 14 当中一个被启用该步骤的具体方法流程图。其中，P_{req}表示需求功率，P_{bat}表示提供给蓄电池 101 的功率，P_{uc}表示提供给超级电容器 103 的功率，$P_{bat(threshold)}$表示该蓄电池 101 能够提供的上限功率，$P_{uc(threshold)}$表示该超级电容器 103 能够提供的上限功率，$P_{uc(charging)}$表示该超级电容器 103 所需的充电功率。

在步骤 1001 中，接收到P_{req}和该电机的属性值。然后该流程转向步骤 1003，在步骤 1003 中，执行判断操作，以决定该流程的转向。在一些实施方式中，

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当接收到属性值{1}或者属性值{1,2}时，该流程转向步骤 1005，否则，当接收到属性值{2}时，该流程转向步骤 1007。

在步骤 1005 中，如果P_{req}大于P_{bat}，该流程转向步骤 1009，否则，该流程转向步骤 1011，在步骤 1011 中，该蓄电池 101 提供电能。在步骤 1009 中，如果$P_{uc(threshold)}$大于P_{req}与$P_{bat(threshold)}$的差值，该流程转向步骤 1013，在步骤 1013 中，该蓄电池 101 提供本身能提供的上限功率，该超级电容器提供额外的功率。

在步骤 1007 中，如果P_{req}大于$P_{uc(threshold)}$，该流程转向步骤 1017，否则该流程转向步骤 1019，在步骤 1019 中，该超级电容器 103 提供功率。在步骤 1017 中，如果该超级电容器 103 需要被充电，该流程转向步骤 1021，在步骤 1021 中，该超级电容器接收到所需的充电功率$P_{uc(charging)}$，该蓄电池 101 提供需求功率P_{req}和所需的充电功率$P_{uc(charging)}$。否则，该流程转向步骤 1023，在步骤 1023 中，该超级电容器 103 提供本身能提供的上限功率，该蓄电池提供额外的功率。

虽然结合特定的实施方式对本发明进行了说明，但本领域的技术人员可以理解，对本发明可以作出许多修改和变型。因此，要认识到，权利要求书的意图在于涵盖在本发明真正构思和范围内的所有这些修改和变型。

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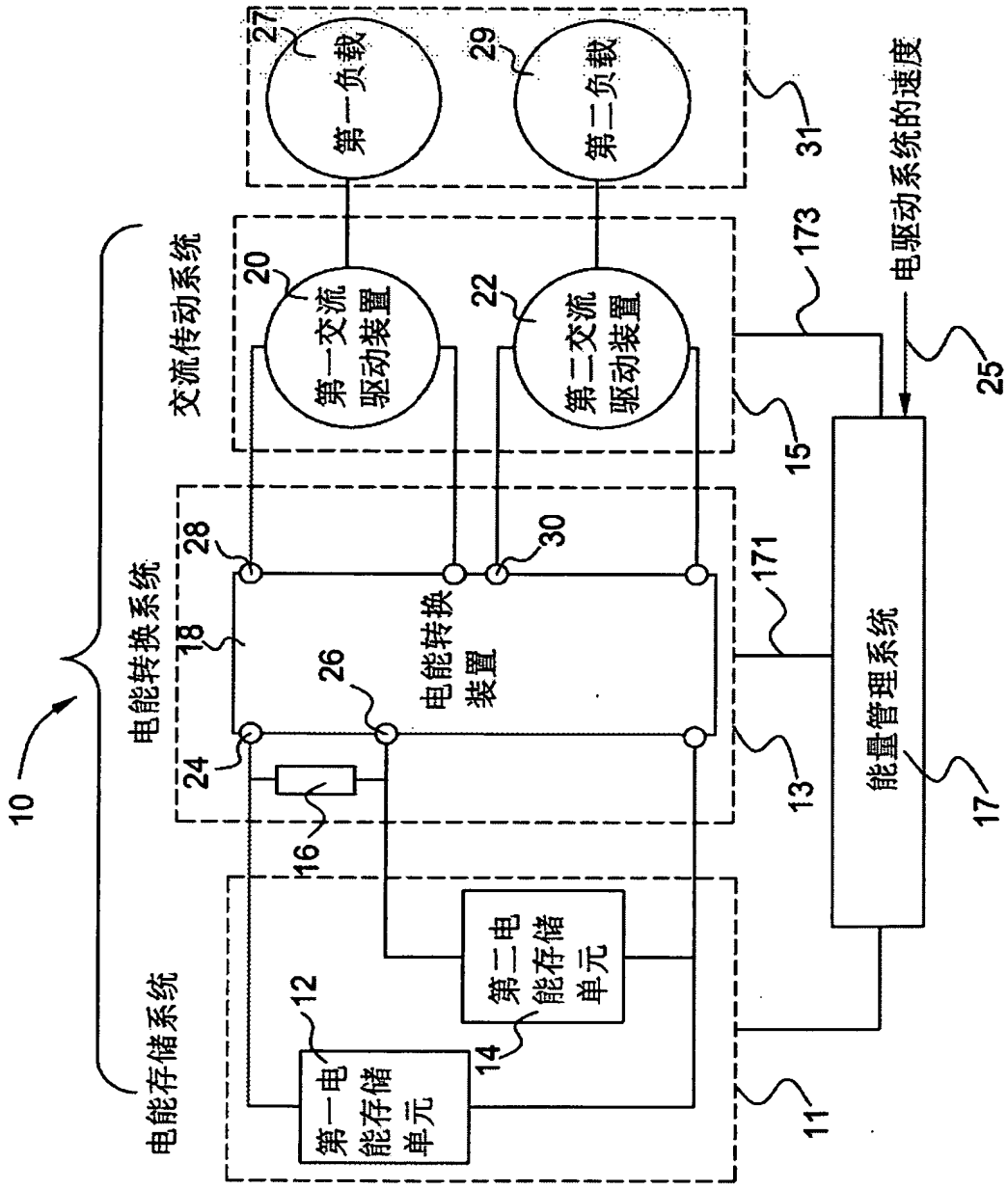


图 1

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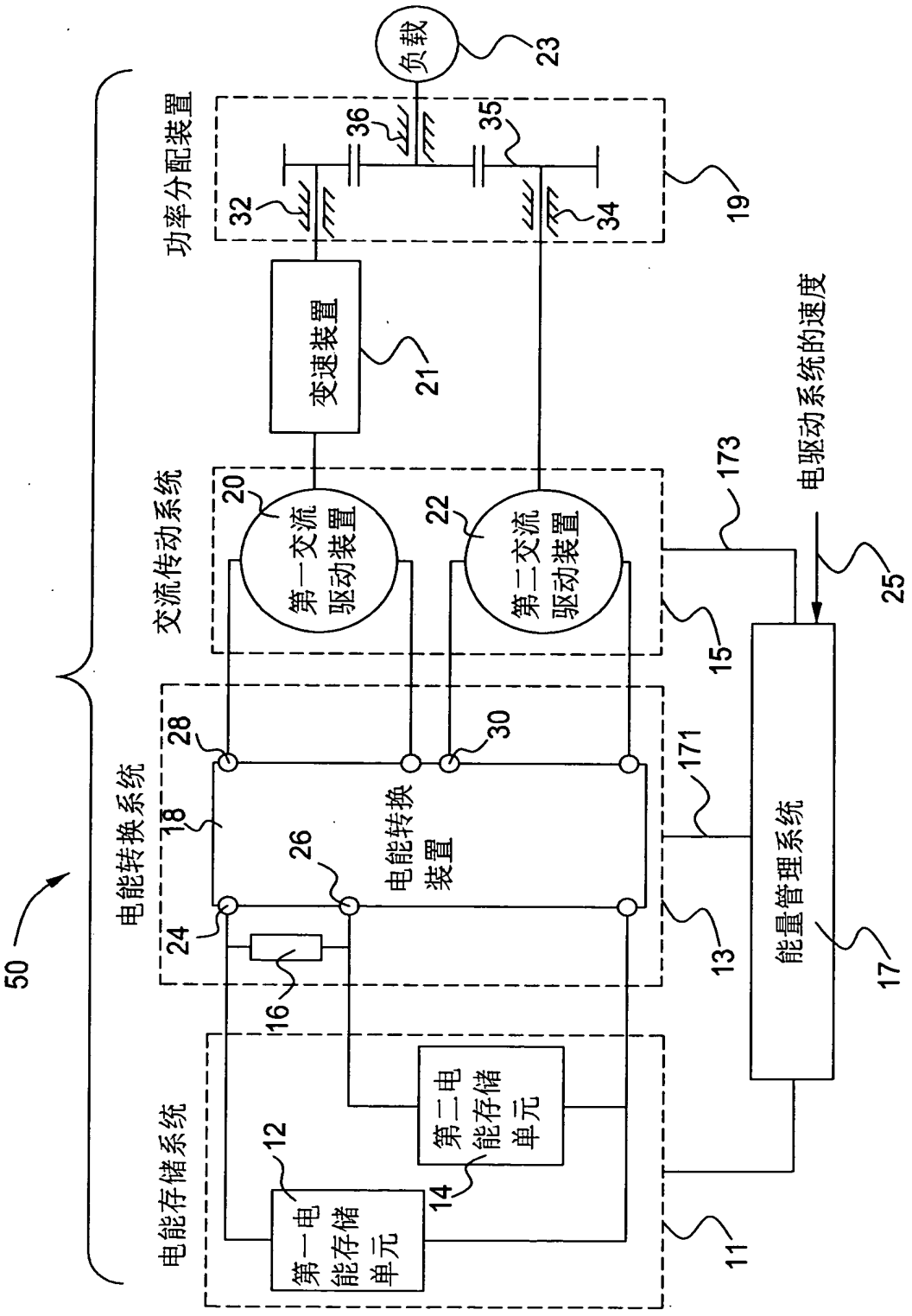


图 2

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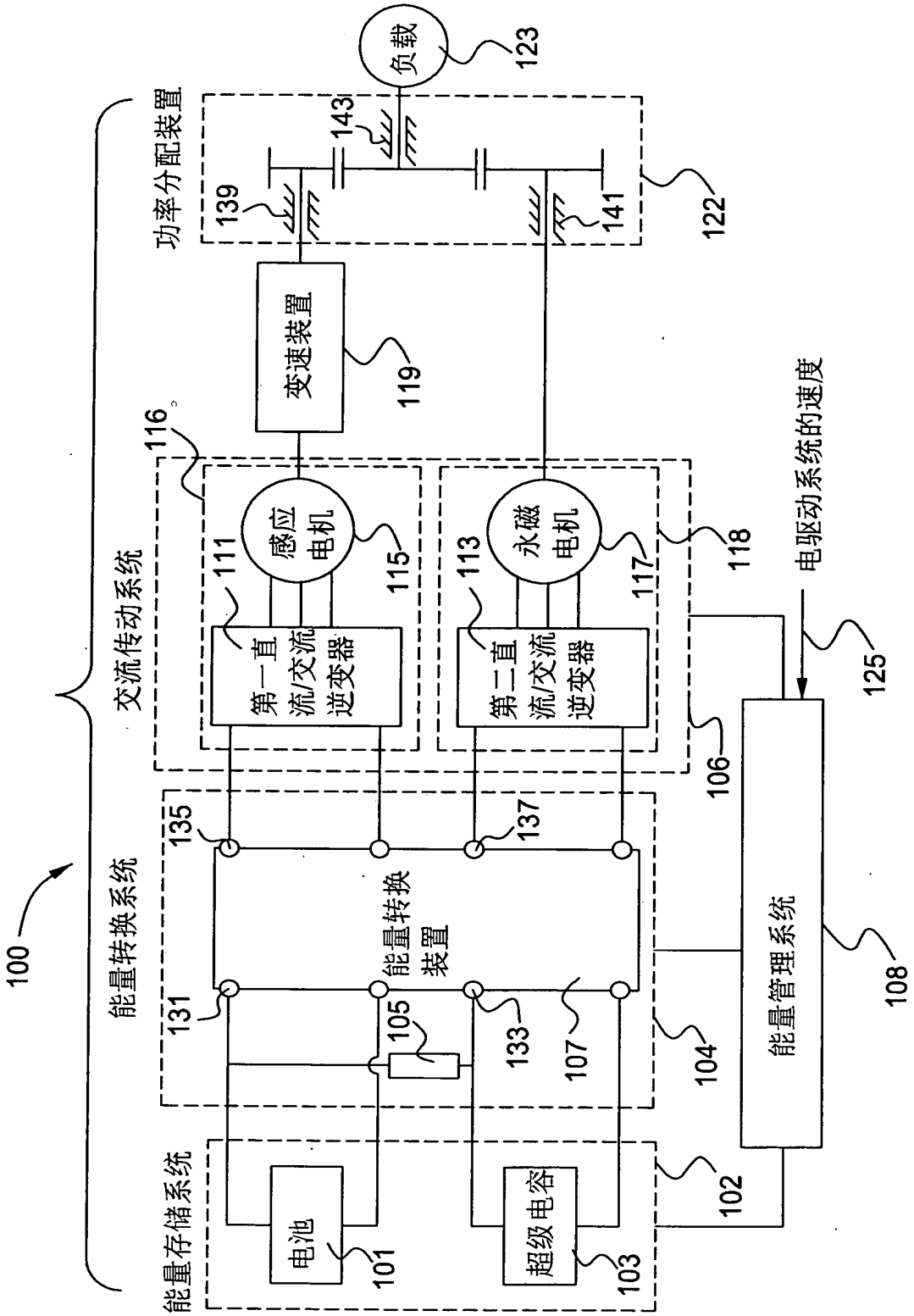


