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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/283,137	11/17/2005	Martin Koebler	5438.00300

82328
Maiorana, PC - Invently
24840 Harper Ave.
Suite 100
St Clair Shores, MI 48080

CONFIRMATION NO. 3291
POWER OF ATTORNEY NOTICE



Date Mailed: 10/18/2018

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/02/2018.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71.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.

/tmwilliams/



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/283,137	11/17/2005	Martin Koebler	5438.00300

CONFIRMATION NO. 3291

POA ACCEPTANCE LETTER



OC000000103171429

141471

Maiorana, PC - Invently Automotive

24840 Harper

Suite 100

St. Clair Shores, MI 48080

Date Mailed: 10/18/2018

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/02/2018.

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.

/tmwilliams/

From:Maiorana PC

To:POA

10/02/2018 11:33

#529 P.001/002

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OCT 02 2018

LAW OFFICES
CHRISTOPHER P. MAIORANA, P.C.
24840 HARPER AVENUE, SUITE 100
ST. CLAIR SHORES, MICHIGAN 48080

CHRISTOPHER P. MAIORANA
ROBERT M. MILLER
JOHN J. IGNATOWSKI

(586) 498-0670
Fax (586) 498-0673
maioranapc.com

PATENTS, TRADEMARKS
& COPYRIGHTS

FACSIMILE MESSAGE

TO: _____
COMPANY: United States Patent and Trademark Office
RE: Serial No. 11/283,137 - Filed: 11/17/05 - Patent No. 7,925,426 - Issued: 04/12/11
FILE NO.: 5438.00300
FAX NO.: 571-273-8300
FROM: Christopher P. Maiorana
DATE: October 2, 2018 TIME: _____
TOTAL NUMBER OF PAGES 2 (including cover sheet)

If you do not receive any of these pages, please telephone us at (586) 498-0670 or telefax us at (586) 498-0673.

COMMENTS:

ATTACHED: POWER OF ATTORNEY BY APPLICANT (1 page).

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PTO/AIA/82B(07-12)

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- ☒ 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):

141471

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 1.48(b)(2) was granted in the application or is concurrently being filed with this document)

SIGNATURE of Applicant for Patent

Signature	<i>Greg Martin</i>	Date	July 19, 2017
Name	Greg Martin	Telephone	880-450-0578
Title and Company Chief Executive Officer, Inventry Automotive Inc.			

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 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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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/283,137	11/17/2005	Martin Koebler	5438.00300

CONFIRMATION NO. 3291

MISCELLANEOUS NOTICE



82328
Christopher P. Maiorana, P.C.
24840 Harper Ave.
Suite 100
St Clair Shores, MI 48080

Date Mailed: 08/08/2017

A communication which cannot be delivered in electronic form has been mailed to the applicant.



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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/283,137	11/17/2005	Martin Koebler	5438.00300

CONFIRMATION NO. 3291

82328
 Christopher P. Maiorana, P.C.
 24840 Harper Ave.
 Suite 100
 St Clair Shores, MI 48080



OC00000093286325

Cc: CHRISTOPHER P. MAIORANA, PC
 24840 HARPER
 SUITE 100
 ST. CLAIR SHORES, MI 48080

Date Mailed: 08/08/2017

DENIAL OF REQUEST FOR POWER OF ATTORNEY

The request for Power of Attorney filed 07/27/2017 is acknowledged. However, the request cannot be granted at this time for the reason stated below.

- ☐ The Power of Attorney you provided did not comply with the new Power of Attorney rules that became effective on June 25, 2004. See 37 CFR 1.32.
- ☐ The revocation is not signed by the applicant, the assignee of the entire interest, or one particular principal attorney having the authority to revoke.
- ☒ The Power of Attorney is from an assignee and the Certificate required by 37 CFR 3.73(c) has not been received.
- ☐ The person signing for the assignee has omitted their empowerment to sign on behalf of the assignee.
- ☐ The inventor(s) is without authority to appoint attorneys since the assignee has intervened as provided by 37 CFR 3.71.
- ☐ The signature(s) of Yong Seok Moon, a co-inventor in this application, has been omitted. The Power of Attorney will be entered upon receipt of confirmation signed by said co-inventor(s).
- ☐ The person(s) appointed in the Power of Attorney is not registered to practice before the U.S. Patent and Trademark Office.
- ☐ Only one Customer Number can be designated for the Power of Attorney in an application. The Customer Number that was captured is the first Customer Number provided on the Power of Attorney document.
- ☐ A request under 37 CFR 1.48 to add an inventor was granted in this application, however, no power of attorney consistent with the power of attorney granted by the originally named inventive entity has been received. Thus, the addition of the inventor has resulted in the loss of power of attorney in the application. See 37 CFR 1.32(e).



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- ☐ The power of attorney has not been accepted because the party who is giving power of attorney has not been identified. Power of attorney may only be signed by the applicant for patent (37 CFR 1.42) or the patent owner. A patent owner who was not the applicant must appoint any power of attorney in compliance with 37 CFR 3.71 and 3.73. See 37 CFR 1.32(b)(4).
- ☐ The power of attorney from the inventors has not been accepted because it is a copy from a prior national application for which benefit is claimed and the continuing application names an inventor who was not named as an inventor in the prior application.
- ☐ The power of attorney from the inventors has not been accepted because the power of attorney must be signed by the applicant for patent. See 37 CFR 1.32(b)(4).
- ☐ Any request to correct or update the name of the applicant must include an application data sheet (ADS) in compliance with 37 CFR 1.76 specifying the correct or updated name of the applicant in the applicant information section. Any request to change the applicant after an original applicant has been specified under 37 CFR 1.46(b) must include a new ADS in compliance with 37 CFR 1.76 specifying the applicant in the applicant information section and comply with 37 CFR 3.71 and 3.73. See 37 CFR 1.46(c).

Any inquiries regarding this notice should be directed to the Application Assistance Unit at 571-272-4200.

NH

Application Assistance Unit
 571-272-4200

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PTO/AIA/825(07-12)

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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):

141471

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):

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OR

- ☐ The address associated with Customer Number:

OR

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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	Date	
Name	Telephone	
Title and 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 1 forms are submitted.

This collection of information is required by 37 CFR 1.01, 1.02 and 1.03. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO in proper) an application. Confidentiality is governed by 35 U.S.C. 123 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 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-6199 and select option 2.

From: Maiorana PC

To: POA

07/27/2017 15:42

#302 P.001/002

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JUL 27 2017

LAW OFFICES
CHRISTOPHER P. MAIORANA, P.C.
24840 HARPER AVENUE, SUITE 100
ST. CLAIR SHORES, MICHIGAN 48080

CHRISTOPHER P. MAIORANA
ROBERT M. MILLER
JOHN J. IGNATOWSKI

(586) 498-0670
Fax (586) 498-0673
maioranapc.com

PATENTS, TRADEMARKS
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FACSIMILE MESSAGE

TO: _____
COMPANY: United States Patent and Trademark Office
RE: Serial No. 11/283,137 - Filed: November 17, 2005
FILE NO.: 5438.00300
FAX NO.: 571-273-8300
FROM: Christopher P. Maiorana
DATE: July 27, 2017 TIME: _____
TOTAL NUMBER OF PAGES 2 (including cover sheet)

If you do not receive any of these pages, please telephone us at (586) 498-0670 or telefax us at (586) 498-0673.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/283,137	11/17/2005	Martin Koebler	5438.00300

82328
Christopher P. Maiorana, P.C.
24840 Harper Ave.
Suite 100
St Clair Shores, MI 48080

CONFIRMATION NO. 3291
IMPROPER CPOA LETTER



Date Mailed: 06/12/2017

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the power of attorney filed 06/05/2017. The power of attorney in this application is not accepted for the reason(s) listed below:

- The power of attorney is from an assignee and the statement required by 37 CFR 3.73(c) has not been received.

/sstephanos/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

From:Maiorana PC

To:POA

06/05/2017 14:46

#273 P.002/002

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JUN 05 2017

PTO/AIA/825(07-12)

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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):

82328

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

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OR

- ☐ The address associated with Customer Number:

OR

☐ Firm or
Individual Name

Address

City

State

Zip

Country

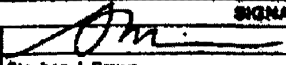
Telephone

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 1.48(b)(2) was granted in the application or is concurrently being filed with this document)

SIGNATURE of Applicant for Patent

Signature		Date	6/18/13
Name	Stephen J. Brown	Telephone	650-503-3385
Title and Company	President, Invently, LLC		

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 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.

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

From:Maiorana PC

To:POA

06/05/2017 14:46

#273 P.001/002

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JUN 05 2017

LAW OFFICES
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CHRISTOPHER P. MAIORANA
ROBERT M. MILLER
JOHN J. IGNATOWSKI

(586) 498-0670
Fax (586) 498-0673
maioranapc.com

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FACSIMILE MESSAGE

TO: _____
COMPANY: United States Patent and Trademark Office
RE: Serial No. 11/283,137 - Filed: 11/17/05 - Patent No. 7,925,426 - Issued: 4/12/11
FILE NO.: 5438.00300
FAX NO.: 571-273-8300
FROM: Christopher P. Maiorana
DATE: June 5, 2017 TIME: _____
TOTAL NUMBER OF PAGES 2 (including cover sheet)

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APPLICATION NUMBER	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
11/283,137	7925426	3661	9200



Correspondence Address/Fee Address Change

The following fields have been set to Customer Number 82328 on 01/09/2014

- Correspondence Address
- Maintenance Fee Address

The address of record for Customer Number 82328 is:

82328
Christopher P. Maiorana, P.C.
24840 Harper Ave.
Suite 100
St Clair Shores, MI 94303

Receipt date: 12/10/2007

Modified Version of PTO/SB/08A (Substitute for Form 1449/PTO)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS				Application Number	11/283137
				Filing Date	11/17/2005
				First Named Inventor	Martin Koebler
				Art Unit	3661
				Examiner Name	Nguyen, Cuong H
Sheet	2	of	3	Attorney Docket Number	MTS-101AJS

US Patent Documents					
Examiner Initials	Cite No.	Document Number Number/Kind Code	Publication Date mm-dd-yyyy	Name	Relevant Information
	A	US- 4347496	08/31/1982	Kubalak et al.	
	B	US- 4459671	07/10/1984	Teass et al.	
	C	US- 5315977	05/31/1994	Fossen	
	D	US- 5929609	07/27/1999	Joy et al.	
	E	US- 5999864	12/07/1999	Thiel et al.	
	F	US- 6064937	05/16/2000	Yang	
	G	US- 6307277	10/23/2001	Tamai et al	
	H	US- 6370472	04/09/2002	Fosseen	
	I	US- 6427107	07/30/2002	Chiu et al	
	J	US- 6465908	10/15/2002	Karuppana et al	
	K	US- 6522955	02/18/2003	Colborn	
	L	US- 6662642	12/16/2003	Breed et al	
	M	US- 6701897	03/09/2004	Chatfield	
	N	US- 6809429	10/26/2004	Frank	
	O	US- 6838858	01/04/2005	Berneis et al	

Foreign Patent Documents						
Examiner Initials	Cite No.	Document Number Country/Number/Kind Code	Publication Date mm-dd-yyyy	Name	Relevant Information	T

Examiner	/Cuong Nguyen/ (04/15/2012)	Date Considered	
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* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.
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 USC 122 and 37 CFR 1.11 and 1.14.
SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /CHN/ (04/15/2012)

Receipt date: 12/10/2007

Modified Version of PTO/SB/08B (Substitute for Form 1449/PTO)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS		Application Number	11/283137
		Filing Date	11/17/2005
		First Named Inventor	Martin Koebler
		Art Unit	3661
		Examiner Name	Nguyen, Cuong H
Sheet	4	of	4
		Attorney Docket Number	MTS-101/US

Non Patent Literature Documents			
Examiner Initials	Cite No.	Name (IN CAPITALS), Title, Date, Pages, Volume-Issue, Publisher, City, Country	T
	A	HIBBS, "GM Sunraycer Case History/M101 lecture 2-2", 12/01/1990, pages 1-37, Society for Automotive Engineers, Inc., Warrendale, USA	
	B	CASSIDY et al, "GM Sunraycer Case History/M101 lecture 4-1", 12/01/1990, pages 1-61, Society for Automotive Engineers, Inc., Warrendale, USA	
	C	LOVINS et al, "Winning the Oil Endgame", 03/01/2005, page 50, Rocky Mountain Institute, Snowmass, USA	
	D	ROCHE et al, "The Speed of Light, The 1996 World Solar Challenge", 1997, pages 43-46 & 189-194, UNSW	
	E	"Answers.com", pages 1-7, Answers.com, http://www.answers.com/topic/drag-coefficient-1	
	F	"Cell Specification Data", pages 1-2, Kokam Co., Ltd., http://www.kokam.com/product/product_pdf/high_power/PL-301_SLPB60460330H_70Ah_Grade.pdf	
	G		

Examiner	/Cuong Nguyen/ (04/15/2012)	Date Considered	
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* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.
 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 USC 122 and 37 CFR 1.11 and 1.14.
 SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /CHN/ (04/15/2012)



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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/283,137	04/12/2011	7925426	MTS-101/US	3291

30869 7590 03/23/2011
LUMEN PATENT FIRM
350 Cambridge Avenue
Suite 100
PALO ALTO, CA 94306

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 1546 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):

Martin Koebler, Saal/Donau, GERMANY;
Nicole G. Goldstein, Woodside, CA;
Stephen J. Brown, Woodside, CA;
Jason H. Harper, Pleasanton, CA;



\$
CC

ISSUE FEE AND/OR PUBLICATION FEE TRANSMITTAL

This form is an equivalent of Part B of the Notice of Allowance and Fee(s) Due, and is in compliance with the requirement on how to reply to the Notice (Item II, Page 1 of Notice)

CURRENT CORRESPONDENCE ADDRESS			Certificate of Mailing or Transmission			
30869 .7590 2/16/2011			I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop ISSUE FEE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, or being facsimile transmitted to the USPTO (571) 273-2885, on the date shown below:			
LUMEN PATENT FIRM 350 CAMBRIDGE AVE SUITE 100 PALO ALTO, CA 94306			Robert Lodenkamper (Depositor's name)			
			/ Robert Lodenkamper / Reg.No. 55,399 (Signature)			
			2/24/11 (Date)			
Application No.	Filing Date	First Named Inventor	Docket No.	Confirmation No.		
11/283137	11/17/2005	Martin Koebler	MTS-101/US	3291		
Title: POWER MANAGEMENT SYSTEMS AND DESIGNS						
Appl. Type	Small Entity	Issue Fee Due	Pub. Fee Due	Prev. Paid IF	Total Fee Due	
nonprovisional	YES	755	\$300	\$0	\$1055	
Examiner		Art Unit	Class-SubClass			
Nguyen, Cuong H		3661	701/001			
1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363): ☐ Change of correspondence address attached. ☐ "Fee address" indication attached.			2. For printing on the patent front page list firm name: LUMEN PATENT FIRM			
3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT. Unless an assignee is identified below, no assignee 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 Motility Systems			(B) RESIDENCE (City and State or Country) Woodside, CA			
Please check the appropriate assignee category/categories: ☐ Individual ☒ Corporation or Private Group Entity ☐ Government						
4a. The following fee(s) are submitted: ☒ Issue Fee ☒ Publication Fee ☐ Advance Order - # of Copies _____			4b. Payment of fee(s): ☐ Check is enclosed ☒ Payment by credit card (form is attached) ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account No. _____ (enclose extra copy)			
5. Change in entity status (from previous established status) ☐ a. Applicant claims SMALL ENTITY status ☐ b. Applicant is no longer claiming SMALL ENTITY status						

SIGNATURE OF APPLICANT, REGISTERED ATTORNEY, OR REGISTERED AGENT			
SIGNATURE	/ Ron Jacobs / Reg.No. 50,142	DATE	2/24/11
PRINTED NAME	Ron Jacobs	REG. NO.	50,142

03/02/2011 EEKUBAY2 00000003 11283137 755.00 0P 300.00 0P
01 FC:2501
02 FC:1504



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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NOTICE OF ALLOWANCE AND FEE(S) DUE

30869 7590 02/16/2011
LUMEN PATENT FIRM
350 Cambridge Avenue
Suite 100
PALO ALTO, CA 94306

EXAMINER

NGUYEN, CUONG H

ART UNIT PAPER NUMBER

3661

DATE MAILED: 02/16/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/283,137	11/17/2005	Martin Koebler	MTS-101/US	3291

TITLE OF INVENTION: POWER MANAGEMENT SYSTEMS AND DEVICES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$300	\$0	\$1055	05/16/2011

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 SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

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.