图 3

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2012105094932

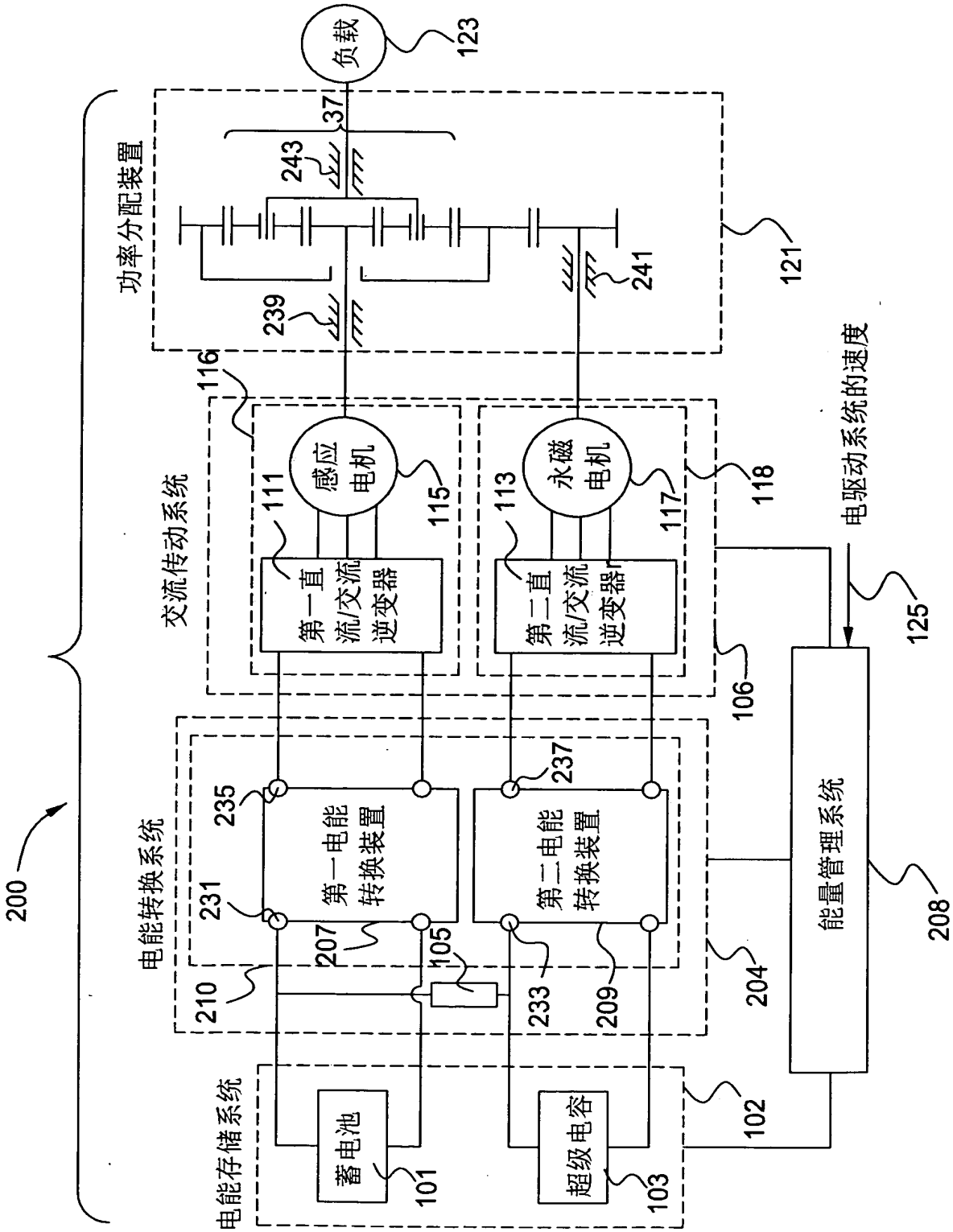


图 4

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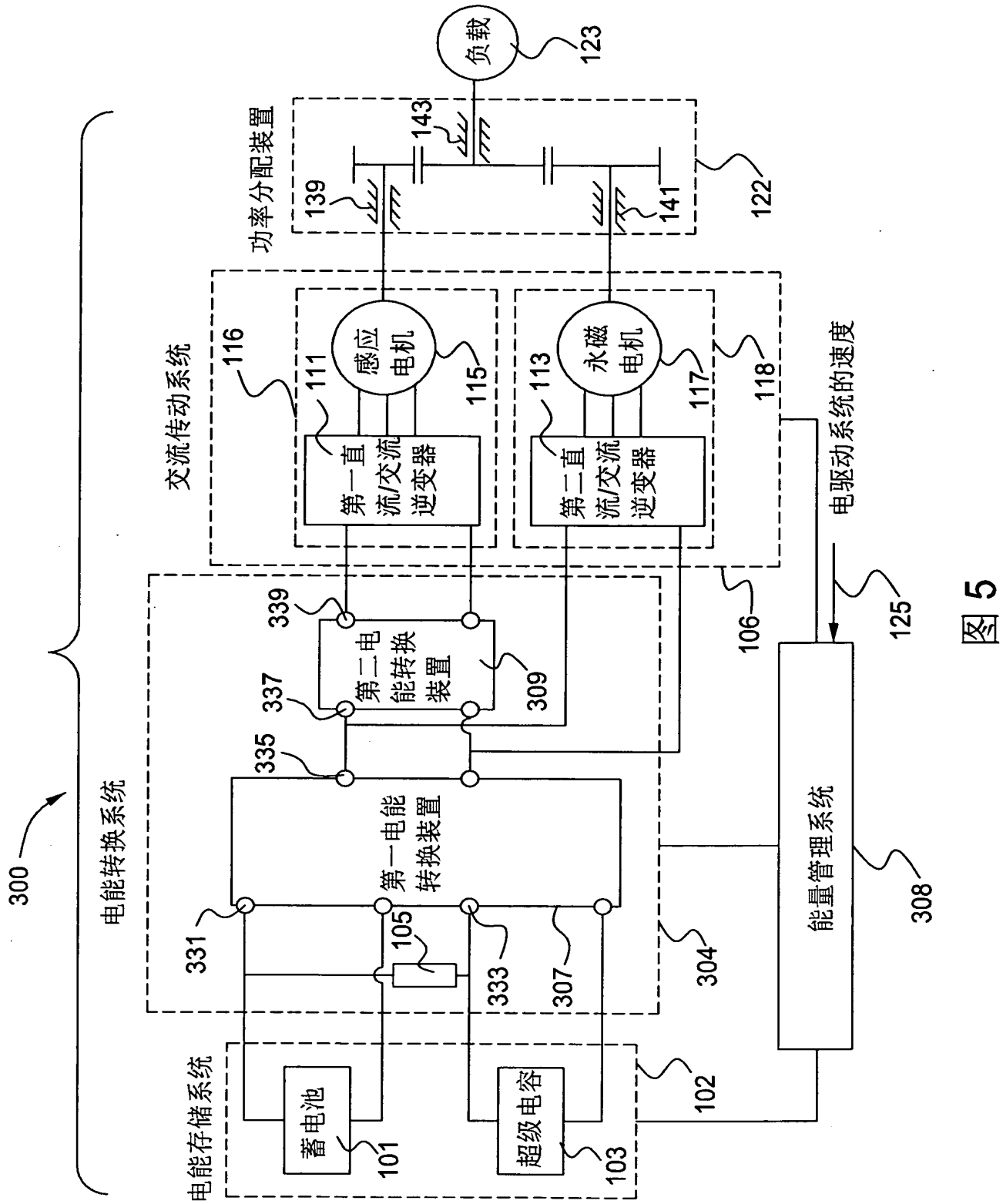


图 5

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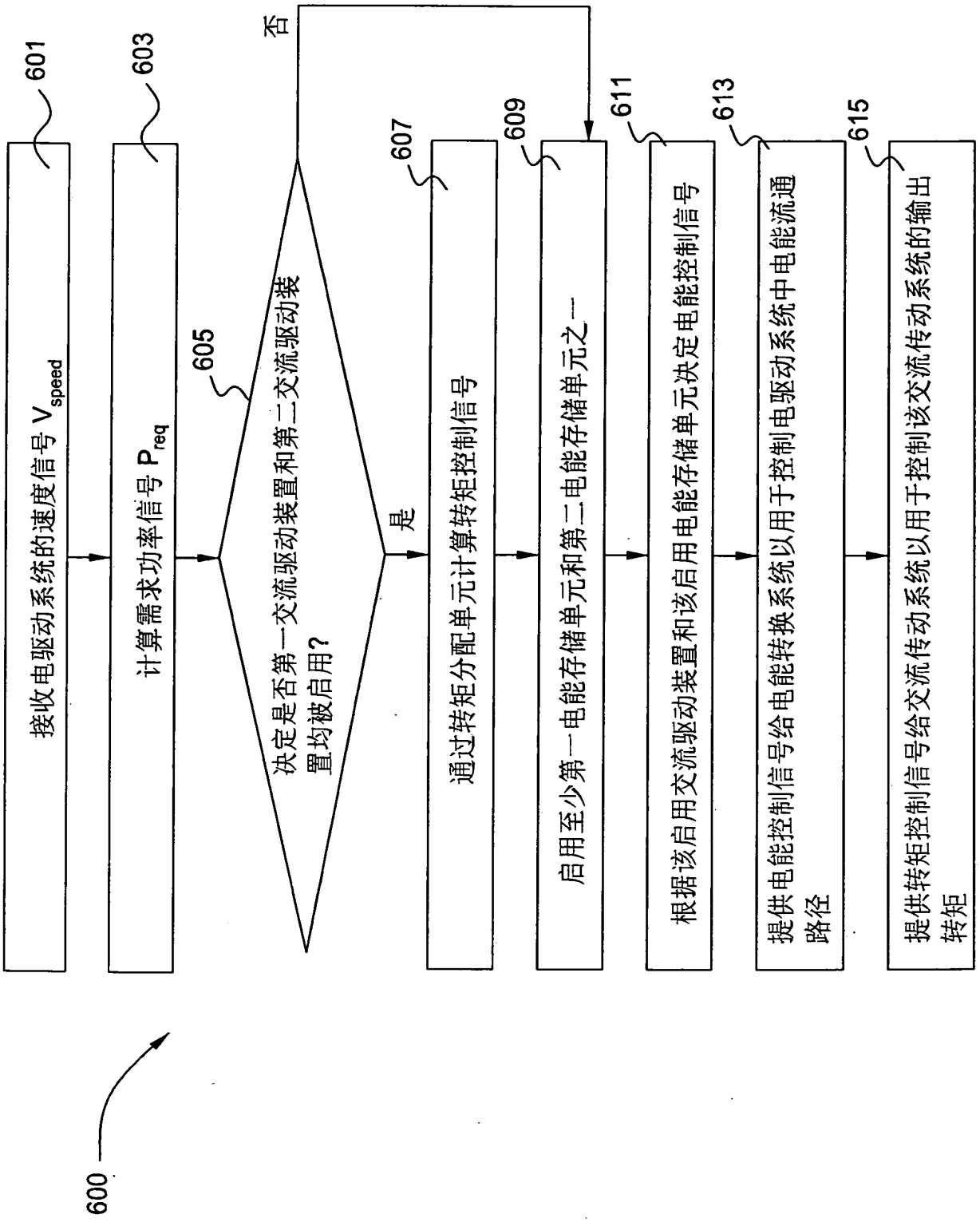


图 6

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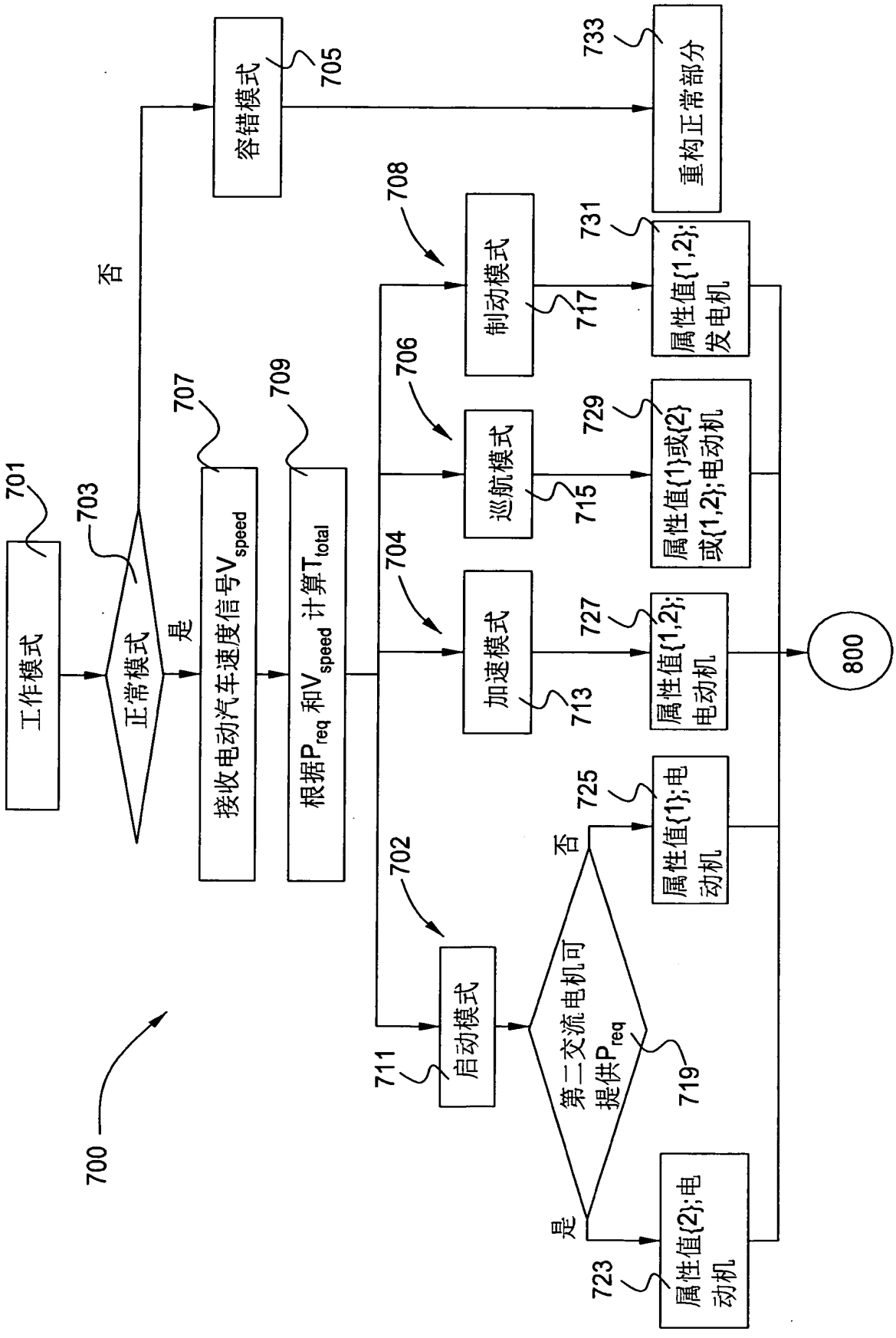


图 7

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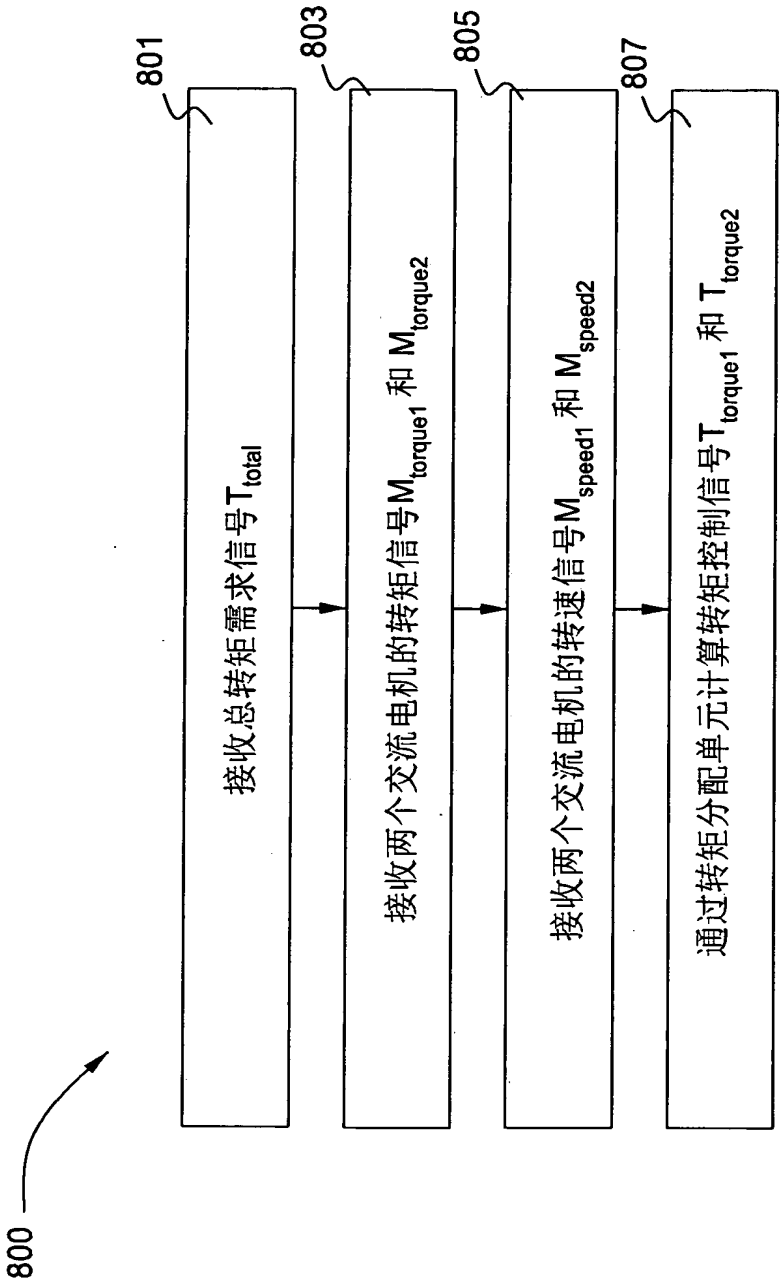


图 8

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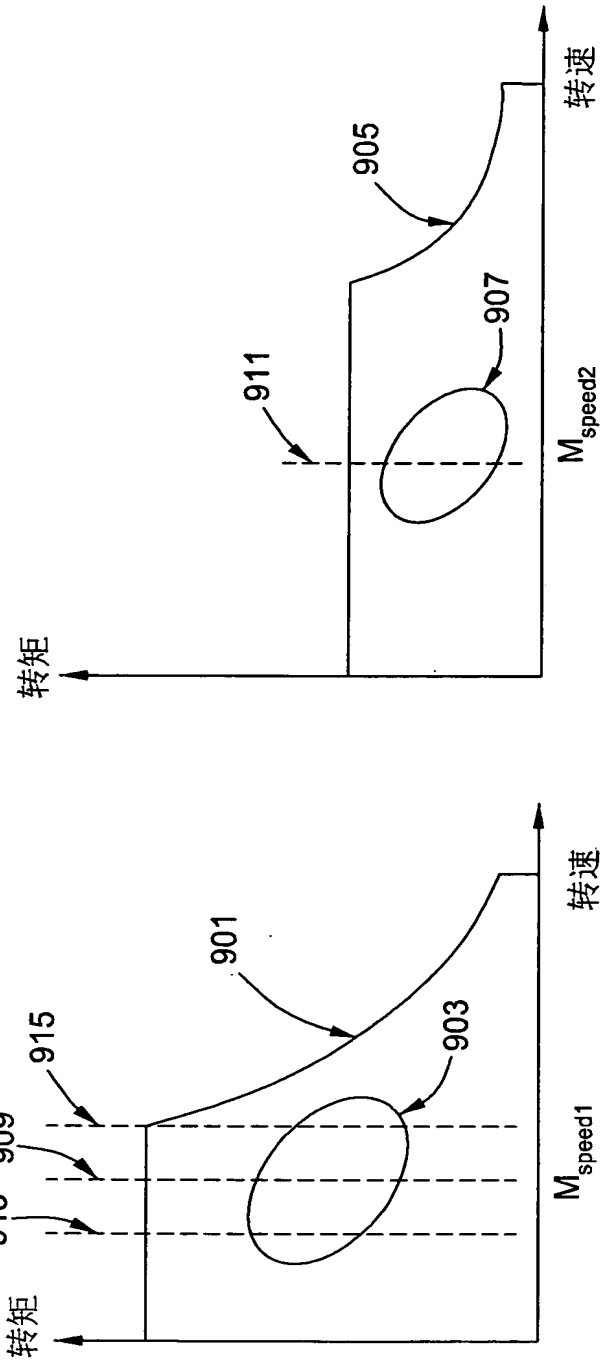