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)

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.

30869 7590 02/16/2011
LUMEN PATENT FIRM
350 Cambridge Avenue
Suite 100
PALO ALTO, CA 94306

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.
11/283,137	11/17/2005	Martin Koebler	MTS-101/US	3291

TITLE OF INVENTION: POWER MANAGEMENT SYSTEMS AND DEVICES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$300	\$0	\$1055	05/16/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, CUONG H	3661	701-001000

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, 1 _____
(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. 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 credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
Typed or printed name _____ Registration No. _____

This collection of information 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.



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.
11/283,137	11/17/2005	Martin Koebler	MTS-101/US	3291

30869 7590 02/16/2011
LUMEN PATENT FIRM
350 Cambridge Avenue
Suite 100
PALO ALTO, CA 94306

EXAMINER

NGUYEN, CUONG H

ART UNIT	PAPER NUMBER
----------	--------------

3661

DATE MAILED: 02/16/2011

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

The Patent Term Adjustment to date is 933 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 933 day(s).

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 Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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.	Applicant(s)	
	11/283,137	KOEBLER ET AL.	
	Examiner	Art Unit	
	CUONG H. NGUYEN	3661	

-- 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 an interview on 1/30/2011.

2. ☒ The allowed claim(s) is/are 17, 20-22; they are renumbered as claims 1-4.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 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.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 (b) ☐ 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. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____ 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	5. ☐ Notice of Informal Patent Application 6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ . 7. ☐ Examiner's Amendment/Comment 8. ☒ Examiner's Statement of Reasons for Allowance 9. ☐ Other _____.
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/ CUONG H. NGUYEN/ Primary Examiner, Art Unit 3661	
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1. This Office Action is an answer for the Amendments to the Claims filed on 7/19/2010.
2. Claims 17, and 20-22 are pending, wherein claims 17, and 20-21 are currently amended.

Allowable subject matter

3. Pending claims 17, and 20-22 are patentable over two cited references of Matsubara et al., or Bauer et al., because these prior art do not make obvious a method of managing the power consumption of a vehicle, comprising:

- (a) a computer device receiving a route;
- (b) said computer device segmenting said route into segment destinations; and
- (c) said computer device for each of said segment destinations:
 - (i) calculating an optimized speed by minimizing power consumption over said segment destination, wherein information is (j) information about the external environment of a vehicle, (jj) information about the operational status of the vehicle, (jjj) one or more user command inputs, or (jv) one or more operational parameters of the vehicle are received as input to said calculating and analyzed by one or more processors;
 - (ii) calculating a probable speed;
 - (iii) determining an efficient speed based on said optimized speed and said probable speed, wherein the step of determining said efficient speed for the vehicle further comprises determining a historical speed for a similar destination; and
 - (iv) applying the calculated power corresponding to said determined

efficient speed to the vehicle engine to travel said segment
destination.

Conclusion

4. Claims 17, and 20-22 are allowed, they are renumbered as claims 1-4.
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CUONG H. NGUYEN whose telephone number is 571-272-6759 (email address: cuong.nguyen@uspto.gov). The examiner can normally be reached on 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, THOMAS G. BLACK can be reached on 571-272-6956. The Rightfax number for the organization where this application is assigned is 571-273-6956.

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).

/CUONG H. NGUYEN/
Primary Examiner
Art Unit 3661

Notice of References Cited	Application/Control No. 11/283,137		Applicant(s)/Patent Under Reexamination KOEBLER ET AL.	
	Examiner CUONG H. NGUYEN		Art Unit 3661	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2007/0112475	05-2007	Koebler et al.	701/001
*	B	US-2006/0005736	01-2006	Kumar, Ajith Kuttannair	105/001.4
*	C	US-2003/0015874	01-2003	Abe et al.	290/40.00C
*	D	US-2003/0015358	01-2003	Abe et al.	180/65.3
*	E	US-2003/0006914	01-2003	Todoriki et al.	340/995
*	F	US-2002/0195288	12-2002	Komiyama et al.	180/65.4
*	G	US-7,812,555	10-2010	Adra, Rodwan Tarek	318/376
*	H	US-7,715,958	05-2010	Kumar, Ajith Kuttannair	701/22
*	I	US-7,665,559	02-2010	De La Torre-Bueno, Jose	180/65.29
*	J	US-7,222,004	05-2007	Anderson, Noel Wayne	701/22
*	K	US-6,949,897	09-2005	Wakashiro et al.	318/139
*	L	US-6,814,170	11-2004	Abe et al.	180/65.25
*	M	US-5,650,931	07-1997	Nii, Yoshihide	701/22

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
*	N	DE 102006009710 A1	06-2007	Germany	CHUANG K et al.	
*	O	EP 1130415 A2	09-2001	European Patent	HASEGAWA, KOJI	
*	P	JP 2004012250 A	01-2004	Japan	YAMADA et al.	
*	Q	JP 2007155695 A	06-2007	Japan	KUNG et al.	
*	R	WO 2008053789 A1	05-2008	World Intellect	KUROKAWA Y	
*	S	JP 4543480 B2	09-2010	Japan	HASEGAWA K	
*	T	TW 200722778 A	06-2007	Taiwan	CHUANG K et al.	

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
*	U	Trip Based Power Management of Plug-in Hybrid Electric Vehicle with Two-Scale Dynamic Programming; Qiuming Gong; Yaoyu Li; Zhong-Ren Peng; Vehicle Power and Propulsion Conference, 2007. VPPC 2007. IEEE; Digital Object Identifier: 10.1109/VPPC.2007.4544089; Publication Year: 2007 , Page(s): 12 - 19
*	V	Traffic-Known Urban Vehicular Route Prediction Based on Partial Mobility Patterns; Guangtao Xue; Zhongwei Li; Hongzi Zhu; Yunhuai Liu; Parallel and Distributed Systems (ICPADS), 2009 15th International Conference on; Digital Object Identifier: 10.1109/ICPADS.2009.129; Publication Year: 2009 , Page(s): 369 - 375
*	W	An optimal control-based algorithm for Hybrid Electric Vehicle using preview route information; Dac Viet Ngo; Hofman, T.; Steinbuch, M.; Serrarens, A.F.A.; American Control Conference (ACC), 2010; Publication Year: 2010 , Page(s): 5818 - 5823
*	X	Computationally efficient optimal power management for plug-in hybrid electric vehicles based on spatial-domain two-scale dynamic programming; Qiuming Gong; Yaoyu Li; Zhong-Ren Peng; Vehicular Electronics and Safety, 2008. ICVES 2008. IEEE International Conference on; Digital Object Identifier: 10.1109/ICVES.2008.4640882; Publication Year: 2008