图 9

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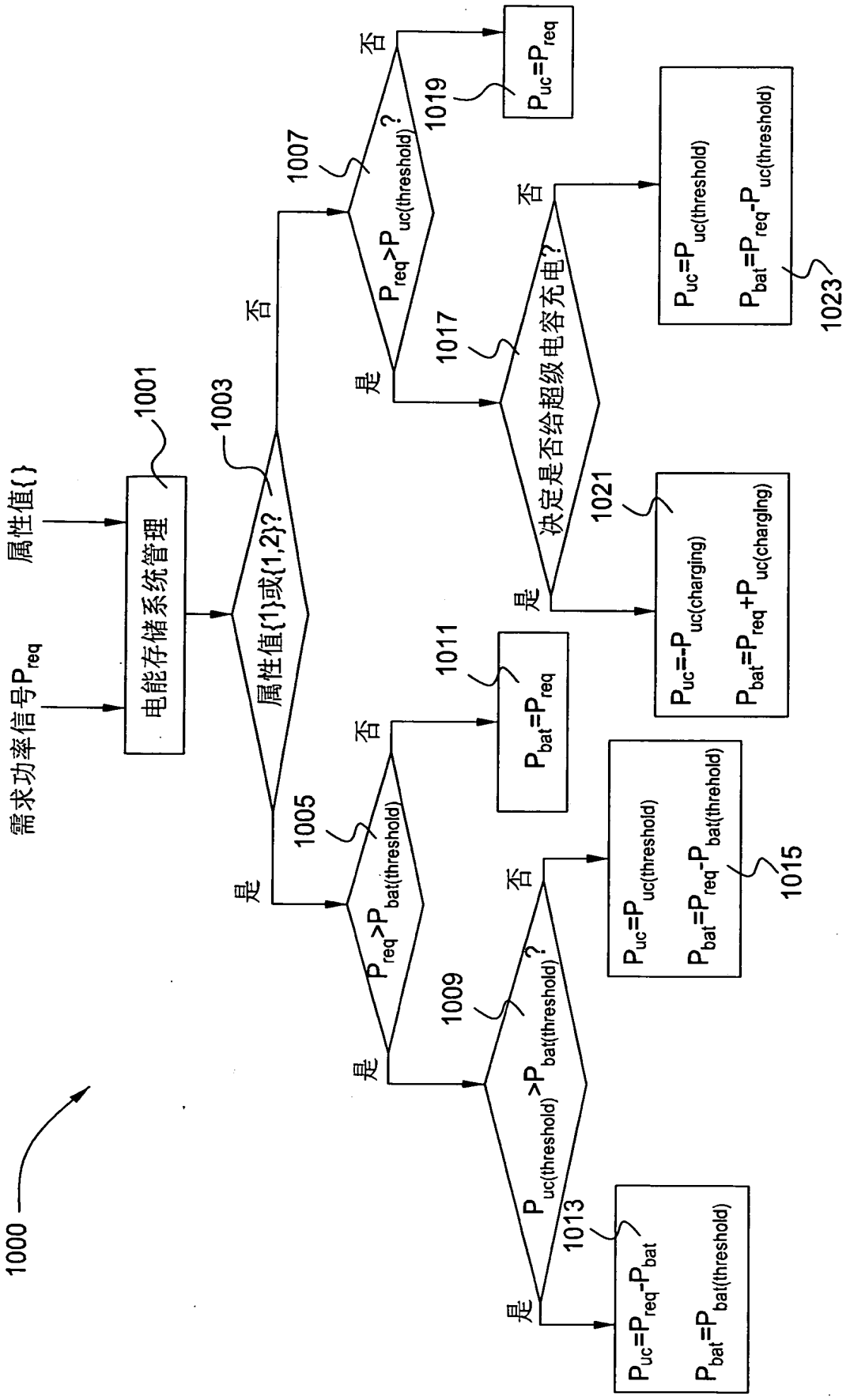


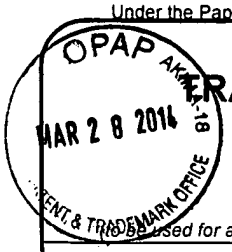
图 10

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Examiner Name	COLON SANTANA, EDUARDO
Attorney Docket Number	256975-2

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  - ☐ Fee Attached
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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82A (07-12)

Approved for use through 11/30/2014. OMB 0651-0035

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B or equivalent) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5. If the Power of Attorney by Applicant form is not accompanied by this transmittal form or an equivalent, the Power of Attorney will not be recognized in the application.

Application Number	14/094086
Filing Date	December 2, 2013
First Named Inventor	Jian Zhou
Title	Electric Drive System and Energy Management Method
Art Unit	
Examiner Name	
Attorney Docket Number	256975

SIGNATURE of Applicant or Patent Practitioner

Signature	/ptd47323/	Date	
Name	Peter T. DiMauro	Telephone	203-944-6711
Registration Number	47323		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc Code: PA..

Document Description: Power of Attorney

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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in the attached transmittal letter.

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

52082

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

Name	Registration Number	Name	Registration Number

Please recognize or change the correspondence address for the application identified in the attached transmittal letter to:

☒ The address associated with the above-mentioned Customer Number.

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant:

☐ Inventor or Joint Inventor

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor

☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (*e.g.,* a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document)

SIGNATURE of Applicant for Patent

Signature	/ptd47323/	Date	2 December 2013
Name	Peter T. DiMauro	Telephone	203 944-6711
Title and Company	Patent Agent, General Electric Company		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms for more than one signature, see below *.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

GE Docket No. 256975

COMBINED DECLARATION AND GLOBAL ASSIGNMENT

FOR UTILITY OR DESIGN PATENT APPLICATION

As the below named inventor(s), I/we hereby declare that:

This declaration and assignment are directed to:

ELECTRIC DRIVE SYSTEM AND ENERGY MANAGEMENT METHOD

☐ the specification of which is attached hereto OR

☒ United States application or PCT international application number 14/094086 filed on December 2, 2013, as amended on [date] (if applicable).
(We hereby authorize and request the Company or its delegated attorneys or agents to insert above the application number and filing date of the application when known.)

The above-identified application was made or authorized to be made by us.

We believe that we are original joint inventors of a claimed invention in the application.

We hereby acknowledge that any willful false statement made in this declaration is punishable under 18 USC § 1001 by fine or imprisonment of not more than five (5) years, or both.

We have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment referred to above.

We acknowledge the duty to disclose information which is material to the patentability of this application as defined in 37 CFR § 1.56, including, for continuation-in-part applications, material information which became available between the filing date of the prior application and the filing date of the continuation-in-part application.

In accordance with our obligation(s) under an Employee Innovation and Proprietary Information Agreement or (as applicable) arising out of other agreements (such as, but not limited to, the Services Agreement between General Electric Company, a New York corporation, and our employers), and/or for other good and valuable consideration of which we acknowledge receipt, I/we,

Inventor First Name	Inventor Middle Name	Inventor Last Name		Residence Town	Residence State	Residence Country
Jian		Zhou	of	Shanghai		CN
Fei		Xu	of	Shanghai		CN
Dong		Liu	of	Shanghai		CN
Hai		Qiu	of	Shanghai		CN
Pengju		Kang	of	Yorktown Heights	NY	USA

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 519

GE Docket No. 256975

hereby sell and assign to:

Name of Company: *General Electric Company*
Entity Type (optional): *New York corporation*
Address: *1 River Road, Schenectady, New York 12345 USA*

herein referred to as "Company", its successors and assigns our entire respective rights, titles and interests in and to the invention and improvements made or conceived by us described in the application(s) listed above and in the following table:

Country of Filing	Type of Filing	Application Number	Filing Date	Title
CN	Invention	201210509493.2	December 03, 2012	Electric drive system and energy management method

(We hereby authorize and request the Company or its delegated attorneys or agents to insert above the application number and filing date of the application(s) when known.)

and any and all applications for patent and patents therefrom in any and all countries, including all divisions, continuations, continuations-in-part, reexaminations, renewals, and reissues thereof, and all rights of priority resulting from the filing of the application(s), and authorize and request any official whose duty it is to issue patents, to issue any patent on the inventions and improvements resulting therefrom to the Company, or its successors or assigns, and agree that on request and without further consideration, we will communicate to the Company or its representatives or nominees any facts known to us respecting the inventions and improvements and testify in any legal proceeding, make all rightful oaths, sign all lawful papers and execute all instruments or documents required or requested for the making and prosecution of any applications of any type for patent, utility model, or other similar rights in all countries including, but not limited to, any provisional, non-provisional, continuation, continuation-in-part, divisional, renewal or substitute thereof, for any derivation proceedings relating thereto, and, as to any patents that issue from such applications, for any supplemental examination, derivation proceeding, opposition, post grant review, reissue, re-examination, inter partes review, or extension thereof, and generally do everything possible to aid the Company, its successors, assigns, and nominees to obtain and enforce proper patent protection for the invention and its improvements in all countries.

Remuneration claims of the inventor(s)/assignor(s) potentially arising from German Law on Employee Inventions, or any other respective country law, remain unaffected by this assignment.

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 520

GE Docket No. 256975

INVENTOR 1

Signature: _____ Date: 2013.2.22

Jian Zhou

Witnessed by: _____ Date: 2013.2.22

Signature

_____

Printed Name of Witness

Witnessed by: _____ Date: 2013.2.22

Signature

LIU YONGZHI

Printed Name of Witness

SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY

_____ Date: _____

Jian Zhou

STATE OF

ss.

COUNTY OF

This _____ day of _____, 2013 before me personally came the above-named **Jian Zhou**, to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he/she executed the same of his/her own free will for the purposes therein set forth.

Seal

_____

(Notary Public)

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
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Page 521

GE Docket No. 256975

INVENTOR 2

Signature: Fei Xu Date: 2013.02.20.
Fei Xu

Witnessed by: Xueqin Wu Date: 2013-02-20
Signature

Xueqin Wu
Printed Name of Witness

Witnessed by: Yong Li Date: 2013-2-20
Signature

Yong Li
Printed Name of Witness

SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY

_____ Date: _____

Fei Xu

STATE OF

ss.

COUNTY OF

This _____ day of _____, 2013 before me personally came the above-named Fei Xu, to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he/she executed the same of his/her own free will for the purposes therein set forth.

Seal

_____
(Notary Public)

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
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Page 522

GE Docket No. 256975

INVENTOR 3

Signature: Dong Liu Date: 2013. DEC. 3rd

Dong Liu

Witnessed by: Yizhuo Zhang Date: 2013. DEC. 3rd

Signature

Yizhuo Zhang

Printed Name of Witness

Witnessed by: He Huang Date: 2013 DEC. 3rd.

Signature

He Huang

Printed Name of Witness

SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY

_____ Date: _____

Dong Liu

STATE OF

ss.

COUNTY OF

This _____ day of _____, 2013 before me personally came the above-named **Dong Liu**, to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he/she executed the same of his/her own free will for the purposes therein set forth.

Seal

_____ (Notary Public)

v9.18.12

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
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Page 523

GE Docket No. 256975

INVENTOR 4

Signature: _____ Date: 2/5/2013

Hai Qiu

Witnessed by: _____ Date: 2/5/2013

Signature

Anbo Wu

Printed Name of Witness

Witnessed by: Wenqiang Yang Date: 2/5/2013

Signature

Wenqiang Yang

Printed Name of Witness

SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY

_____ Date: _____

Hai Qiu

STATE OF

ss.

COUNTY OF

This _____ day of _____, 2013 before me personally came the above-named **Hai Qiu**, to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he/she executed the same of his/her own free will for the purposes therein set forth.

Seal

_____

(Notary Public)

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
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Page 524

GE Docket No. 256975

INVENTOR 5

Signature: _____ Date: Feb. 17, 2013
Pengju Kang

Witnessed by: _____ Date: 2013. 2. 17
Signature

_____
Printed Name of Witness

Witnessed by: _____ Date: 2013.2.17
Signature

LIU YONGZHI
Printed Name of Witness

SECTION BELOW IS FOR USE ONLY IF SIGNING IN PRESENCE OF A NOTARY

_____ Date: _____

Pengju Kang

STATE OF

ss.

COUNTY OF

This _____ day of _____, 2013 before me personally came the above-named **Pengju Kang**, to me personally known as the individual who executed the foregoing assignment, who acknowledged to me that he/she executed the same of his/her own free will for the purposes therein set forth.

Seal

_____
(Notary Public)

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 525

Electronic Acknowledgement Receipt

EFS ID:	18535168
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	52082
Filer:	Peter DiMauro/Eileen McCaughern
Filer Authorized By:	Peter DiMauro
Attorney Docket Number:	256975
Receipt Date:	20-MAR-2014
Filing Date:	02-DEC-2013
Time Stamp:	13:57:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	256975-2-US-revPOA.pdf	197384 176cb3d61870eb5d1e458844ea54385595 9f28bf	no	3

Warnings:	
Information:	

2	Oath or Declaration filed	256975-2-US-revExec-CombDecandAssgn12213.pdf	197210 8a29b6610383b8a1fdd6e01291ea39069dd94479	no	7

Warnings:

The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing

Information:

Total Files Size (in bytes):	394594

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/094,086

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*			OR	x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1600

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/094,086	12/02/2013	2414	1740	256975	20	2

CONFIRMATION NO. 1896

52082
General Electric Company
GE Global Patent Operation
2 Corporate Drive, Suite 648
Shelton, CT 06484

FILING RECEIPT

OC000000066542541

Date Mailed: 02/20/2014

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Jian Zhou, Shanghai, CHINA;
Fei Xu, Shanghai, CHINA;
Dong Liu, Shanghai, CHINA;
Hai Qiu, Shanghai, CHINA;
Pengju Kang, Yorktown Heights, NY;

Applicant(s)

General Electric Company, Schenectady, NY

Assignment For Published Patent Application

General Electric Company, Schenectady, NY

Power of Attorney: None

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
CHINA 201210509493.2 12/03/2012 No Access Code Provided

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 02/10/2014

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 529

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/094,086**

Projected Publication Date: 06/05/2014

Non-Publication Request: No

Early Publication Request: No

Title

Electric Drive System and Energy Management Method

Preliminary Class

370

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
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LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 531

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/094,086	12/02/2013	Jian Zhou	256975

CONFIRMATION NO. 1896

52082
General Electric Company
GE Global Patent Operation
2 Corporate Drive, Suite 648
Shelton, CT 06484

NOTICE

OC000000066542542

Date Mailed: 02/20/2014

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Jian Zhou
  Fei Xu
  Dong Liu
  Hai Qiu
  Pengju Kang

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 532

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/094,086	12/02/2013	Jian Zhou	256975

CONFIRMATION NO. 1896

IMPROPER CPOA LETTER

52082
General Electric Company
GE Global Patent Operation
2 Corporate Drive, Suite 648
Shelton, CT 06484

OC000000066542592

Date Mailed: 02/20/2014

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the power of attorney filed 12/02/2013. The power of attorney in this application is not accepted for the reason(s) listed below:

- The revocation is not signed by the applicant, the assignee of the entire interest, or one particular principal attorney having the authority to revoke.

/tmekuria/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004
Page 533

To: gpo.mail@ge.com,marie.gerrie@ge.com,allyson.carnaroli@ge.com
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 52082

Feb 20, 2014 05:23:57 AM

Dear PAIR Customer:

General Electric Company
GE Global Patent Operation
2 Corporate Drive, Suite 648
Shelton, CT 06484
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 52082 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
14094086	APP.FILE.REC	02/20/2014	256975
	M327	02/20/2014	256975
	N572	02/20/2014	256975

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82A (07-12)

Approved for use through 11/30/2014. OMB 0651-0035

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B or equivalent) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5. If the Power of Attorney by Applicant form is not accompanied by this transmittal form or an equivalent, the Power of Attorney will not be recognized in the application.

Application Number	Filed concurrently herewith
Filing Date	Filed concurrently herewith
First Named Inventor	Jian Zhou
Title	Electric Drive System and Energy Management Method
Art Unit	
Examiner Name	
Attorney Docket Number	256975

SIGNATURE of Applicant or Patent Practitioner

Signature	/ptd47323/	Date	
Name	Peter T. DiMauro	Telephone	203-944-6711
Registration Number	47323		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82B(07-12)
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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in the attached transmittal letter.

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

52082

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

Name	Registration Number	Name	Registration Number

Please recognize or change the correspondence address for the application identified in the attached transmittal letter to:

☒ The address associated with the above-mentioned Customer Number.