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 11/283,137	Applicant(s)/Patent Under Reexamination KOEHLER ET AL.	
	Examiner CUONG H. NGUYEN	Art Unit 3661	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-			
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
*	N	WO00/75682	12-2000	WIPO	KOVACS ET AL.	
*	O	WO2005/115787	12-2005	WIPO	HARADA ET AL.	
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
*	U	Assessing the Potential of Predictive Control for Hybrid Vehicle Powertrains Using Stochastic Dynamic Programming Lars Johannesson; Mattias Asbogard; Bo Egardt; Intelligent Transportation Systems, IEEE Transactions on Volume: 8 , Issue: 1; Digital Object Identifier: 10.1109/TITS.2006.884887; Publication Year: 2007 , Page(s): 71 - 83
*	V	Reduction of power consumption in sensor network applications using machine learning techniques; Shafiullah, G.M.; Thompson, A.; Wolfs, P.J.; Ali, S.; TENCON 2008 - 2008 IEEE Region 10 Conference; Digital Object Identifier: 10.1109/TENCON.2008.4766574; Publication Year: 2008 , Page(s): 1 - 6
*	W	Ultralight electric vehicle for urban mass transportation; Janach, W.; Vehicle Power and Propulsion Conference, 2008. VPPC '08. IEEE; Digital Object Identifier: 10.1109/VPPC.2008.4677405; Publication Year: 2008 , Page(s): 1 - 4
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes 	Application/Control No.		Applicant(s)/Patent under Reexamination	
	11/283,137		KOEHLER ET AL.	
	Examiner		Art Unit	
	CUONG H. NGUYEN		3661	

SEARCHED			
Class	Subclass	Date	Examiner
701	200,213	1/30/2011	CHN
701	54-56,101	1/30/2011	CHN
701	35-36	1/30/2011	CHN
73	115.01	1/30/2011	CHN
701	103-104	1/30/2011	CHN
180	65.26	1/30/2011	CHN

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner
701	103,123	1/30/2011	CHN
73	115.01	1/30/2011	CHN
G06F 19/00 G06G 7/70		1/30/2011	CHN

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
WEST/DERWENT frwd/bkwr searches on an allowable subject matter and closest cited references	1/30/2011	CHN
Inventors'names	1/30/2011	CHN
PG PUBS	1/30/2011	CHN
IEEE Xplore	1/30/2011	CHN

Issue Classification 	Application/Control No.	Applicant(s)/Patent under Reexamination	
	11/283,137	KOEHLER ET AL.	
	Examiner	Art Unit	
	CUONG H. NGUYEN	3661	

ISSUE CLASSIFICATION										
ORIGINAL					CROSS REFERENCE(S)					
CLASS		SUBCLASS			CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
701		123			701	213	103			
INTERNATIONAL CLASSIFICATION					73	115.01				
G	0	6	F	19/00	180	65.26				
G	0	6	G	7/70						
				/						
				/						
				/						

(Assistant Examiner) (Date)		/CUONG H NGUYEN/ 1/31/2011	Total Claims Allowed: 4	
(Legal Instruments Examiner) (Date)			O.G. Print Claim(s) 1	O.G. Print Fig. 1

☐ 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
	1		31		61		121		151		181
	2		32		62		122		152		182
	3		33		63		123		153		183
	4		34		64		124		154		184
	5		35		65		125		155		185
	6		36		66		126		156		186
	7		37		67		127		157		187
	8		38		68		128		158		188
	9		39		69		129		159		189
	10		40		70		130		160		190
	11		41		71		131		161		191
	12		42		72		132		162		192
	13		43		73		133		163		193
	14		44		74		134		164		194
	15		45		75		135		165		195
	16		46		76		136		166		196
1	17		47		77		137		167		197
	18		48		78		138		168		198
	19		49		79		139		169		199
2	20		50		80		140		170		200
3	21		51		81		141		171		201
4	22		52		82		142		172		202
	23		53		83		143		173		203
	24		54		84		144		174		204
	25		55		85		145		175		205
	26		56		86		146		176		206
	27		57		87		147		177		207
	28		58		88		148		178		208
	29		59		89		149		179		209
	30		60		90		150		180		210

Refine Search

Search Results

Terms	Documents
L67 and route\$	2

Database:

US Pre-Grant Publication Full-Text Database
 US Patents Full-Text Database
 US Patents OCR Backfile
 EPO Abstracts Database
 JPO Abstracts Database
 Derwent World Patents Index
 IBM Technical Disclosure Bulletin Database

Search Type: ☒ Prior Art ☐ Interference

Search:

L69

Search History

 DATE: Tuesday, February 01, 2011 [Purge Queries](#) [Printable Copy](#) [Create Case](#)

<u>Set</u> <u>Name</u>	<u>Query</u>	<u>Hit</u> <u>Count</u>	<u>Set</u> <u>Name</u> <u>Result</u> <u>Set</u>	<u>Set Name</u> <u>Grid</u>
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Prior Art Searches

DB=EPAB,JPAB,DWPI; THES=ASSIGNEE; PLUR=YES; OP=OR

<u>L69</u>	L67 and route\$	2	<u>L69</u>	<u>L69</u>
<u>L68</u>	L67 and gps\$	3	<u>L68</u>	<u>L68</u>
<u>L67</u>	(power\$ with consum\$) and (external\$ with (parameter\$ or information or data or environment\$)) and (vehicle\$ or car\$ or truck\$ or automobile\$)	102	<u>L67</u>	<u>L67</u>

DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; THES=ASSIGNEE; PLUR=YES; OP=OR

<u>L66</u>	L64 and ((power\$ or energ\$) with consum\$)	13	<u>L66</u>	<u>L66</u>
<u>L65</u>	L64 and 701/\$.ccls.	8	<u>L65</u>	<u>L65</u>
<u>L64</u>	l60 or l62 or l63	22	<u>L64</u>	<u>L64</u>

DB=PGPB,USPT; THES=ASSIGNEE; PLUR=YES; OP=OR

<u>L63</u>	(20020195288 20030015874 20030006914 6281660 5650931)! [PN]	5	<u>L63</u>	<u>L63</u>
<u>L62</u>	("20060005736" "20030015358" "20070112475" "6814170") [PN]	4	<u>L62</u>	<u>L62</u>

DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; THES=ASSIGNEE; PLUR=YES; OP=OR

<u>L61</u>	159	4	<u>L61</u>	<u>L61</u>
<i>DB=USPT; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L60</u>	("2006/0005736" "2003/0015358" "6814170" "20060005736" "20030015358") [URPN]	13	<u>L60</u>	<u>L60</u>
<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L59</u>	L52	4	<u>L59</u>	<u>L59</u>
<i>DB=PGPB; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L58</u>	11/283137 and gps\$ and map\$	1	<u>L58</u>	<u>L58</u>
<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L57</u>	L51 and ((divid\$ or segment\$ or disect\$) with (destinat\$ or route\$))	10	<u>L57</u>	<u>L57</u>
<i>DB=PGPB; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L56</u>	L51 and ((divid\$ or segment\$ or disect\$) with (destinat\$ or route\$))	5	<u>L56</u>	<u>L56</u>
<u>L55</u>	L54 and ((divid\$ or segment\$ or disect\$) with (destinat\$ or route\$))	1	<u>L55</u>	<u>L55</u>
<u>L54</u>	20030015358	1	<u>L54</u>	<u>L54</u>
<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L53</u>	L52 and destinat\$	3	<u>L53</u>	<u>L53</u>
<u>L52</u>	L51 and gps\$ and map\$	4	<u>L52</u>	<u>L52</u>
<u>L51</u>	L50 or L49	10	<u>L51</u>	<u>L51</u>
<u>L50</u>	L48 and @ad<=20051117	10	<u>L50</u>	<u>L50</u>
<u>L49</u>	L48 and @pd<=20051117	4	<u>L49</u>	<u>L49</u>
<u>L48</u>	L30 and ((divid\$ or segment\$ or disect\$) with route\$)	33	<u>L48</u>	<u>L48</u>
<u>L47</u>	L33 and ((divid\$ or segment\$ or disect\$) with route\$)	0	<u>L47</u>	<u>L47</u>
<i>DB=PGPB,USPT; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L46</u>	L43 and (notif\$ or acknowleg\$ or alarm\$ or alert\$ or display\$)	3	<u>L46</u>	<u>L46</u>
<i>DB=USPT; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L45</u>	L43 and (notif\$ or acknowleg\$ or alarm\$ or alert\$ or display\$)	1	<u>L45</u>	<u>L45</u>
<u>L44</u>	6895320.pn. and (notif\$ or acknowleg\$ or alarm\$ or alert\$ or display\$)	0	<u>L44</u>	<u>L44</u>
<i>DB=PGPB,USPT; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L43</u>	L42 and 701/\$.ccls.	5	<u>L43</u>	<u>L43</u>
<u>L42</u>	L30 and ((proper\$ or appropriat\$ or efficient\$ or reason\$) with speed\$ with (distance\$ or segment\$))	12	<u>L42</u>	<u>L42</u>
<u>L41</u>	L30 and (efficient\$ with speed\$ with segment\$)	1	<u>L41</u>	<u>L41</u>
<u>L40</u>	L32 and (efficient\$ with speed\$ with segment\$)	0	<u>L40</u>	<u>L40</u>
<u>L39</u>	L4 and ((efficient\$ with speed\$) same distance\$)	0	<u>L39</u>	<u>L39</u>
<u>L38</u>	L4 and ((efficient\$ with speed\$) same travel\$ same distance\$)	0	<u>L38</u>	<u>L38</u>
<u>L37</u>	L4 and ((efficient\$ with speed\$) same segment\$)	1	<u>L37</u>	<u>L37</u>
<u>L36</u>	L4 and (efficient\$ with speed\$ with segment\$)	1	<u>L36</u>	<u>L36</u>
<u>L35</u>	L34 and (power\$ with consum\$ with manag\$)	1	<u>L35</u>	<u>L35</u>
<u>L34</u>	L33 and environment\$	29	<u>L34</u>	<u>L34</u>
<u>L33</u>	L32 and ((calculat\$ or comput\$ or determin\$ or decid\$) with power\$)	68	<u>L33</u>	<u>L33</u>
<u>L32</u>	L31 and @pd<=20051117	81	<u>L32</u>	<u>L32</u>

<u>L31</u>	L30 and 701/\$.ccls.	222	<u>L31</u>	<u>L31</u>
<u>L30</u>	vehicle\$ and sens\$ and (power\$ with consum\$).clm. and process\$ and (external\$ or exterior\$ or environ\$)	1550	<u>L30</u>	<u>L30</u>
<u>L29</u>	L28 and 701/\$.ccls.	1	<u>L29</u>	<u>L29</u>
<u>L28</u>	L27 and sens\$ and (power\$ with consum\$).clm. and process\$ and (external\$ or exterior\$ or environ\$)	21	<u>L28</u>	<u>L28</u>
<u>L27</u>	L18 not L26	27	<u>L27</u>	<u>L27</u>
<u>L26</u>	L11 not L7	9	<u>L26</u>	<u>L26</u>
<i>DB=PGPB; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L25</u>	L24 and process\$ and (external\$ or exterior\$ or environ\$)	1	<u>L25</u>	<u>L25</u>
<u>L24</u>	20050233185	1	<u>L24</u>	<u>L24</u>
<i>DB=PGPB,USPT; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L23</u>	L21 and sens\$ and (power\$ with consum\$).clm.	5	<u>L23</u>	<u>L23</u>
<u>L22</u>	L21 and (gps\$ or navigation\$)	0	<u>L22</u>	<u>L22</u>
<u>L21</u>	L20 and environment\$	5	<u>L21</u>	<u>L21</u>
<u>L20</u>	L19 and (regulat\$ with power\$) and vehicle\$	5	<u>L20</u>	<u>L20</u>
<u>L19</u>	L18 and (power\$ with consum\$ with manag\$)	19	<u>L19</u>	<u>L19</u>
<u>L18</u>	L17 and ((calculat\$ or comput\$ or determin\$ or decid\$) with power\$)	27	<u>L18</u>	<u>L18</u>
<u>L17</u>	L4 not L10	28	<u>L17</u>	<u>L17</u>
<u>L16</u>	L15 not L14	7	<u>L16</u>	<u>L16</u>
<u>L15</u>	L10 and ((calculat\$ or comput\$ or determin\$ or decid\$) with power\$)	9	<u>L15</u>	<u>L15</u>
<u>L14</u>	L13 and ((calculat\$ or comput\$ or determin\$ or decid\$) with power\$)	2	<u>L14</u>	<u>L14</u>
<u>L13</u>	L12 and L5	9	<u>L13</u>	<u>L13</u>
<u>L12</u>	L10 not L11	9	<u>L12</u>	<u>L12</u>
<u>L11</u>	L10 and (regulat\$ with power\$)	10	<u>L11</u>	<u>L11</u>
<u>L10</u>	L9 and (power\$ with consum\$ with manag\$).clm.	19	<u>L10</u>	<u>L10</u>
<u>L9</u>	L5 not L8	23	<u>L9</u>	<u>L9</u>
<u>L8</u>	L7 not L6	3	<u>L8</u>	<u>L8</u>
<u>L7</u>	L4 and (speed\$ and route\$) and navigat\$	6	<u>L7</u>	<u>L7</u>
<u>L6</u>	L4 and (speed\$.clm. and route\$.clm.) and navigat\$	3	<u>L6</u>	<u>L6</u>
<u>L5</u>	L4 and (external\$ with (parameter\$ or information or data or environment\$)).clm.	26	<u>L5</u>	<u>L5</u>
<u>L4</u>	L2 or L3	47	<u>L4</u>	<u>L4</u>
<u>L3</u>	L1 and @pd<=20051117	30	<u>L3</u>	<u>L3</u>
<u>L2</u>	L1 and @ad<=20051117	47	<u>L2</u>	<u>L2</u>
<u>L1</u>	(power\$ with consum\$).clm. and (power\$ with manage\$).clm. and (external\$ with (parameter\$ or information or data or environment\$)) and (vehicle\$ or car\$ or truck\$ or automobile\$)	106	<u>L1</u>	<u>L1</u>

END OF SEARCH HISTORY



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BIB DATA SHEET

CONFIRMATION NO. 3291

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
11/283,137	11/17/2005	701	3661	MTS-101/US		
APPLICANTS Martin Koebler, Saal/Donau, GERMANY; Nicole G. Goldstein, Woodside, CA; Stephen J. Brown, Woodside, CA; Jason H. Harper, Pleasanton, CA;						
** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** ** SMALL ENTITY ** 12/21/2005						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and /CUONG H NGUYEN/ Acknowledged Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY GERMANY	SHEETS DRAWINGS 14	TOTAL CLAIMS ~~22~~ 4	INDEPENDENT CLAIMS ~~3~~ 1
ADDRESS LUMEN PATENT FIRM 350 Cambridge Avenue Suite 100 PALO ALTO, CA 94306 UNITED STATES						
TITLE Power management systems and devices						
FILING FEE RECEIVED 550	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

Modified Version of PTO/SB/08A (Substitute for Form 1449/PTO)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS				Application Number	11/283137
				Filing Date	11/17/2005
				First Named Inventor	Martin Koebler
				Art Unit	3661
				Examiner Name	Nguyen, Cuong H
Sheet	2	of	3	Attorney Docket Number	MTS-101/US

US Patent Documents						
Examiner Initials	Cite No.	Document Number Number/Kind Code	Publication Date mm-dd-yyyy	Name	Relevant Information	
/CHN/	A	US- 4347496	08/31/1982	Kubalak et al.		
/CHN/	B	US- 4459671	07/10/1984	Teass et al.		
/CHN/	C	US- 5315977	05/31/1994	Fossen		
/CHN/	D	US- 5929609	07/27/1999	Joy et al.		
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/CHN/	L	US- 6662642	12/16/2003	Breed et al		
/CHN/	M	US- 6701897	03/09/2004	Chatfield		
/CHN/	N	US- 6809429	10/26/2004	Frank		
/CHN/	O	US- 6838858	01/04/2005	Berneis et al		
Foreign Patent Documents						
Examiner Initials	Cite No.	Document Number Country/Number/Kind Code	Publication Date mm-dd-yyyy	Name	Relevant Information	T

Examiner	/Cuong Nguyen/ (02/03/2011)	Date Considered	
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* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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 USC 122 and 37 CFR 1.11 and 1.14.