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant:

☐ Inventor or Joint Inventor

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor

☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (*e.g.,* a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document)

SIGNATURE of Applicant for Patent

Signature	/ptd47323/	Date	2 December 2013
Name	Peter T. DiMauro	Telephone	203 944-6711
Title and Company	Patent Agent, General Electric Company		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms for more than one signature, see below *.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Filer:	Peter DiMauro/Eileen McCaughern
Attorney Docket Number:	256975

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1600**

Electronic Acknowledgement Receipt

EFS ID:	17539402
Application Number:	14094086
International Application Number:	
Confirmation Number:	1896
Title of Invention:	Electric Drive System and Energy Management Method
First Named Inventor/Applicant Name:	Jian Zhou
Customer Number:	52082
Filer:	Peter DiMauro/Eileen McCaughern
Filer Authorized By:	Peter DiMauro
Attorney Docket Number:	256975
Receipt Date:	02-DEC-2013
Filing Date:	
Time Stamp:	16:20:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1600
RAM confirmation Number	3633
Deposit Account	090470
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	256975-2-US-ADS.pdf	1505706 52a0e08ed0e8217d5ec12cf8ea5ca57ff06c0c16	no	8
Warnings:					
Information:					
2	Drawings-only black and white line drawings	256975-2-US-Drawings02DEC2013.pdf	1053042 34ebb94f7064a7db078ef1fe0525e1aafc66705d	no	10
Warnings:					
Information:					
3		256975-2-US_Application.pdf	395334 54889bc724e16a6e1bea87937e8284faa32bcb12	yes	27

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	19
Claims	20	26
Abstract	27	27

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Information:

4	Power of Attorney	256975-2-US-revPOA.pdf	197464 a16021d6f66e72236c3cdd1377bea3eff65f8967	no	3
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	32536 6055defd7553b83be9c194fee3f700f01f94c3d8	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3184082		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/14 (03-13)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	256975
	Application Number	
Title of Invention	Electric Drive System and Energy Management Method	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jian		Zhou	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Shanghai	Country of Residence i	CN

Mailing Address of Inventor:

Address 1	General Electric Company		
Address 2	1 River Road		
City	Schenectady	**State/Province**	NY
Postal Code	12345	**Country** i	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Fei		Xu	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Shanghai	Country of Residence i	CN

Mailing Address of Inventor:

Address 1	General Electric Company		
Address 2	1 River Road		
City	Schenectady	**State/Province**	NY
Postal Code	12345	**Country** i	US

Inventor 3 Remove

Legal Name

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	256975
	Application Number	
Title of Invention	Electric Drive System and Energy Management Method	

Prefix	Given Name	Middle Name	Family Name	Suffix
	Dong		Liu	

Residence Information (Select One) (•) US Residency ( ) Non US Residency ( ) Active US Military Service

City	Shanghai	State/Province		Country of Residence i	CN

Mailing Address of Inventor:

Address 1	General Electric Company		
Address 2	1 River Road		
City	Schenectady	State/Province	NY
Postal Code	12345	Country i	US

Inventor 4 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Hai		Qiu	

Residence Information (Select One) (•) US Residency ( ) Non US Residency ( ) Active US Military Service

City	Shanghai	State/Province		Country of Residence i	CN

Mailing Address of Inventor:

Address 1	General Electric Company		
Address 2	1 River Road		
City	Schenectady	State/Province	NY
Postal Code	12345	Country i	US

Inventor 5 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Pengju		Kang	

Residence Information (Select One) (•) US Residency ( ) Non US Residency ( ) Active US Military Service

City	Yorktown Heights	State/Province	NY	Country of Residence i	US

Mailing Address of Inventor:

Address 1	General Electric Company		
Address 2	1 River Road		
City	Schenectady	State/Province	NY
Postal Code	12345	Country i	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	256975
	Application Number	
Title of Invention	Electric Drive System and Energy Management Method	

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence Information of this application.			
Customer Number	52082		
Email Address	gpo.mail@ge.com	Add Email	Remove Email

Application Information:

Title of the Invention	Electric Drive System and Energy Management Method		
Attorney Docket Number	256975	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	10	**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

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Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

Toyota Motor Corp. v. Bunker Hill Technologies, LLC
IPR 2026-00333 BHILL Ex. 2004

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	256975
	Application Number	
Title of Invention	Electric Drive System and Energy Management Method	

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Remove

Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code [i] (if applicable)
201210509493.2	CN	2012-12-03	

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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	256975
	Application Number	
Title of Invention	Electric Drive System and Energy Management Method	

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In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

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If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

(•) Assignee	( ) Legal Representative under 35 U.S.C. 117	( ) Joint Inventor
( ) Person to whom the inventor is obligated to assign.	( ) Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. [X]

Organization Name	General Electric Company		
Mailing Address Information:			
Address 1	1 River Road		
Address 2			
City	Schenectady	**State/Province**	NY
Country [i]	US	Postal Code	12345
Phone Number	203 944 6745	Fax Number	203 944 6712

PTO/AIA/14 (03-13)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	256975
	Application Number	
Title of Invention	Electric Drive System and Energy Management Method	

Email Address	gpo.mail@ge.com

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Address 2	

City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

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Signature	/ptd47323/			Date (YYYY-MM-DD)	2013-12-02
First Name	Peter	Last Name	DiMauro	Registration Number	47323

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	Application Number	
Title of Invention	Electric Drive System and Energy Management Method	

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

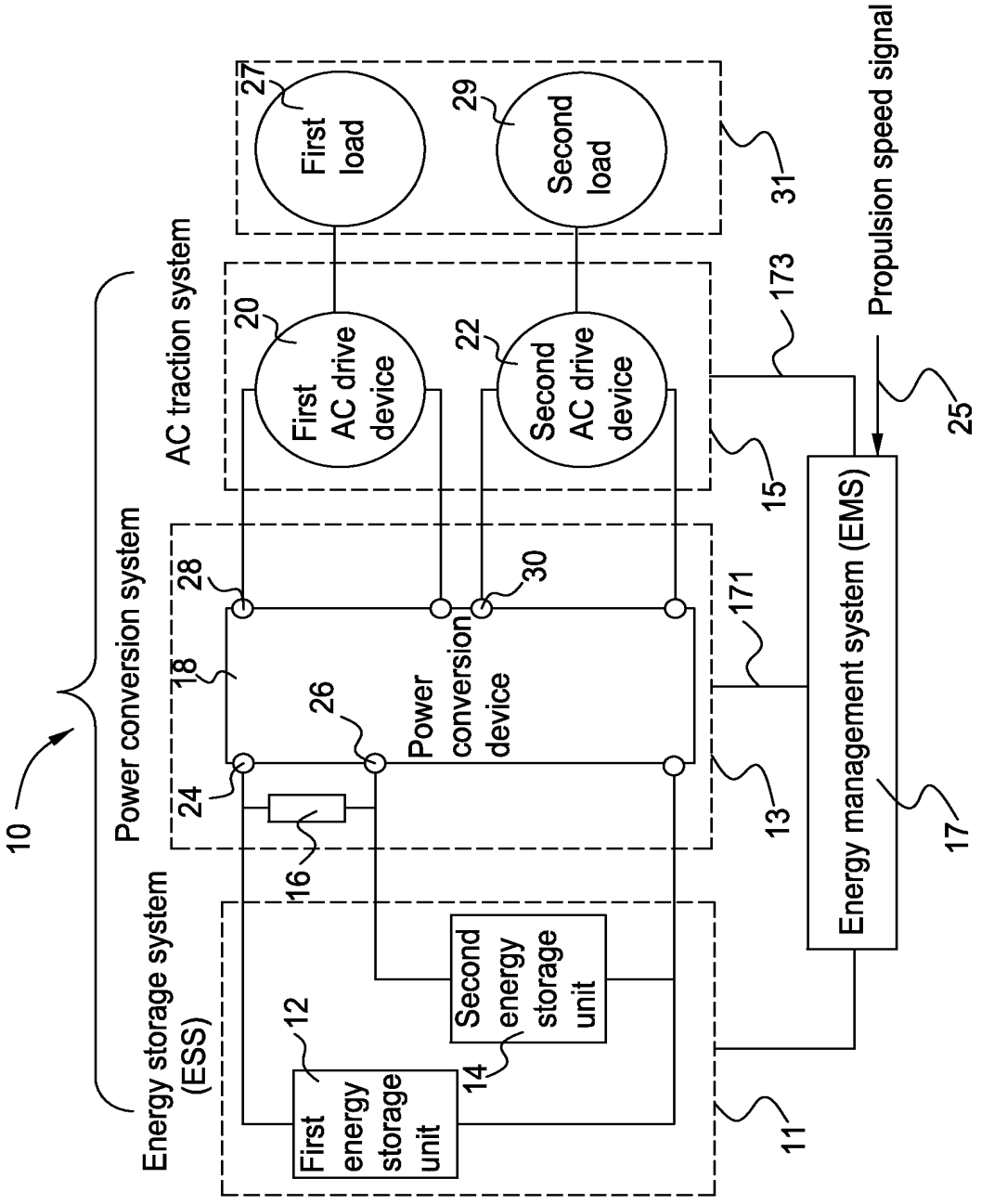

10
Energy storage system (ESS)
Power conversion system
AC traction system
Energy management system (EMS)
Propulsion speed signal
First energy storage unit
Second energy storage unit
Power conversion device
First AC drive device
Second AC drive device
First load
Second load
11
12
13
14
15
16
17
18
20
22
24
25
26
27
28
29
30
31
171
173

FIG. 1

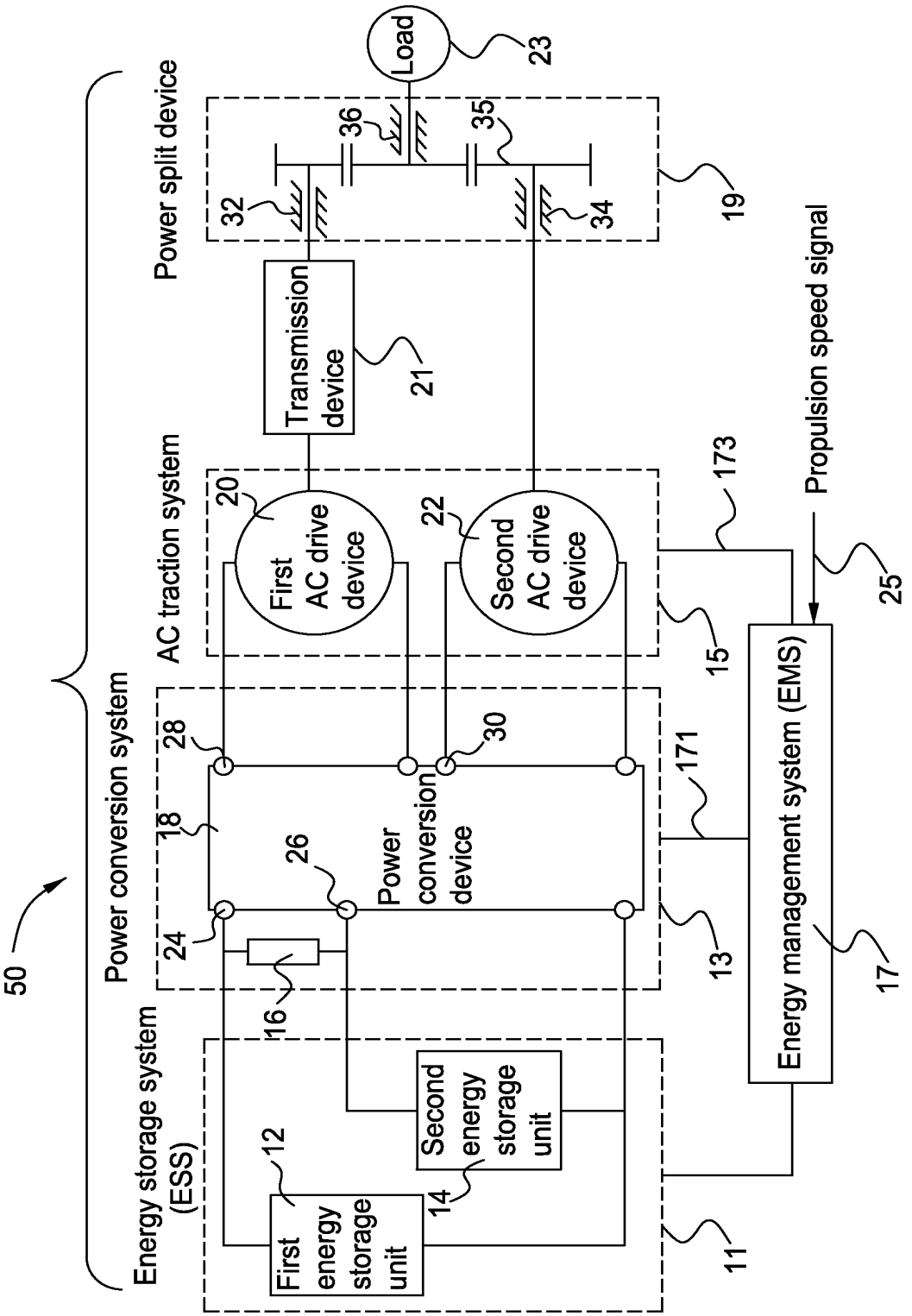

50
Power conversion system
Energy storage system (ESS)
First energy storage unit
Second energy storage unit
12
14
16
11
Power conversion device
18
24
26
28
30
13
AC traction system
First AC drive device
Second AC drive device
20
22
15
171
173
Power split device
Transmission device
21
19
32
34
35
36
Load
23
Energy management system (EMS)
17
Propulsion speed signal
25

FIG. 2

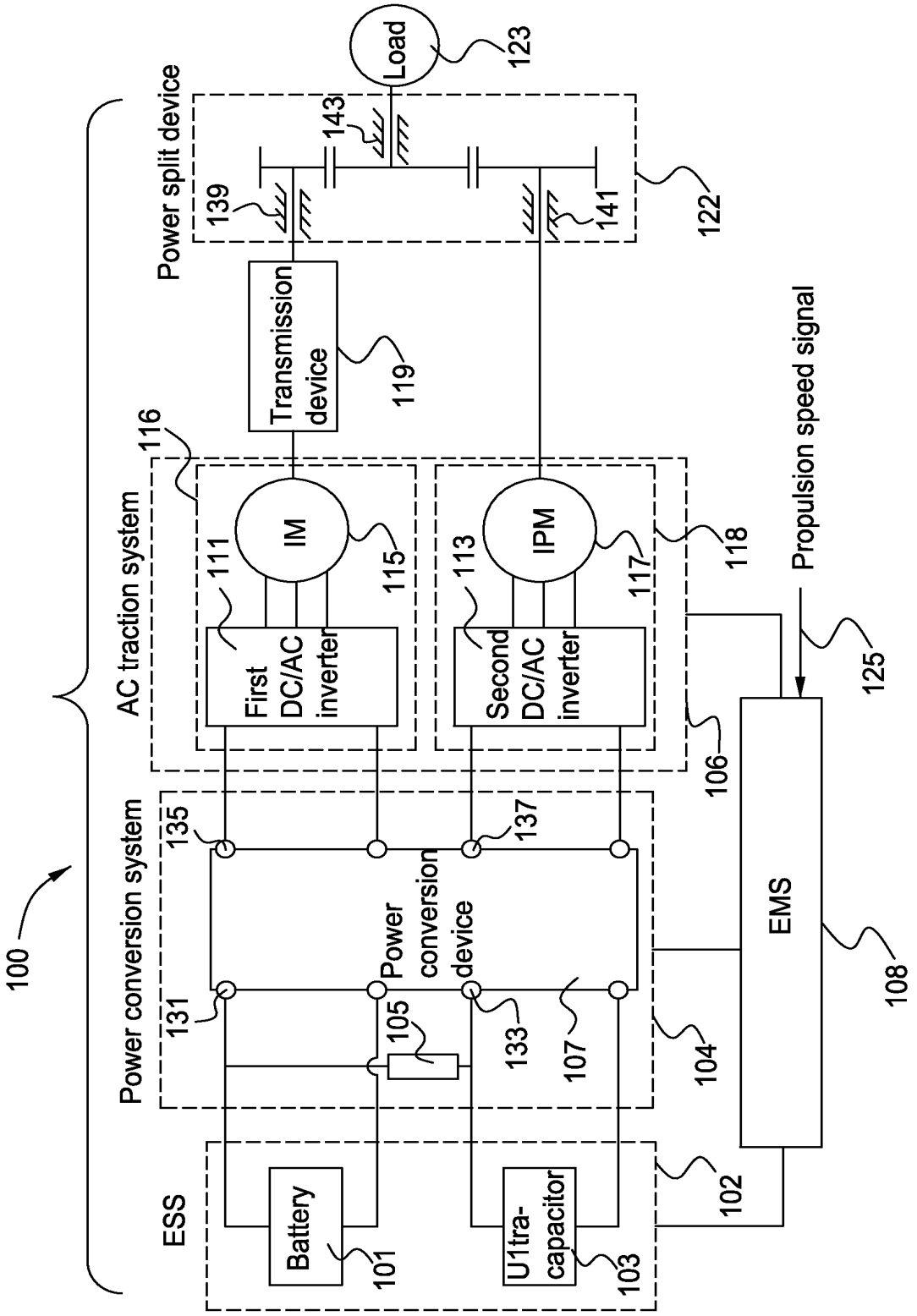

100
Load
123
Power split device
143
139
141
122
Transmission device
119
116
AC traction system
IM
111
115
First DC/AC inverter
IPM
113
117
Second DC/AC inverter
118
Propulsion speed signal
125
106
Power conversion system
135
137
Power conversion device
131
105
133
107
104
EMS
108
ESS
Battery
101
U1tra-capacitor
103
102