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

11283137 - GAU: 3661

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS	Application Number	11/283137
	Filing Date	11/17/2005
	First Named Inventor	Martin Koebler
	Art Unit	3661
	Examiner Name	Nguyen, Cuong H
Sheet <u>3</u> of <u>4</u>	Attorney Docket Number	MTS-101/US

[illegible]

Examiner	/Cuong Nguyen/ (02/03/2011)	Date Considered	
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Modified Version of PTO/SB/08B (Substitute for Form 1449/PTO)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS		Application Number	11/283137
		Filing Date	11/17/2005
		First Named Inventor	Martin Koebler
		Art Unit	3661
		Examiner Name	Nguyen, Cuong H
Sheet	4	of	4
		Attorney Docket Number	MTS-101/US

Non Patent Literature Documents			
Examiner Initials	Cite No.	Name (IN CAPITALS), Title, Date, Pages, Volume-Issue, Publisher, City, Country	T
/CHN/	A	HIBBS, "GM Sunraycer Case History/M101 lecture 2-2", 12/01/1990, pages 1-37, Society for Automotive Engineers, Inc., Warrendale, USA	
/CHN/	B	CASSIDY et al, "GM Sunraycer Case History/M101 lecture 4-1", 12/01/1990, pages 1-61, Society for Automotive Engineers, Inc., Warrendale, USA	
/CHN/	C	LOVINS et al, "Winning the Oil Endgame", 03/01/2005, page 50, Rocky Mountain Institute, Snowmass, USA	
/CHN/	D	ROCHE et al, "The Speed of Light, The 1996 World Solar Challenge", 1997, pages 43-46 & 189-194, UNSW	
	E	~~"Answers.com", pages 1-7, Answers.com, http://www.answers.com/topic/drag-coefficient-1~~	
	F	~~"Cell Specification Data", pages 1-2, Kokom Co., Ltd., http://www.kokom.com/product/product_pdf/high_power/PL-301_SLPB60460330H_70Ah_Grade.pdf~~	
	G		

Examiner	/Cuong Nguyen/ (02/03/2011)	Date Considered	
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/283,137	11/17/2005	Martin Koebler	MTS-101/US	3291
30869	7590	08/12/2010		
LUMEN PATENT FIRM 350 Cambridge Avenue Suite 100 PALO ALTO, CA 94306			EXAMINER NGUYEN, CUONG H	
			ART UNIT 3661	PAPER NUMBER
			NOTIFICATION DATE 08/12/2010	DELIVERY MODE 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):

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Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
11283137	11/17/05	KOEBLER ET AL.	MTS-101/US

LUMEN PATENT FIRM
350 Cambridge Avenue
Suite 100
PALO ALTO, CA 94306

EXAMINER

CUONG H.. NGUYEN

ART UNIT	PAPER
3661	20100729

DATE MAILED:

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

Commissioner for Patents

The Reply filed in July 19, 2010 is considered timely for an Office Action mailed on 1/15/2010. Therefore, an abandonment mailed on 7/27/2010 is vacated.

/CUONG H. NGUYEN/
Primary Examiner, Art Unit 3661



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.
11/283,137	11/17/2005	Martin Koebler	MTS-101/US	3291
30869	7590	07/27/2010	EXAMINER	
LUMEN PATENT FIRM 350 Cambridge Avenue Suite 100 PALO ALTO, CA 94306			NGUYEN, CUONG H	
			ART UNIT	PAPER NUMBER
			3661	
			NOTIFICATION DATE	DELIVERY MODE
			07/27/2010	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):

ptomail@lumen.com

Notice of Abandonment	Application No.	Applicant(s)	
	11/283,137	KOEBLER ET AL.	
	Examiner	Art Unit	
	CUONG H. NGUYEN	3661	

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

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 15 January 2010.
 - (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.
 - (b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection.
(A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
 - (c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
 - (d) ☒ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
 - (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
 - (b) ☐ The submitted fee of \$_____ is insufficient. A balance of \$_____ is due.
The issue fee required by 37 CFR 1.18 is \$_____. The publication fee, if required by 37 CFR 1.18(d), is \$_____.
 - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
 - (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
 - (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☐ The reason(s) below:

/CUONG H. NGUYEN/
Primary Examiner, Art Unit 3661

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 11/283137
Conf. No.: 3291
5 First named inventor: Koebler, Martin
Filing date: 11/17/2005
Title: Power Management Systems and Designs
TC/A.U.: 3661
Examiner: Nguyen, Cuong H
10 Docket No.: MTS-101/US
Customer No.: 30869

Reply

15 Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

20 In response to the Office action of 01/15/2010, please reconsider the above-identified application in view of the following amendments and/or remarks.

07/19/2010 EAREGAY1 00000020 11283137
01 FC:2253 555.00 DP

Amendments to the Claims

Replace all prior versions and listings of claims in the application with the following list of claims.

5 1-16. (Cancelled)

17. (Currently Amended) A method of managing the power consumption of a vehicle, comprising:

- (a) ~~receiving and processing data by one or more processors, the data comprising:~~
10 ~~(i) information about the external environment of a vehicle, (ii) information about the operational status of the vehicle, (iii) one or more command inputs, and (iv) one or more operational parameters of the vehicle; and~~
- (b) ~~calculating by the one or more processors an applied power for the vehicle engine based on the received and processed data, wherein the applied power is~~
15 ~~used to manage the power consumption of the vehicle to travel a route or a segment of a route.~~
- (a) a computer device receiving a route;
(b) said computer device segmenting said route into segment destinations; and
(c) said computer device for each of said segment destinations:
20 (i) calculating an optimized speed by minimizing power consumption over said segment destination, wherein information is (j) information about the external environment of a vehicle, (jj) information about the operational status of the vehicle, (jjj) one or more user command inputs, or (jv) one or more operational parameters of the vehicle are

received as input to said calculating and analyzed by one or more processors;

(ii) calculating a probable speed;

(iii) determining an efficient speed based on said optimized speed and said probable speed; and

(iv) applying the calculated power corresponding to said determined efficient speed to the vehicle engine to travel said segment destination.

10 18-19. **(Cancelled)**

20. **(Currently Amended)** The method of claim ~~[[19]]~~17, further comprising continuously calculating said efficient speed ~~the applied power~~ until a final destination is reached.

15

21. **(Currently Amended)** The method of claim ~~[[19]]~~17, wherein the step of determining ~~a target~~ said efficient speed for the vehicle further comprises determining a historical speed for a similar destination.

20 22. **(Original)** The method of claim 17, further comprising notifying the operator of the vehicle of the calculated applied power.

REMARKS/ARGUMENTS

Remarks concerning rejections under 35 USC 112

5 In response to the rejection of claim 4, the Applicant would like to point out that this rejection is moot since claim 4 is cancelled.

Remarks concerning rejections under 35 USC 103

10 In response to the 103 rejections of the claims, the Applicant would like to point out that the rejection is moot with respect to claims 1-16, and 18-19 since there were cancelled. Independent claim 17 has been amended and the Applicant argues that this claim is non-obvious over Matsubara or over of Matsubara in view of Bauer. Support for the amendment can be found on e.g. pages 17-29 of the specification and the associated figures. No new matter was introduced.

15 The cited prior art of record does not teach or suggest the combination of elements currently defined in independent claim 17. Accordingly, allowance of the claims now in the application is kindly requested.

20 Respectfully submitted,

/ Ron Jacobs /

25 Ron Jacobs, Reg. No 50,142

30 LUMEN PATENT FIRM
350 Cambridge Ave., Suite 100
Palo Alto, CA 94306
(650) 424-0100

IFU

 TRANSMITTAL FORM	Application Number	11/283137
	Filing Date	11/17/2005
	First Named Inventor	Martin Koebler
	Art Unit	3661
	Examiner Name	Nguyen, Cuong H
	LUMEN Docket Number	MTS-101/US

ENCLOSURES (Check all that apply)		
☒ Small Entity Claimed ☒ Fee Attached ☒ Reply / Amendment No. of Pages <u> 4 </u> ☐ After Final ☐ Affidavit(s)/Declaration(s) ☐ Information Disclosure Statement ☐ Copies of Cited References ☐ Drawings No. of Sheets <u> </u>	☐ Reply to Missing Parts/ Incomplete Application ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53 ☐ Declaration No. of Pages <u> </u> ☐ Recordation Cover Sheet & Assignment No. of Pages <u> </u> ☐ Power of Attorney, Revocation Change of Corresp. Address ☐ Statement(s) under 3.73(b) ☐ Copy of Assignment(s) ☐ Power(s) of Attorney	☐ Certified Copy of Priority Doc(s) ☐ Terminal Disclaimer ☐ Request for Refund ☐ After Allowance Comm. to TC ☐ Appeal Comm. to TC (Appeal Notice, Brief, Reply Brief) ☐ Appeal Comm. to Board of Appeals and Interferences ☐ Petition to Revive ☐ Certificate of Correction
☐ Other:		
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT		
FIRM NAME	LUMEN PATENT FIRM	
SIGNATURE	/ Ron Jacobs / Reg.No. 50,142	
PRINTED NAME	Ron Jacobs	
DATE	7/13/10	REGISTRATION NUMBER 50,142

CERTIFICATE OF TRANSMISSION/MAILING	
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below:	
SIGNATURE	/ Patricia Shepherd /
PRINTED NAME	Patricia Shepherd
DATE	7/14/10



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/283,137	11/17/2005	Martin Koebler	MTS-101/US	3291
30869	7590	01/15/2010		
LUMEN PATENT FIRM 350 Cambridge Avenue Suite 100 PALO ALTO, CA 94306			EXAMINER NGUYEN, CUONG H	
			ART UNIT	PAPER NUMBER
			3661	
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Please find below and/or attached an Office communication concerning this application or proceeding.

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

ptomail@lumen.com

Office Action Summary	Application No. 11/283,137	Applicant(s) KOEBLER ET AL.	
	Examiner CUONG H. NGUYEN	Art Unit 3661	

-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 7/27/09 (an amendment).

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ 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

4) ☒ Claim(s) 1,4-8,10,11,13-17 and 19-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1,4-8,10,11,13-17 and 19-22 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ 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).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a) ☐ All b) ☐ Some * c) ☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ 5) ☐ Notice of Informal Patent Application 6) ☐ Other: _____
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DETAILED ACTION

1. This Office Action is the answer to an "Amendments to the Claims" received on 7/27/2009.
2. Claims 1, 4-8, 10-11, 13-17, and 19-22 are pending in this application.

Response

3. 35 USC 101 rejections mailed on 6/19/2009 are withdrawn. The examiner submits that independent claims 1, 11, and 17 are very BROAD based on same concepts of cited prior art: the pending claimed concept is not original ideas of applicants since this concept/solution of saving a vehicle power consumption has long been taught (e.g., claim 17: This claim 17 is mainly directed to a method comprising steps of managing a vehicle power consumption:

- receiving, and processing input data; then
- calculating a power consumption based on applied/required powers.

New grounds of rejections on pending claims are found, and are presented below.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regards as the invention

- This claim comprises a motor control "mechanism" controlling an application of power to a vehicle engine. It is unclear that claimed "control mechanism" is software

instructions, or hardware, or combination of software and hardware; further, what is that claimed “control mechanism”?

Claim Rejections - 35 USC § 103

The following is a quotation of 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 negated by the manner in which the invention was made.

5. Claims 1, 11, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara et al. (US Pat. 6,843,337).

Matsubara et al., and Bauer et al., already considered what applicants claim as their own intellectual property.

A. These claims are directed to a vehicle’s device/method to calculate that vehicle’s power consumption with multiple processors with inputting data for that task; it is obvious to one of ordinary skill in the art that “data comprise related information”.

Matsubara et al., suggest a structure, and a method to efficiently use power consumption in a vehicle taking into account internal (engine water temperature), external environment (i.e., air temperature), engine parameters (e.g., vehicle speed, vehicle’s load), user control inputs (e.g., using air-conditioning or heaters), (i.e., inputting all control parameters), calculations to obtain that result.

Applicants claim 2 limitations in this “physical” device:

- a processor for receiving and analyzing data (see Matsubara et al., col.4 lines 1-5);
- and

- a processor for calculating required power (see Matsubara et al., Fig. 3, “CALCULATION OF TARGET AMOUNT OF IGNITION TIMING RETARDATION”).
- a controller to regulate/manage/distribute power from requested inputs (see Matsubara et al., Fig. 7, selecting a step from S54, S55, or S56 depending on calculated vehicle’s conditions).

It would have been obvious with one of ordinary skill in the art at the time this invention was made to implement Matsubara et al.’s invention for disclosing about above processor(s), and a controller for an advantage of flexibility functions of using different processing units.

B. As per claims 5-6, 8, 13-14: The rationales and reference for rejections of claim 1 are incorporated.

Theses claims merely explain further about what kind of input information. The examiner submits that these specific information are not limitations of a claimed system/device. A structural component of claimed physical device is inputting ports that receiving information. It is obvious that any inputting information would be received by Matsubara et al.’s processor – not necessary a “specific” input required in claim 5, or vehicle operational information in claim 6/8/14 (e.g., a tire pressure/a weight of vehicle), or in claim 13.

C. As per claims 7, and 15: The rationales and reference for rejections of claim 1 are incorporated.

It has been obvious that command inputting to a vehicle’s processor is selected from:

- an acceleration applied by a driver, ~~or~~ a braking action applied by a driver, ~~or~~ a vehicle's final destination, or a vehicle's speed (taught by Bauer et al.), or maximum and minimum range over which speed should adjust (e.g., select highway's speed), or navigation route (e.g., taught by Bauer et al., inputting info. For a fastest time or a shortest distance).

These above input information have been used by a vehicle's driver (at least, above underlined example) to control a fuel consumption of a vehicle.

D. As per claim 10: The rationales and reference for rejections of claim 1 are incorporated.

Matsubara et al.'s vehicle engine is for a hybrid vehicle (see Matsubara et al., the abstract); or Bauer et al. teach that a vehicle engine is a gasoline combustion vehicle.

E. As per claim 16: The rationales and reference for rejections of claim 11 are incorporated.

It has been obvious that Matsubara et al. clearly use a storage device/a memory to store a disclosed process in Fig. 2; (this claimed feature was also taught by Bauer et al. Fig. 1 ref. 18).

F. As per claim 20: The rationales and reference for rejections of claim 11 are incorporated.

A characteristic of Matsubara et al.'s processor is continuously calculations until turning off a power supply to it (e.g., until turning off an ignition key).

G. As per claim 21: The rationales and reference for rejections of claim 11 are incorporated.

A step of determining a vehicle speed based on input parameters was taught by Matsubara et al., and Bauer et al.'s Fig. 1.

H. As per claim 22: The rationales and reference for rejections of claim 11 are incorporated.

It would have been obvious with one of ordinary skill in the art at the time this invention was made to implement Matsubara et al.'s invention for notifying a vehicle's driver

about calculated applied power from a display screen since that obtained information is ready to acknowledge a driver of his vehicle's current status (i.e., merely displaying available information).

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara et al. (US Pat. 6,843,337), in view of Bauer et al., (US Pat. 6,895,320).