FIG. 3

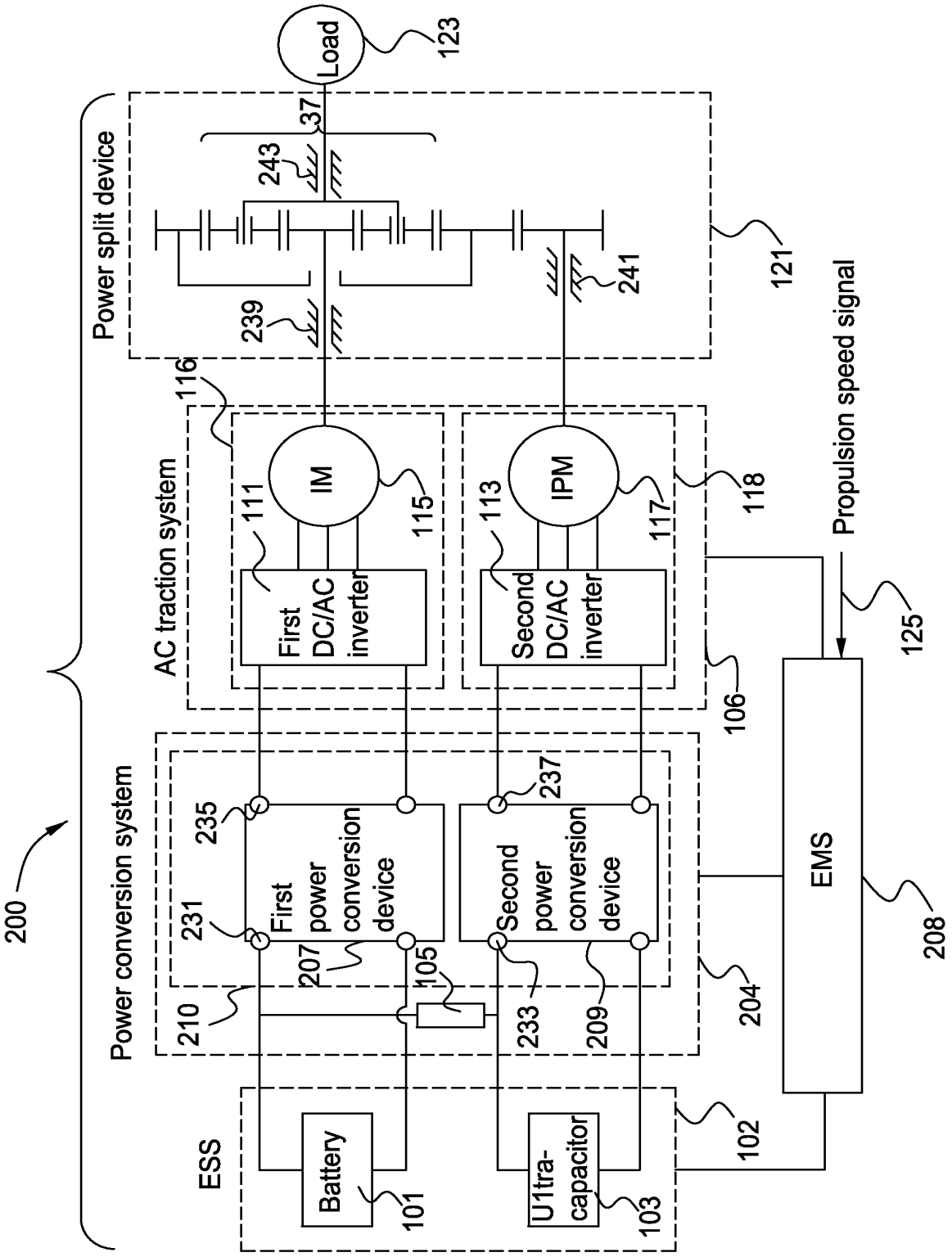

200
Power conversion system
Power split device
AC traction system
Load
123
37
243
239
241
121
116
IM
111
115
IPM
113
117
118
First DC/AC inverter
Second DC/AC inverter
106
Propulsion speed signal
125
235
231
First power conversion device
207
105
237
Second power conversion device
210
233
209
204
EMS
208
ESS
Battery
101
U1tra-capacitor
103
102

FIG. 4

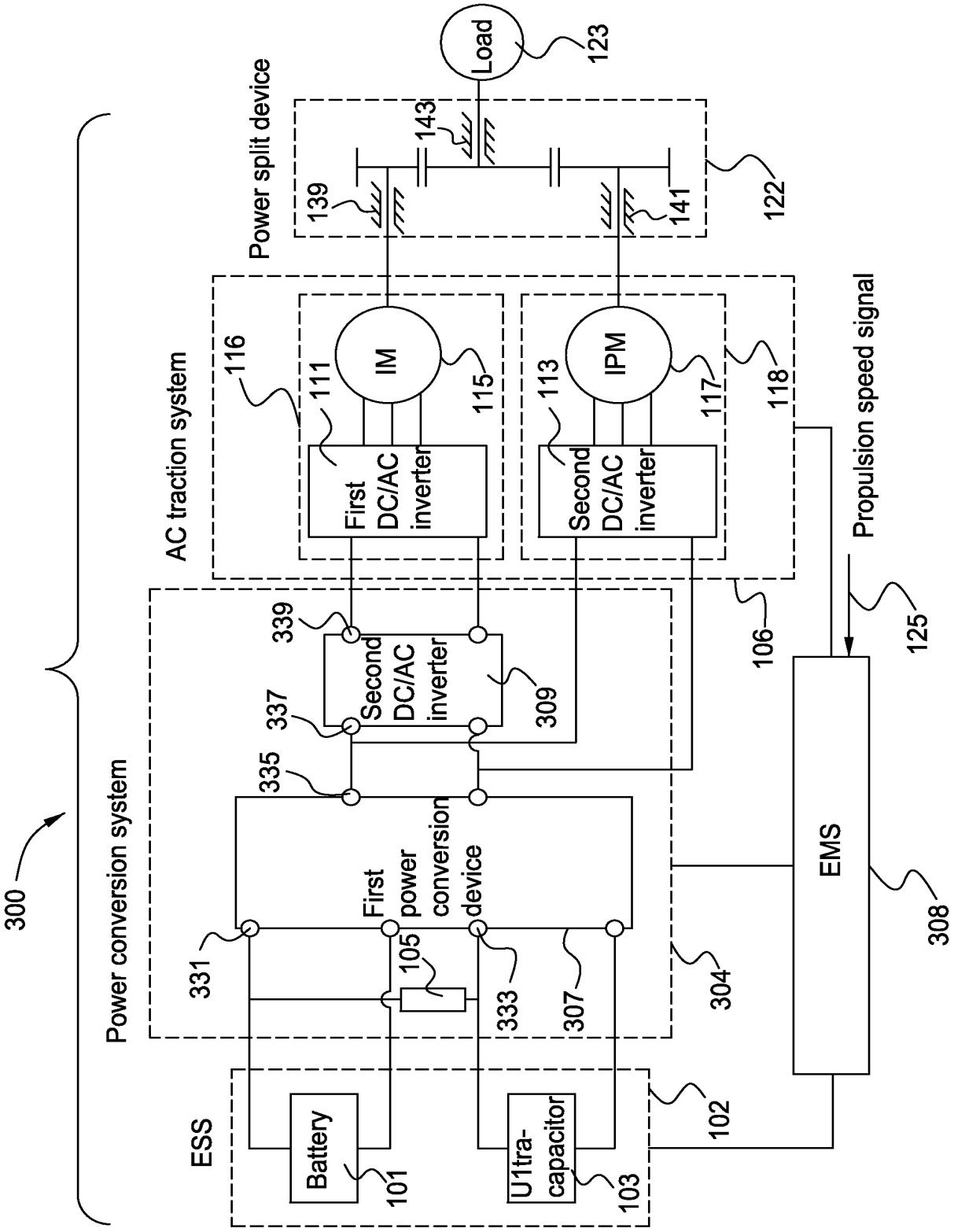

300
Power conversion system
ESS
Battery
101
U1tra-capacitor
103
102
331
105
333
307
First power conversion device
335
337
Second DC/AC inverter
309
339
304
106
AC traction system
116
111
First DC/AC inverter
IM
115
113
Second DC/AC inverter
IPM
117
118
Power split device
139
143
141
122
Load
123
EMS
308
Propulsion speed signal
125

FIG. 5

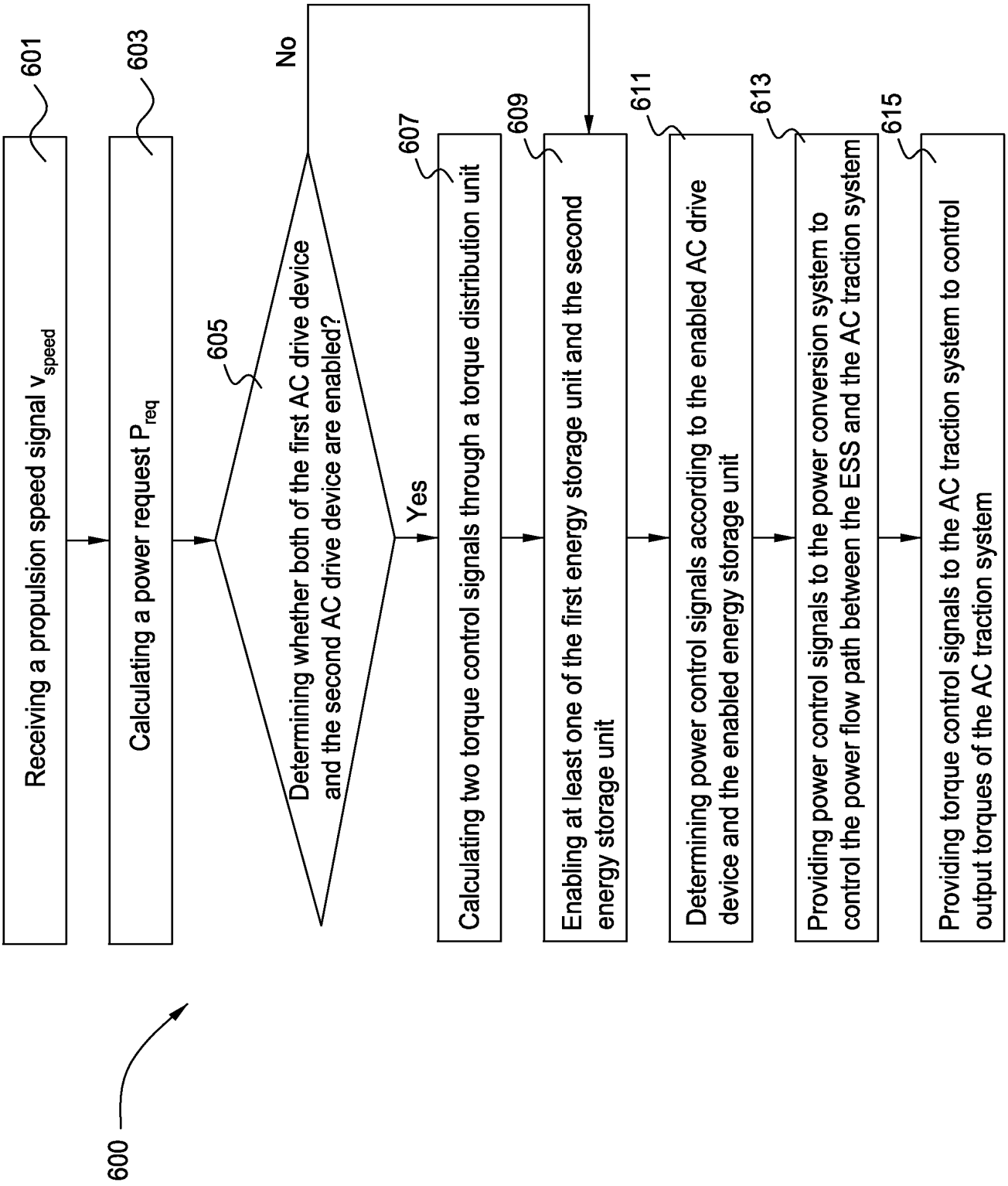

600
601
Receiving a propulsion speed signal v_{speed}
603
Calculating a power request P_{req}
605
Determining whether both of the first AC drive device and the second AC drive device are enabled?
No
Yes
607
Calculating two torque control signals through a torque distribution unit
609
Enabling at least one of the first energy storage unit and the second energy storage unit
611
Determining power control signals according to the enabled AC drive device and the enabled energy storage unit
613
Providing power control signals to the power conversion system to control the power flow path between the ESS and the AC traction system
615
Providing torque control signals to the AC traction system to control output torques of the AC traction system

FIG. 6

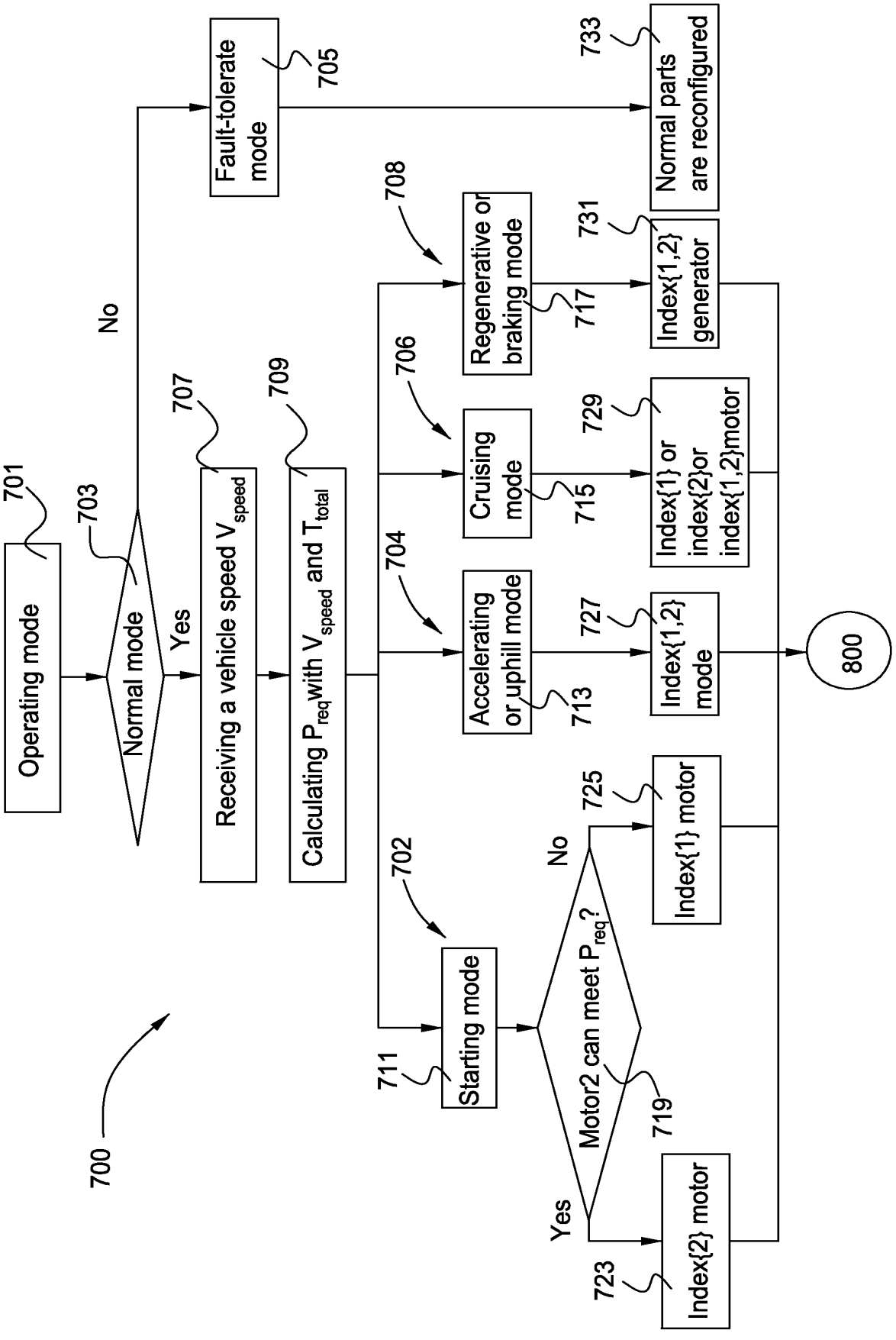

700
Operating mode
701
Normal mode
703
No
Yes
Fault-tolerate mode
705
Receiving a vehicle speed V_{speed}
707
Calculating P_{req} with V_{speed} and T_{total}
709
Starting mode
711
Accelerating or uphill mode
713
Cruising mode
715
Regenerative or braking mode
717
Motor2 can meet P_{req}?
719
Index{2} motor
723
Index{1} motor
725
Index{1,2} mode
727
Index{1} or index{2}or index{1,2}motor
729
Index{1,2} generator
731
Normal parts are reconfigured
733
800
702
704
706
708

FIG. 7

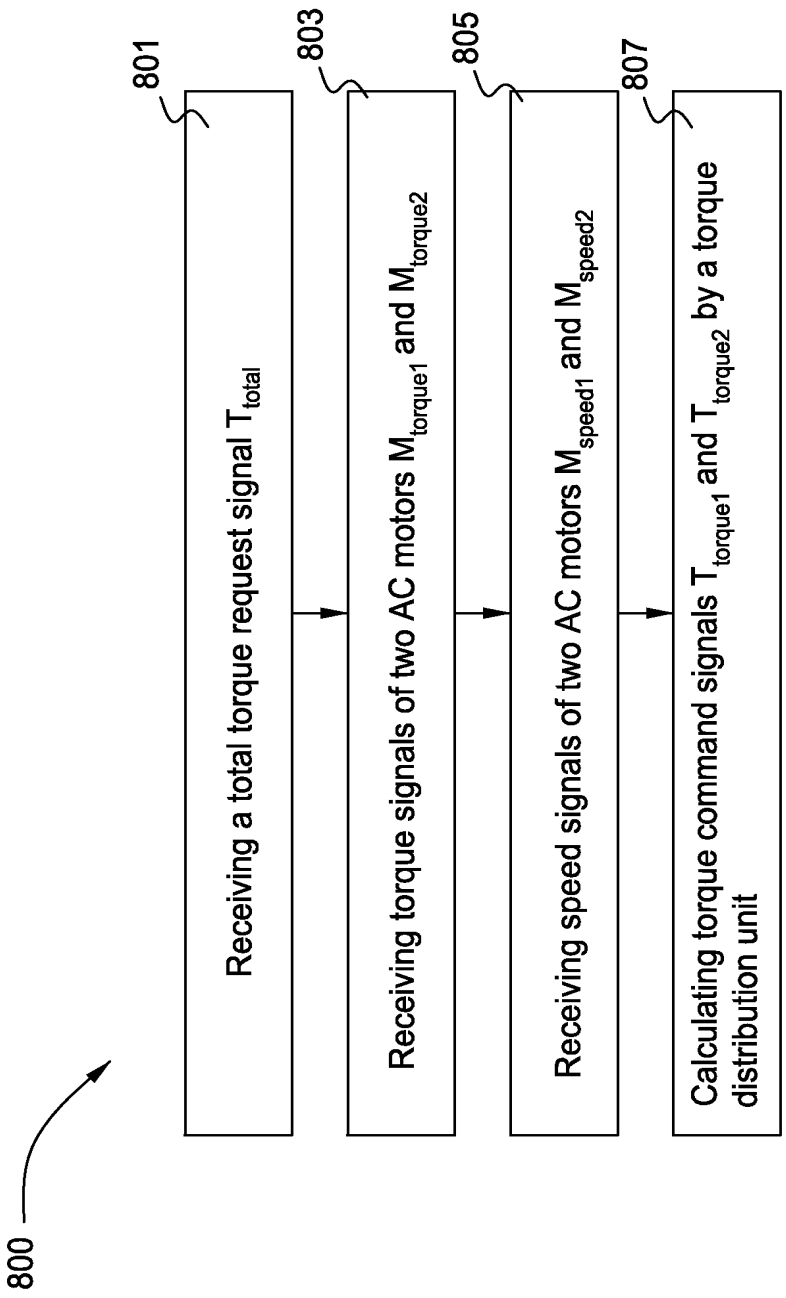

800
801
Receiving a total torque request signal T_{total}
803
Receiving torque signals of two AC motors $M_{torque1}$ and $M_{torque2}$
805
Receiving speed signals of two AC motors M_{speed1} and M_{speed2}
807
Calculating torque command signals $T_{torque1}$ and $T_{torque2}$ by a torque distribution unit

FIG. 8

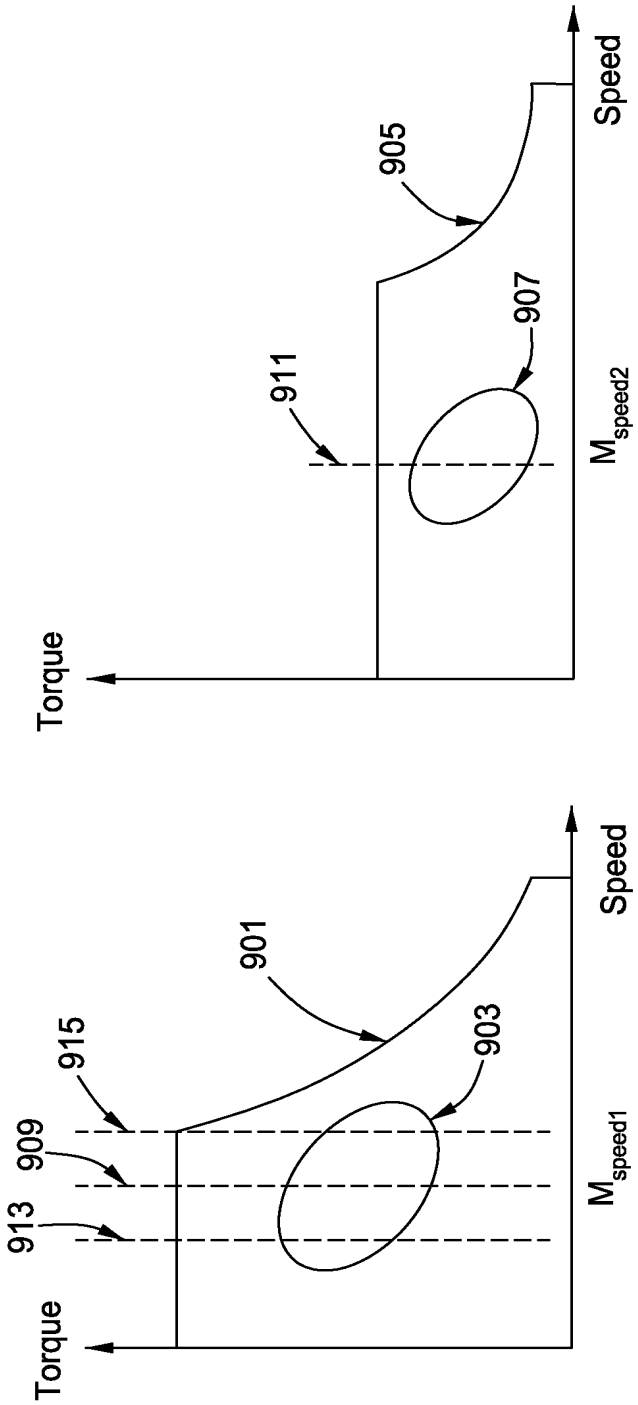

Speed
905
907
911
M_{speed2}
Torque
Speed
901
915
903
909
913
M_{speed1}
Torque

FIG. 9

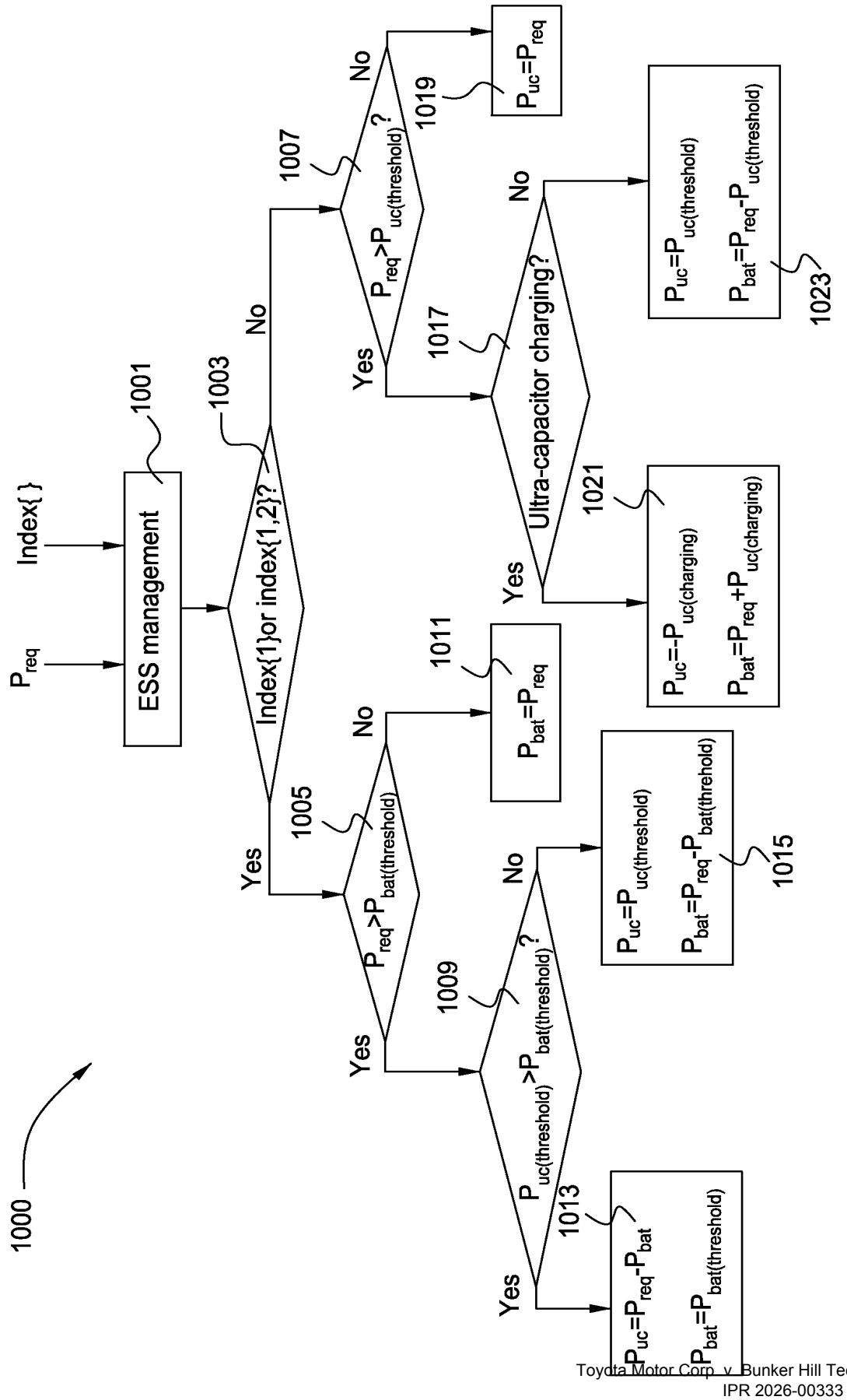

1000
Index{ }
P_{req}
ESS management
1001
Index{1}or index{1,2}?
1003
No
Yes
$P_{req}>P_{bat(threshold)}$?
1005
No
Yes
$P_{bat}=P_{req}$
1011
$P_{uc(threshold)}>P_{bat(threshold)}$?
1009
No
Yes
$P_{uc}=P_{uc(threshold)}$
$P_{bat}=P_{req}-P_{bat(threshold)}$
1015
$P_{uc}=P_{req}-P_{bat}$
$P_{bat}=P_{bat(threshold)}$
1013
$P_{req}>P_{uc(threshold)}$?
1007
No
Yes
$P_{uc}=P_{req}$
1019
Ultra-capacitor charging?
1017
No
Yes
$P_{uc}=P_{uc(threshold)}$
$P_{bat}=P_{req}-P_{uc(threshold)}$
1023
$P_{uc}=-P_{uc(charging)}$
$P_{bat}=P_{req}+P_{uc(charging)}$
1021

FIG. 10

ELECTRIC DRIVE SYSTEM AND ENERGY MANAGEMENT METHOD

BACKGROUND

[0001] Embodiments of the disclosure relate generally to electric drive systems and energy management methods, useful in a variety of propulsion systems such as an electric vehicle (EV) system.

[0002] With the increased concern about energy crisis and environmental pollution caused by the fossil fuel exhaust, there is a growing interest in developing electric-powered vehicles, in which conventional fossil energy may be replaced by energy sources such as lead-acid batteries, fuel cells, flywheel batteries, etc. Electric drive system is one of the key components in the electric-powered vehicles. In the electric drive system, several kinds of AC motors such as induction motor (IM), interior permanent motor (IPM) and switched reluctance motor (SRC) are widely used for converting electric power into mechanical torques. It is desired that the propulsion system may have features of high efficiency, and high performance with low cost. These features may be achieved by choosing appropriate energy sources, appropriate AC motors, and then combining them together in an appropriate structure.

[0003] Currently, most of the electric drive systems include a single energy storage system (ESS) or a single motor, or a dual ESS with a single motor. However, on the one hand, a single ESS may not satisfy both the energy and power requirements such as low energy, slow charging rate, and a shorter life due to its own limitation of charge/discharge characteristics. On the other hand, a single motor may not work with a high efficiency across the entire operating range. It will cause problems of oversize, high cost, and low efficiency in order to meet high performances such as a short acceleration time and a long running mileage of the propulsion system.

[0004] Therefore, it is desirable to provide systems and methods to address the above-mentioned problems.

BRIEF DESCRIPTION

[0005] In accordance with one embodiment disclosed herein, an electric drive system is provided. The electric drive system includes an energy storage system (ESS), a power conversion system, an AC traction system, and an energy management system (EMS). The ESS

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includes a first energy storage unit for providing or receiving a first power and a second energy storage unit for providing or receiving a second power. The power conversion system is electrically coupled to the ESS for converting an input power to an output power. The power conversion system includes a power conversion device. The power conversion device includes a first terminal coupled to the first energy storage unit, a second terminal coupled to the second energy storage unit, a third terminal, and a fourth terminal. The AC traction system is electrically coupled to the power conversion system for converting the output power of the power conversion system to mechanical torques. The AC traction system includes a first AC drive device and a second AC drive device. The first AC drive device is coupled to the third terminal of the power conversion device for providing or receiving a first mechanical torque. The second AC drive device is coupled to the fourth terminal of the power conversion device for providing or receiving a second mechanical torque. The EMS is in communication with the ESS, the AC traction system, and the power conversion system for providing control signals.

[0006] In accordance with another embodiment disclosed herein, an energy management method is provided. The energy management method includes enabling at least one of the first AC drive device and the second AC drive device based at least in part on an electric drive system speed signal. The energy management method includes enabling at least one of a first energy storage unit and a second energy storage unit. The energy management method includes sending power control signals to the power conversion system for controlling power flow paths in the electric drive system. The controlling of the power flow paths includes receiving or providing an input power by at least one of a first terminal and a second terminal of the power conversion system and providing or receiving an output power by at least one of a third terminal and a fourth terminal of the power conversion system.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] These and other features, aspects, and advantages of the present disclosure will become better understood when the following detailed description is read with reference to the accompanying drawings in which like characters represent like parts throughout the drawings, wherein:

[0008] FIG. 1 is a block diagram of an electric drive system applied in a propulsion system for driving two loads in accordance with an exemplary embodiment of the present disclosure;

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[0009] FIG. 2 is a block diagram of an electric drive system applied in a propulsion system for driving a single load in accordance with an exemplary embodiment of the present disclosure;

[0010] FIG. 3 is a diagram of an electric drive system applied in an electric vehicle (EV) system in accordance with an exemplary embodiment of the present disclosure;

[0011] FIG. 4 is a diagram of an electric drive system with two separate power conversion devices coupled in parallel applied in an EV system in accordance with an exemplary embodiment of the present disclosure;

[0012] FIG. 5 is a diagram of an electric drive system with two separate power conversion devices coupled in series applied in an EV system in accordance with an exemplary embodiment of the present disclosure;

[0013] FIG. 6 is a flowchart of an energy management method for controlling power flow in an electric drive system in accordance with an exemplary embodiment of the present disclosure;

[0014] FIG. 7 is a flowchart of determining whether both of the first AC drive device and the second AC drive device are enabled shown in FIG. 6 in accordance with an exemplary embodiment of the present disclosure;

[0015] FIG. 8 is a flowchart of calculating two torque control signals through a torque distribution unit shown in FIG. 6 in accordance with an exemplary embodiment of the present disclosure;

[0016] FIG. 9 is a graph of torque-speed waveforms of AC traction system used in FIG. 8 in accordance with an exemplary embodiment of the present disclosure; and

[0017] FIG. 10 is a flowchart of enabling at least one of the first energy storage unit and the second energy storage unit shown in FIG. 6 in accordance with an exemplary embodiment of the present disclosure.

DETAILED DESCRIPTION

[0018] In an effort to provide a concise description of these embodiments, not all features of an actual implementation are described in one or more specific embodiments. It should be appreciated that in the development of any such actual implementation, as in any engineering or design project, numerous implementation-specific decisions must be made to achieve the

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developers' specific goals, such as compliance with system-related and business-related constraints, which may vary from one implementation to another. Moreover, it should be appreciated that such a development effort might be complex and time consuming, but would nevertheless be a routine undertaking of design, fabrication, and manufacture for those of ordinary skill having the benefit of this disclosure.

[0019] Unless defined otherwise, technical and scientific terms used herein have the same meaning as is commonly understood by one of ordinary skill in the art to which this disclosure belongs. The terms "first," "second," "third," "fourth," and the like, as used herein do not denote any order, quantity, or importance, but rather are used to distinguish one element from another. Also, the terms "a" and "an" do not denote a limitation of quantity, but rather denote the presence of at least one of the referenced items. The term "or" is meant to be inclusive and mean either any, several, or all of the listed items. The use of "including," "comprising," or "having," and variations thereof herein are meant to encompass the items listed thereafter and equivalents thereof as well as additional items.

[0020] As used herein, the terms "may," "can," "may be," and "can be" indicate a possibility of an occurrence within a set of circumstances; a possession of a specified property, characteristic or function; and/or qualify another verb by expressing one or more of an ability, capability, or possibility associated with the qualified verb. Accordingly, usage of "may," "can," "may be," and "can be" indicate that a modified term is apparently appropriate, capable, or suitable for an indicated capacity, function, or usage, while taking into account that in some circumstances, the modified term may sometimes not be appropriate, capable, or suitable. For example, in some circumstances, an event or capacity may be expected, while in other circumstances, the event or capacity may not occur. This distinction is captured by the terms "may," "can," "may be," and "can be".

[0021] FIG. 1 illustrates a block diagram of an electric drive system 10 applied in a propulsion system (not shown) for driving two loads in accordance with an exemplary embodiment of the present disclosure. The propulsion system may include a forklift system and a crane system, for example. The electric drive system 10 includes an ESS 11, a power conversion system 13, an AC traction system 15, and an energy management system (EMS) 17. In some embodiments, the power conversion system 13 is configured for converting a DC power

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generated from the ESS 11 into another DC power provided to the AC traction system 15. In some embodiments, the power conversion system 13 is configured for converting a DC power generated from the AC traction system 15 into another DC power for charging the ESS 11.

[0022] The EMS 17 is arranged to be in electrical communication with the ESS 11, the power conversion system 13, and the AC drive system 15. In some embodiments, the EMS 17 may be configured to send power control signals 171 to enable the power conversion system 13 to provide necessary DC power for the AC traction system 15. In some embodiments, the EMS 17 may be configured to send power control signals 171 to enable the power conversion system 18 to provide necessary DC power for charging the ESS 11. In some embodiments, the EMS 17 may be configured to send torque control signals 173 to the AC traction system 15 according to one or more command signals (e.g., electric drive system speed signal 25) to enable the AC traction system 15 to provide necessary mechanical torques to the load system 31.

[0023] In some embodiments, the ESS 11 includes a first energy storage unit 12 for providing or receiving a first power and a second energy storage unit 14 for providing or receiving a second power. In some embodiments, the ESS 11 may include more than two energy storage units. In some embodiments, the AC traction system 15 includes a first AC drive device 20 for providing or receiving a first mechanical torque and a second AC drive device 22 for providing or receiving a second mechanical torque. In some embodiments, the AC traction system 15 may include more than two AC drive devices.

[0024] The power conversion system 13 includes a power conversion device 18. The power conversion device 18 includes a first terminal 24 electrically coupled to the first energy storage unit 12, a second terminal 26 electrically coupled to the second energy storage unit 14, a third terminal 28 electrically coupled to the first AC drive device 20, and a fourth terminal 30 electrically coupled to the second AC drive device 22. In some embodiments, the power conversion device 18 may include more than four terminals.

[0025] When the electric drive system 10 is operated in an electric driven mode, in some embodiments, the first terminal 24 may be configured to receive a first input power from the first energy storage unit 12, and the second terminal 26 may be configured to receive a second input power from the second energy storage unit 14. In some embodiments, the power conversion device 18 is configured to perform power conversion with respect to the received first input

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power and second input power, provide a first output power at the third terminal 28, and provide a second output power at the fourth terminal 30. The first output power may be provided to the first AC drive device 20, and the second output power may be provided to the second AC drive device 22.

[0026] When the electric drive system 10 is operated in a regenerative or braking mode, in some embodiments, the third terminal 28 may be configured to receive a first input power from the first AC drive device 20, and the fourth terminal 30 may be configured to receive a second input power from the second AC drive device 22. In some embodiments, the power conversion device 18 is configured to perform power conversion with respect to the received first input power and the second input power, provide first output power at the first terminal 24 for charging the ESS 11 (e.g., first energy storage unit 12), and provide second output power at the second terminal 26 for charging the ESS 11 (e.g., second energy storage unit 14).

[0027] The power conversion system 13 may include a pre-charging switching device 16 electrically coupled between the first energy storage unit 12 and the second energy storage unit 14 for selectively providing a power flow path between the first energy storage unit 12 and the second energy storage unit 14. In some embodiments, the power flow path may be unidirectional, so that the first energy storage unit 12 may deliver electric power through the unidirectional power flow path for charging the second energy storage unit 14. In some embodiments, the power flow path may be bi-directional, so that the electric power can be delivered between the first energy storage unit 12 and the second energy storage unit 14 through the bi-directional power flow path.

[0028] A load system 31 may include a first load 27 coupled to the first AC drive device 20 and a second load 29 coupled to the second AC drive device 22. In some embodiments, the first load 27 and the second load 29 may receive a first mechanical torque from the first AC drive device 20 and a second mechanical torque from the second AC drive device 22 respectively. In some embodiments, when the electric drive system 10 is operated in the regenerative or braking mode, the first load 27 and the second load 29 may provide a first mechanical torque and a second mechanical torque to the first AC drive device 20 and the second AC drive device 22 respectively. Then the first and second mechanical torques may be converted by the first and second AC drive devices 20, 22, respectively, into electric power for charging the ESS 11.

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[0029] With a combination of at least two energy storage units, at least one power providing or receiving action may be taken in an appropriate manner to improve the power utilization and extend the life of ESS. With a combination of at least two AC drive devices, at least one power conversion action may be taken in a flexible manner to improve the efficiency of the electric drive system.

[0030] FIG. 2 illustrates a block diagram of an electric drive system 50 applied in a propulsion system (not shown) for driving a single load 23 in accordance with an exemplary embodiment of the present disclosure. The propulsion system may include an EV system and an elevator system. The electric drive system 50 is similar to the electric drive system 10 shown in FIG. 1 and includes the ESS 11, the power conversion system 13, the AC traction system 15, and the EMS 17. Thus, detail description about the ESS 11, the power conversion system 13, the AC traction system 15, and the EMS 17 are omitted herein. In some embodiments, the electric drive system 50 includes a power split device 19 mechanically coupled between the AC traction system 15 and the load 23.

[0031] The power split device 19 includes a first mechanical terminal 32, a second mechanical terminal 34, and a third mechanical terminal 36. The first mechanical terminal 32 is mechanically coupled to the first AC drive device 20 for receiving or providing a first mechanical torque. The second mechanical terminal 34 is mechanically coupled to the second AC drive device 22 for receiving or providing a second mechanical torque. The third mechanical terminal 36 is mechanically coupled to the load 23 for providing or receiving a third mechanical torque. In some embodiments, the power split device 19 includes one or more gears 35 for transmitting mechanical torques provided by the AC traction system 15 to the load 23.

[0032] In some embodiments, when the propulsion system is driving a heavy load, the first mechanical terminal 32 receives a first mechanical torque from the first AC drive device 20, the second mechanical terminal 34 receives a second mechanical torque from the second AC drive device 22, and the third mechanical terminal 36 provides a third mechanical torque to the load 23. The third mechanical torque is a combination of the first mechanical torque and the second mechanical torque by the power split device 19.

[0033] In some embodiments, when the propulsion system is operated in a regenerative or braking mode, the third mechanical terminal 36 receives a third mechanical torque from the load

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23, the first mechanical terminal 32 provides a first mechanical torque to the first AC drive device 20, and the second mechanical terminal 34 provides a second mechanical torque to the second AC drive device 22. The first mechanical torque and the second mechanical torque are split from the third mechanical torque by the power split device 19. Then the first mechanical torque and the second mechanical torque may be converted into electric power by the AC traction system 15 for charging the ESS 11.

[0034] In some embodiments, when the propulsion system is driving a light load, the first mechanical terminal 32 receives a first mechanical torque from the first AC drive device 20, the second mechanical terminal 34 provides a second mechanical torque to the second AC drive device 22, and the third mechanical terminal 36 provides a third mechanical torque to the load 23. The second mechanical torque and the third mechanical torque are split from the first mechanical torque by the power split device 19. Then the second mechanical torque may be converted into electric power by the second AC drive device 22 for charging the ESS 11.

[0035] In some embodiments, the electric drive system 50 may include an optional transmission device 21. The transmission device 21 may be mechanically coupled between the AC traction system 15 and the power split device 19 for matching the output speed of the AC traction system 15 with the electric drive system speed.

[0036] In some embodiments, the transmission device 21 may be mechanically coupled between the first AC drive device 20 and the first mechanical terminal 32 of the power split device 19. In some embodiments, the transmission device 21 may be mechanically coupled between the second AC drive device 22 and the second mechanical terminal 34 of the power split device 19. In some embodiments, the transmission device 21 may be eliminated when the output speed of the AC traction system 15 meets requirements of the propulsion system.

[0037] The weight, size, and cost of the electric drive system may be decreased by selecting appropriate energy storage units, appropriate AC drive devices, and an appropriate combination of the energy storage units and the AC drive devices.

[0038] In some embodiments, the ESS 11 may include a battery and another battery used as the first energy storage unit 12 and the second energy storage unit 14, respectively. In some embodiments, the ESS 11 may include a battery and an ultra-capacitor used as the first energy

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storage unit 12 and the second energy storage unit 14, respectively. In some embodiments, the ESS 11 may include other kinds of energy source such as a flywheel battery.

[0039] In some embodiments, the AC traction system 15 may include an induction motor (IM) and another IM used as the first AC drive device 20 and the second AC drive device 22, respectively. In some embodiments, the AC traction system 15 may include an IM and an interior permanent motor (IPM) used as the first AC drive device 20 and the second AC drive device 22, respectively. In some embodiments, the AC traction system 15 may include other kinds of AC motor.

[0040] FIG. 3 illustrates a diagram of an electric drive system 100 applied in an EV system (not shown) in accordance with an exemplary embodiment of the present disclosure. The electric drive system 100 includes an ESS 102, a power conversion system 104, an AC traction system 106, an EMS 108, a power split device 122, and a transmission device 119.

[0041] In some embodiments, the ESS 102 includes a battery 101 and an ultra-capacitor 103. The AC traction system 106 includes a first AC drive device 116 and a second AC drive device 118. The first AC drive device 116 includes a first DC/AC inverter 111 and an IM 115. The second AC drive device 118 includes a second DC/AC inverter 113 and an IPM 117. In some embodiments, a single power conversion device 107 is used which has been described in detail in the power conversion device 18 shown in FIG. 1.

[0042] Several power flow paths may be formed in the electric drive system 100. In some embodiments, the battery 101 may be enabled to deliver electric power through the power conversion system 104, which in turn provides converted electric power to at least one of the IM 115 and the IPM 117, thereby at least a first power flow path is formed. In some embodiments, the ultra-capacitor 103 may be enabled to deliver electric power through the power conversion system 104, which in turn provides converted electric power to at least one of the IM 115 and the IPM 117, thereby at least a second power flow path is formed.

[0043] In some embodiments, the mechanical torques of at least one of the IM 115 and the IPM 117 firstly are converted into electric power and then the electric power may be delivered through the power conversion system 104 for charging at least one of the battery 101 and the ultra-capacitor 103, thereby at least a third power flow path is formed. In some embodiments,

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the battery 101 may deliver electric power through the pre-charging switching device 105 for charging the ultra-capacitor 103, thereby at least a fourth power path is formed.

[0044] A flexible charging strategy can be implemented to charge at least one of the battery 101 and the ultra-capacitor 103. For example, in some embodiments, the ultra-capacitor 103 can be charged with electric power generated from the IM 115 and converted by the single power conversion device 107. This is different from the prior charging strategy that charging the ultra-capacitor 103 through the use of pre-charging switching device 105. In some embodiments, the EMS 108 may be configured to implement a decoupling algorithm for controlling the IM 115 and the IPM 117 separately.

[0045] FIG. 4 illustrates a diagram of an electric drive system 200 with a first power conversion device 207 and a second power conversion device 209 coupled in parallel applied in an EV system (not shown) in accordance with an exemplary embodiment of the present disclosure. In some embodiments, the power split device 121 may include one or more planetary sets 37 for transmitting mechanical torques provided by the AC traction system 106 to the load 123.

[0046] In some embodiments, the first power conversion device 207 includes a first terminal 231 and a third terminal 235. The second power conversion device 209 includes a second terminal 233 and a fourth terminal 237.

[0047] In some embodiments, electric power from IM 115 may be delivered to the ultra-capacitor 103 through the power conversion system 204 indirectly via the pre-charging switching device 105, and electric power from the IPM 117 may be delivered to the ultra-capacitor 103 through the power conversion system 204.

[0048] A decoupling control of the two AC motors 115, 117 may be managed by controlling the first power conversion device 207 and the second power conversion device 209 separately due to different output DC voltages at the third terminal 235 and the fourth terminal 237.

[0049] Several charging paths may be implemented for charging the ultra-capacitor 103. In some embodiments, the battery 101 may deliver electric power through the pre-charging switching device 105 for charging the ultra-capacitor 103. In some embodiments, the IM 115 may deliver electric power through the first power conversion device 207 and the pre-charging

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switching device 105 for charging the ultra-capacitor 103. In some embodiments, the IPM 117 may deliver electric power through the second power conversion device 209 for charging the ultra-capacitor 103. In some embodiments, at least a part of the mechanical torque provided from the IM 115 can be converted into electric power through the IPM 117 and the second power conversion device 209, so that the ultra-capacitor 103 can be charged.

[0050] FIG. 5 illustrates a diagram of an electric drive system 300 with a first power conversion device 307 and a second power conversion device 309 coupled in series applied in an EV system (not shown) in accordance with an exemplary embodiment of the present disclosure.

[0051] The first power conversion device 307 includes a first terminal 331, a second terminal 333, and a third terminal 335. In some embodiments, the third terminal 335 is electrically coupled to the second AC drive device 118 and the second power conversion device 309. The second power conversion device 309 includes an input terminal 337 electrically coupled to the third terminal 335 of the first power conversion device 307, and an output terminal 339 electrically coupled to the first AC drive device 116. In some embodiments, the power flow paths may also be implemented in a flexible manner similar to what has been described with reference to FIG. 3.

[0052] A decoupling control of the IM 115 and the IPM 117 may be achieved by controlling the first power conversion device 307 and the second power conversion device 309 separately due to different output DC voltages at the third terminal 335 and the output terminal 339.

[0053] In some embodiments, the second power conversion device 309 is coupled to the second AC drive device 118. In some embodiments, the power conversion system 304 may include more separate power conversion devices and a flexible manner in connecting these separate power conversion devices.

[0054] FIG. 6 illustrates a flowchart of an energy management method 600 for controlling power flow in an electric drive system in accordance with an exemplary embodiment. At least some blocks of the method 600 may be programmed with software instructions stored in a computer-readable storage medium which, when executed by a processor, perform various steps of the method 600. The computer-readable storage medium may include volatile and nonvolatile, removable and non-removable media implemented in any method or technology. The computer-readable storage medium includes, but is not limited to, RAM, ROM, EEPROM, flash memory

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or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other non-transitory medium which may be used to store the desired information and which may be accessed by an instruction execution system.

[0055] In some embodiments, the method 600 may start at block 601, when a measured electric drive system speed V_{speed} is received. Then the process goes to block 603, in some embodiments, a required power P_{req} is calculated by a total torque request signal T_{total} and V_{speed}. Then the process goes to block 605.

[0056] At block 605, a determination is made to enable at least one of the first AC drive device 20 and the second AC drive device 22 based at least in part on V_{speed}. In some embodiments, the propulsion system may be operated in a normal mode based at least in part on V_{speed}. The normal mode may include a starting mode, an accelerating or uphill mode, a cruising mode, and a regenerative or braking mode. In some embodiments, the propulsion system may be operated in a fault-tolerate mode according to measured current signals or voltage signals.

[0057] In some embodiments, the operating AC drive device and an operating manner (e.g., motor, generator) of the AC motor in the AC drive device are determined based at least in part on the operating mode and P_{req}. If both of the first AC drive device 20 and the second AC drive device 22 are enabled, the process goes to 607, if not, the process goes to 609.

[0058] At block 607, several optimization algorithms may be implemented in a torque distribution unit for distributing the total torque request signal T_{total} into a first torque command signal and a second torque command signal. The first torque command signal is provided to the first AC drive device 20 and the second torque command signal is provided to the second AC drive device 22. Then the process goes to block 609.

[0059] At block 609, a determination is made to enable at least one of the first energy storage unit 12 and the second energy storage unit 14 based at least in part on the operating AC drive device and the structure of the power conversion system. In some embodiments, the operating manner (e.g., charger, discharger) of the first and second energy storage units is determined.

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[0060] In some embodiments, a principle for determining the operating energy storage unit is that the first energy storage unit 12 is operated as a primary power supplier, the second energy storage unit 14 is operated as an assistant. In some embodiments, the first energy storage unit 12 provides power to the first AC drive device 20 and the second energy storage unit 14 provides power to the second AC drive device 22.

[0061] In some embodiments, the second energy storage unit 14 provides an additional power when P_{req} rapidly that the first energy storage unit 12 alone may fail to provide the required power P_{req} due to a limitation of its charge/discharge characteristic. In some embodiments, when the second energy storage unit 14 fails to provide the additional power, the first energy storage unit 12 can be relied on to provide the needed power.

[0062] In some embodiments, the power provided by the first AC drive device 20 and the second AC drive device 22 may be partly used to charge the second energy storage unit 14 when the propulsion system is operated in a regenerative or braking mode. Then the process goes to block 611.

[0063] At block 611, power control signals 171 based at least in part on the enabled AC drive device and the enabled energy storage unit is determined for controlling power converting process. The power control signals 171 may be obtained by the description below.

[0064] The electric power may be generated from the ESS 11 and provided to the AC traction system 15. In some embodiments, a first input power received by the first terminal 24 may be converted into a first output power at the third terminal 28 and a second output power at the fourth terminal 30.

[0065] In some embodiments, a second input power received by the second terminal 26 may be converted into another first output power at the third terminal 28 and another second output power at the fourth terminal 30.

[0066] In some embodiments, a first input power received by the first terminal 24 and a second input power received by the second terminal 26 are converted into another first output power at the third terminal 28 and another second power at the fourth terminal 30.

[0067] Then electric power received by the third terminal 28 and the fourth terminal 30 are selectively provided to the AC traction system 15 based on the operating AC drive device.

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[0068] The electric power may be generated from the AC traction system 15 and be used to charge the ESS 11. In some embodiments, when the first AC motor in the first AC drive device 20 is operated as a generator, the electric power generated from the first AC drive device 20 may be used to charge the ESS 11. The electric power can be delivered to the second energy storage unit 14 through the power conversion device 18 directly or through the pre-charging device 16 via the power conversion device 18 indirectly.

[0069] In some embodiments, when the second AC motor in the second AC drive device 22 is operated as a generator, the electric power generated from the second AC drive device 22 may be delivered to the ESS 11 through the power conversion device 18 directly.

[0070] In some embodiments, when the first AC motor in the first AC drive device 20 is enabled as a motor and the second AC motor in the second AC drive device 22 is enabled as a generator, the mechanical torque from the first AC drive device 20 may be split by the power split device 19 into a first mechanical torque and a second mechanical torque. The first mechanical torque is supplied to the load 23, and the second mechanical torque is converted to an electric power for charging the second storage unit 14 through the power conversion device 18.

[0071] In some embodiments, the power generated from the first energy storage unit 12 may be delivered to the second energy storage unit 14 through the pre-charging switching device 16. Then the process goes to block 613. At block 613, the power control signals 171 is used to control the power flow among the energy storage system 11, the power conversion system 13 and the AC traction system 15. Then the process goes to block 615, torque control signals 173 are provided to the AC traction system 15 for outputting desired torques for driving the load 23.

[0072] The process described above may be modified in a variety of ways. In some embodiment, an additional block may be included before block 601, at the additional block, a determination is made to ascertain whether a pre-charging process should be enabled according to a current, a voltage or a power P_{esu2} of the second storage unit 14. In some embodiments, when $P_{esu2} < P_2$ (where P_2 is a predetermined value which represents a threshold that the second energy storage unit needs to be charged), the pre-charging process is enabled. Otherwise, the pre-charging process is disabled.

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[0073] In some embodiments, the pre-charging process function is initiated before the propulsion system is enabled. The pre-charging process includes charging the second energy storage unit 14 from the first energy storage unit 12 through the pre-charging switching device 16 which may ensure that the second energy storage unit 14 can provide enough power quickly when needed. Then the process goes to block 601.

[0074] FIG. 7 illustrates a flowchart of determining whether both of the first AC drive derive and the second AC drive device are enabled shown in FIG. 6 in an EV system in accordance with an exemplary embodiment of the present disclosure. The detailed illustration is based on the structure shown in FIG. 3. However, a person having ordinary skills in the art may apply the method disclosed herein to other propulsion systems.

[0075] In some embodiments, the flowchart 700 may start at block 701, if the EV system fails, at least one of the measured current signals or the voltage signals exceeds predetermined value, the EV system is operated in a fault-tolerate mode as shown at block 705. Otherwise, the EV system is operated in a normal mode as shown at block 703.

[0076] When the EV system is operated in the fault-tolerate mode, at least one of the battery 101, ultra-capacitor 103, IM 115, and IPM 117 fails. The normal parts may be reconfigured as a simplified electric drive system.

[0077] In some embodiments, one of the battery 101 and ultra-capacitor 103 with both of the IM 115 and IPM 117 are reconfigured. In some embodiments, both of the battery 101 and ultra-capacitor 103 with one of the IM 115 and IPM 117 are reconfigured. In some embodiments, one of the battery 101 and ultra-capacitor 103 with one of the IM 115 and IPM 117 are reconfigured. Therefore, the EV system may be allowed to stop in a safe way in the fault-tolerate mode with a fault-tolerant capability and reliability.

[0078] When the EV system is operated in the normal mode, after receiving a vehicle speed V_{speed} 707 and calculating P_{req} with V_{speed} and T_{total} 709, the process goes to four branches 702, 704, 706, and 708. The four branches will determine the operating AC motor and the operating manner. Index {1} is used to indicate that the IM 115 is enabled, index {2} is used to indicate that the IPM 117 is enabled, and index {1, 2} is used to indicate that both of the IM 115 and IPM 117 are enabled.

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[0079] At branch 702, the EV system is operated in a starting mode 711 when V_{speed} increases from about 0. In the starting mode, a determination is made to ascertain whether the IPM 117 can meet P_{req} 719, if yes, the process goes to block 723, in which the IPM 117 is enabled as a motor for providing necessary mechanical torque to meet P_{req}. If not the process goes to block 725, in which the IM 115 is enabled as a motor is enabled as a motor for providing necessary mechanical torque to meet P_{req}.

[0080] At branch 704, the EV system is operated in an accelerating or uphill mode 713 when V_{speed} changes with a sudden increase over a period of time. In the accelerating or uphill mode, the process goes to block 727, in which the IM 115 and IPM 117 are enabled as a motors for providing necessary mechanical torques to meet P_{req}.

[0081] At branch 706, the EV system is operated in a cruising mode 715 when V_{speed} fluctuates within a scope of a small range. In the cruising mode, the process goes to block 729, in which at least one of the IM 115 and IPM 117 is enabled as a motor for providing necessary mechanical torque to meet P_{req}.

[0082] At branch 708, the EV system is operated in a regenerative or braking mode 717 when V_{speed} changes with a sudden decrease over a period of time. In the regenerative or braking mode, the process goes to block 731, in which both of the IM 115 and IPM 117 are enabled as generators.

[0083] FIG. 8 illustrates a flowchart of calculating two torque control signals through a torque distribution unit shown in FIG. 6 in an EV system in accordance with an exemplary embodiment of the present disclosure. At block 801, at least one signal such as T_{total} is received. At block 803, a first AC motor torque signal referred to as "$M_{torque1}$" and a second AC motor torque signal referred to as "$M_{torque2}$" are received. At block 805, a first AC motor speed signal referred to as "M_{speed1}" and a second AC motor speed signal referred to as "M_{speed2}" are received.

[0084] At block 807, a first torque command signal referred to herein as "$T_{torque1}$" and a second torque command signal referred to herein as "$T_{torque2}$" are calculated through a torque distribution unit. The torque distribution unit may be embodied as software which may be

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implemented by the EMS 17 described above. In some embodiments, T_{total} may be provided by either the first AC motor (e.g., IM 115) or the second AC motor (e.g., IPM 117) or both the first and second AC motors with an appropriate torque distribution algorithm.

[0085] In some embodiments, $T_{torque1}$ and $T_{torque2}$ may be calculated through a fixed proportion algorithm which is based at least in part on torque providing capability of the first and second AC motors as shown in FIG. 9. Waveforms 901 and 905 show the torque providing capability of the first and second AC motors (e.g., IM 115 and IPM 117). In an embodiment, one of the first and second AC motors can meet the requirement of T_{total}, if not, the other AC motor will work to provide an additional torque according to the following equations:

$$a\,T_{torque1} = T_{total}\ (0 \le a \le 1)\quad (1),$$

$$b\,T_{torque2} = T_{total}\ (0 \le b \le 1)\quad (2),$$

$$a + b = 1 \qquad (3).$$

[0086] Where a and b are two variables, in some embodiments, a and b may include a group of fixed values. When $a = 0, b = 1$, the first AC motor 115 itself provides T_{total}, when $a = 1, b = 0$, the second AC motor 117 itself provides T_{total}. In some embodiments, a and b may include several groups of fixed values, so that an optimal torque distribution method can be implemented.

[0087] In some embodiments, T_{total} may be distributed to an average torque referred herein as "$T_{average}$" and a peak torque referred herein as "T_{peak}". $T_{torque1}$ and $T_{torque2}$ are equal to $T_{average}$ and T_{peak} respectively. For example, a peak torque is needed, in particular, with a sudden acceleration. In an embodiment,one of the first and second AC motors can provide the peak torque in a quick and stable response.

[0088] As shown in FIG. 9, the first AC motor can provide a large torque within a narrow speed range and the second AC motor can provide a smaller torque with a quick response within a wide speed range. In some embodiments, the second AC motor is used as an assistant which can work on and off. Basically, the algorithm is according to the following equations:

$$T_{total} = T_{average} + T_{peak} \quad (4),$$

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$$T_{torque1} = T_{average} \quad (5),$$

$$T_{torque2} = T_{peak} \quad (6).$$

[0089] In some embodiments, $T_{torque1}$ and $T_{torque2}$ may be calculated through an algorithm of maximizing the system efficiency according to the high efficiency areas 903, 907 of the first and second AC motors shown in FIG. 9. In an embodiment,both the first and second AC motors can work in their own high efficiency areas by using the second AC motor to assist the first AC motor. In some embodiments, the transmission device 21 is used to change the operating point which can be implemented by changing M_{speed1} (e.g., waveforms 913, 915).

[0090] In some embodiments, when M_{speed1} and M_{speed2} are fixed values, the operating points of the first and second AC motors may move along with waveforms 909, 911 within the scope of the high efficiency areas 903, 907. Thereby the total loss can be minimized. The algorithm may be determined according to the following equations:

$$T_{torque1} + T_{torque2} = T_{total} \quad (7),$$

$$P_{loss1} + P_{loss2} = min \quad (8).$$

[0091] Where P_{loss1} and P_{loss2} are power loss of the first and second AC motors respectively. This method functions through checking a look up table defining high efficiency areas of the two AC motors according to efficiency maps of each AC motor in the first AC drive device 20 and the second AC drive device 22 for reducing the total loss based at least in part on the motor speeds M_{speed1} and M_{speed2}.

[0092] FIG. 10 illustrates a flowchart of enabling at least one of the first energy storage unit and the second energy storage unit is enabled shown in FIG. 6 in accordance with an exemplary embodiment of the present disclosure. P_{req} is used to represent a required power, P_{bat} is used to represent a power provided by the battery 101, P_{uc} is used to represent a power provided by the ultra-capacitor 103, $P_{bat(threshold)}$ is used to represent an upper limit power provided by the battery 101, $P_{uc(threshold)}$ is used to represent an upper limit power provided by the ultra-capacitor 103, and $P_{uc(charging)}$ is used to represent a required charging power of the ultra-capacitor 103.

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[0093] At block 1001, P_{req} and motor index are received. Then process goes to block 1003, a determination is made to ascertain which branch the process will go. The process goes to block 1005 when receiving index {1} or index {1, 2}. Otherwise, the process goes to block 1007 when receiving index {2}.

[0094] At block 1005, if P_{req} is larger than P_{bat}, the process goes to block 1009. Otherwise, the process goes to block 1011 in which the battery 101 provides the power. At block 1009, if $P_{uc(threshold)}$ is larger than an additional power $P_{req} - P_{bat(threshold)}$, the process goes to block 1013 that the battery 101 provides the upper limit power itself and the ultra-capacitor 103 provides the additional power.

[0095] At block 1007, if P_{req} is larger than $P_{uc(threshold)}$, the process goes to block 1017. Otherwise, the process goes to block 1019 that the ultra-capacitor 103 provides the power. At block 1017, if the ultra-capacitor 103 requires to be charged, the process goes to 1021 that the ultra-capacitor 103 receives the required charging power $P_{uc(charging)}$, and the battery 101 provides both the required power P_{req} and the required charging power of the ultra-capacitor 103 $P_{uc(charging)}$. Otherwise, the process goes to block 1023 that the ultra-capacitor 103 provides the upper limit power itself and the battery provides the additional power.

[0096] As will be understood by those familiar with the art, the present invention may be embodied in other specific forms without depending from the spirit or essential characteristics thereof. Accordingly, the disclosures and descriptions herein are intended to be illustrative, but not limiting, of the scope of the invention which is set forth in the following claims.

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CLAIMS

What is claimed is:

1. An electric drive system, comprising:

an energy storage system (ESS), comprising:

a first energy storage unit configured for providing or receiving a first power; and

a second energy storage unit configured for providing or receiving a second power;

a power conversion system electrically coupled to the ESS for converting an input power to an output power, wherein the power conversion system comprises a power conversion device, wherein the power conversion device comprises:

a first terminal electrically coupled to the first energy storage unit;

a second terminal electrically coupled to the second energy storage unit;

a third terminal; and

a fourth terminal;

an alternating current (AC) traction system electrically coupled to the power conversion system for converting the output power of the power conversion system to mechanical torques, wherein the AC traction system comprises:

a first AC drive device coupled to the third terminal of the power conversion device for providing or receiving a first mechanical torque; and

a second AC drive device coupled to the fourth terminal of the power conversion device for providing or receiving a second mechanical torque; and

an energy management system (EMS) in communication with the ESS, the AC traction system, and the power conversion system for providing control signals.

2. The electric drive system of claim 1, wherein the power conversion system further comprises:

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a pre-charging switching device electrically coupled between the first energy storage unit and the second energy storage unit for selectively providing a power flow path between the first energy storage unit and the second energy storage unit.

3. The electric drive system of claim 2, wherein the pre-charging switching device is a unidirectional switching device for providing a unidirectional power flow path for charging the second energy storage unit.

4. The electric drive system of claim 1, wherein the power conversion device is a single power conversion device.

5. The electric drive system of claim 1, wherein the power conversion device further comprises:

a first power conversion device, the first power conversion device is electrically coupled to the first energy storage unit through the first terminal and electrically coupled to the first AC drive device through the third terminal; and

a second power conversion device coupled in parallel with the first power conversion device, the second power conversion device is electrically coupled to the second energy storage unit through the second terminal and electrically coupled to the second AC drive device through the fourth terminal.

6. The electric drive system of claim 1, wherein the power conversion device further comprises:

a first power conversion device electrically coupled to the first energy storage unit through the first terminal and electrically coupled to the second energy storage unit through the second terminal, and electrically coupled to the second AC drive device through the fourth terminal; and

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a second power conversion device coupled in series with the first power conversion device, the second power conversion device is electrically coupled to the first AC drive device through the third terminal.

7. The electric drive system of claim 1, wherein the first AC drive device comprises:

at least one of an induction motor (IM) and an interior permanent motor (IPM) operated as a first AC motor; and

a first DC/AC inverter electrically coupled to the first AC motor for providing AC power to the first AC motor,

wherein the second AC drive device comprises:

at least one of the IM and the IPM operated as a second AC motor; and

a second DC/AC inverter electrically coupled to the second AC motor for providing AC power to the second AC motor.

8. The electric drive system of claim 1, wherein:

the first AC drive device is configured to independently provide the first mechanical torque to a first load; and

the second AC drive device is configured to independently provide the second mechanical torque to a second load.

9. The electric drive system of claim 1, further comprising a power split device mechanically coupled between the AC traction system and a load wherein the power split device comprises:

a first mechanical terminal mechanically coupled to the first AC drive device for receiving a first mechanical torque provided from the first AC drive device;

a second mechanical terminal mechanically coupled to the second AC drive device for receiving a second mechanical torque provided from the second AC drive device; and

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a third mechanical terminal mechanically coupled to the load for providing a third mechanical torque to the load, the third mechanical torque is a combination of the first mechanical torque and the second mechanical torque by the power split device.

10. The electric drive system of claim 9, wherein the power split device is configured for splitting a third mechanical torque into a first mechanical torque and a second mechanical torque, wherein:

the third mechanical terminal is configured for receiving the third mechanical torque from the load;

the first mechanical terminal is configured for providing the first mechanical torque which is converted into electric power for charging the ESS; and

the second mechanical terminal is configured for providing the second mechanical torque which is converted into electric power for charging the ESS.

11. The electric drive system of claim 9, wherein the power split device is configured for splitting a first mechanical torque into a second mechanical torque and a third mechanical torque, wherein:

the first mechanical terminal is configured for receiving the first mechanical torque provided from the first AC drive device;

the second mechanical terminal is configured for providing the second mechanical torque to the second AC drive device and converting the second mechanical torque into electric power for charging the ESS; and

the third mechanical terminal is configured for providing the third mechanical torque to the load.

12. The electric drive system of claim 9, further comprising:

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a transmission device mechanically coupled between the AC traction system and the power split device for matching output speed of the AC traction system with an electric drive system speed.

13. An energy management method, comprising:

enabling at least one of a first AC drive device and a second AC drive device based at least in part on an electric drive system speed signal;

enabling at least one of a first energy storage unit and a second energy storage unit; and

sending power control signals to a power conversion system for controlling power flow paths in an electric drive system, wherein controlling the power flow paths comprises:

receiving or providing at least one input power by at least one of a first terminal and a second terminal of the power conversion system; and

providing or receiving at least one output power by at least one of a third terminal and a fourth terminal of the power conversion system.

14. The method of claim 13, wherein controlling the power flow paths further comprises:

converting an electric power generated from an energy storage system (ESS) into a first mechanical torque by the first AC drive device;

splitting the first mechanical torque into a second mechanical torque and a third mechanical torque;

providing the second mechanical torque to the second AC drive device and converting the second mechanical torque into electric power for charging a second energy storage unit; and

providing the third mechanical torque to the load.

15. The method of claim 13, further comprising:

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calculating a first torque command signal and a second torque command signal through a torque distribution unit; and

sending the first torque command signal and the second torque control signal to the first AC drive device and the second AC drive device, respectively.

16. The method of claim 13, further comprising:

determining an operating mode of a propulsion system based at least in part on the electric drive system speed, wherein the operating mode comprises:

a normal mode comprising a starting mode, an accelerating, a cruising mode, and a braking mode; and

a fault-tolerate mode.

17. The method of claim 16, further comprising one of the following:

enabling at least one of the first AC drive device and second AC drive device and at least one of the first energy storage unit and second energy storage unit in the fault-tolerate mode;

enabling the second AC drive device when a required power P_{req} is within the ability of the second AC drive device in the starting mode;

enabling the first AC drive device when P_{req} exceeds the ability of the second AC drive device in the starting mode;

enabling both of the first AC drive device and second AC drive device in the accelerating mode;

enabling at least one of the first AC drive device and second AC drive device in the cruising mode; and

enabling both of the first AC drive device and second AC drive device in the braking mode.

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18. The method of claim 15, wherein the torque distribution unit comprises a torque distribution algorithm with a look up table defining high efficiency areas of two AC motors according to efficiency maps of each AC motor in the first AC drive device and the second AC drive device for reducing total loss.

19. The method of claim 18, further comprising changing an operating point of the first AC drive device through a transmission device for optimizing the torque distribution algorithm.

20. The method of claim 13, further comprising:

enabling the second energy storage unit as an assistant to provide additional power when the first energy storage unit fails to provide a required power.

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ELECTRIC DRIVE SYSTEM AND ENERGY MANAGEMENT METHOD

ABSTRACT

An electric drive system includes an energy storage system (ESS), a power conversion system, and an alternating current (AC) traction system. The ESS provides or receives electric power. The ESS includes a first energy storage unit and a second energy storage unit. The power conversion system is electrically coupled to the ESS for converting an input power to an output power. The AC traction system is electrically coupled to the power conversion system for converting the output power of the power conversion system to mechanical torques. The AC traction system includes a first AC drive device and a second AC drive device. An energy management system (EMS) is in electrical communication with the ESS, the AC traction system, and the power conversion system for providing control signals.

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