The rationales and reference for rejections of claim 17 are incorporated.

- Matsubara et al., do not explicitly teach about calculating an energy efficient speed for the vehicle to travel to the segment destination; then determining a target speed for the vehicle to travel to that segment destination; or calculating the applied power from the target speed.

However, Bauer et al., suggest claimed step of calculating an applied/requested power 11 inputting to CPU 4, further comprises:

- Determining/selecting a route (see Bauer et al., col. 1 lines 53-59, and Fig. 1, internal/external inputs to CPU 4).
- segmenting the route into one segment destination (e.g., this step can be skipped because a travel route may be only on a segment of said route);
- calculating an energy efficient speed for the vehicle to travel to the segment destination;
determining/calculating a target speed for the vehicle to travel to the segment destination (see Bauer et al., commanding a gearbox 3 in Fig.1); or calculating the applied power from the target speed (see Bauer et al., col. 8, lines 39-45, and claim 14).

- It would have been obvious with one of ordinary skill in the art at the time this invention was made to implement Matsubara et al.'s invention with Bauer et al., for calculating a proper speed according to requested power during travel on a distance for an advantage of using minimum energy consumption while traveling.

Conclusion

6. Pending claims are rejected.
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CUONG H. NGUYEN whose telephone number is 571-272-6759. The examiner can normally be reached on 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, THOMAS G. BLACK can be reached on 571-272-6956. The Rightfax number for the organization where this application is assigned is 571-273-6759.

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).

Please provide support, with page and line numbers, for any amended or new claim in an effort to help advance prosecution; otherwise any new claim language that is introduced in an amended or new claim may be considered as new matter, especially if the Application is a Jumbo Application.

Application/Control Number: 11/283,137
Art Unit: 3661

Page 8

/CUONG H. NGUYEN/
Primary Examiner
Art Unit 3661

Notice of References Cited	Application/Control No. 11/283,137		Applicant(s)/Patent Under Reexamination KOEBLER ET AL.	
	Examiner CUONG H. NGUYEN		Art Unit 3661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,393,573	05-2002	Gillespie et al.	713/324
*	B	US-6,838,858	01-2005	Berneis et al.	320/135
*	C	US-6,794,848	09-2004	Shinada et al.	320/104
*	D	US-6,163,690	12-2000	Lilja, Patrik	455/574
*	E	US-7,283,838	10-2007	Lu, Wei	455/550.1
*	F	US-6,470,240	10-2002	Haynes et al.	701/1
*	G	US-2003/0033069	02-2003	Bauer et al.	701/65
*	H	US-6,895,320	05-2005	Bauer et al.	701/54
*	I	US-6,843,337	01-2005	Matsubara et al.	180/65.26
*	J	US-7,099,770	08-2006	Naden et al.	701/117
	K	US-			
	L	US-			
	M	US-			

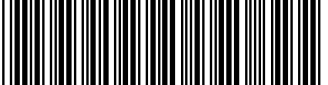
FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
*	U	Jin-Sung Kim et al., An adaptive address power saving method based on the prediction of power consumption in and AC PDP., Industrial Electronics, IEEE Transaction on, vol. 56, issue 12, Dec. 2009 pp. 4949-4948; Digital Object Identifier 10.1109/TIE.2009.2026373.
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes 	Application/Control No.	Applicant(s)/Patent under Reexamination	
	11/283,137	KOEHLER ET AL.	
	Examiner	Art Unit	
	CUONG H. NGUYEN	3661	

SEARCHED			
Class	Subclass	Date	Examiner
701	35-36	12/20/2009	CHN
320	135,104	12/20/2009	CHN
713	324,300	12/20/2009	CHN
713	320	12/20/2009	CHN
108	54.1	12/20/2009	CHN
323	282	12/20/2009	CHN

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
WEST/DERWENT	12/20/2009	CHN
IEEE Xplore	12/20/2009	CHN

Index of Claims 	Application/Control No.		Applicant(s)/Patent under Reexamination	
	11/283,137		KOEBLER ET AL.	
	Examiner		Art Unit	
	CUONG H. NGUYEN		3661	

✓	Rejected	—	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claim		Date									
Final	Original	12/20/09									
	1	✓									
	2										
	3										
	4	✓									
	5	✓									
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Refine Search

Search Results

Terms	Documents
L43 and (notif\$ or acknowleg\$ or alarm\$ or alert\$ or display\$)	2

Database:

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L46

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Search History

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Set Name	Query	Hit Count	Set Name Result Set	Set Name Grid
<i>Prior Art Searches</i>				
<i>DB=PGPB,USPT; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
L46	143 and (notif\$ or acknowleg\$ or alarm\$ or alert\$ or display\$)	2	L46	L46
<i>DB=USPT; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
L45	143 and (notif\$ or acknowleg\$ or alarm\$ or alert\$ or display\$)	0	L45	L45
L44	6895320.pn. and (notif\$ or acknowleg\$ or alarm\$ or alert\$ or display\$)	0	L44	L44
<i>DB=PGPB,USPT; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
L43	L42 and 701/\$.ccls.	4	L43	L43
L42	L30 and ((proper\$ or appropriat\$ or efficient\$ or reason\$) with speed\$ with (distance\$ or segment\$))	11	L42	L42
L41	L30 and (efficient\$ with speed\$ with segment\$)	1	L41	L41
L40	L32 and (efficient\$ with speed\$ with segment\$)	0	L40	L40
L39	L4 and ((efficient\$ with speed\$) same distance\$)	0	L39	L39
L38	L4 and ((efficient\$ with speed\$) same travel\$ same distance\$)	0	L38	L38

<u>L37</u>	L4 and ((efficient\$ with speed\$) same segment\$)	1	<u>L37</u>	<u>L37</u>
<u>L36</u>	L4 and (efficient\$ with speed\$ with segment\$)	1	<u>L36</u>	<u>L36</u>
<u>L35</u>	L34 and (power\$ with consum\$ with manag\$)	1	<u>L35</u>	<u>L35</u>
<u>L34</u>	L33 and environment\$	29	<u>L34</u>	<u>L34</u>
<u>L33</u>	L32 and ((calculat\$ or comput\$ or determin\$ or decid\$) with power\$)	68	<u>L33</u>	<u>L33</u>
<u>L32</u>	L31 and @pd<=20051117	81	<u>L32</u>	<u>L32</u>
<u>L31</u>	L30 and 701/\$.ccls.	180	<u>L31</u>	<u>L31</u>
<u>L30</u>	vehicle\$ and sens\$ and (power\$ with consum\$).clm. and process\$ and (external\$ or exterior\$ or environ\$)	1275	<u>L30</u>	<u>L30</u>
<u>L29</u>	L28 and 701/\$.ccls.	1	<u>L29</u>	<u>L29</u>
<u>L28</u>	L27 and sens\$ and (power\$ with consum\$).clm. and process\$ and (external\$ or exterior\$ or environ\$)	21	<u>L28</u>	<u>L28</u>
<u>L27</u>	L18 not L26	27	<u>L27</u>	<u>L27</u>
<u>L26</u>	L11 not L7	9	<u>L26</u>	<u>L26</u>
<i>DB=PGPB; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L25</u>	L24 and process\$ and (external\$ or exterior\$ or environ\$)	1	<u>L25</u>	<u>L25</u>
<u>L24</u>	20050233185	1	<u>L24</u>	<u>L24</u>
<i>DB=PGPB,USPT; THES=ASSIGNEE; PLUR=YES; OP=OR</i>				
<u>L23</u>	L21 and sens\$ and (power\$ with consum\$).clm.	5	<u>L23</u>	<u>L23</u>
<u>L22</u>	L21 and (gps\$ or navigation\$)	0	<u>L22</u>	<u>L22</u>
<u>L21</u>	L20 and environment\$	5	<u>L21</u>	<u>L21</u>
<u>L20</u>	L19 and (regulat\$ with power\$) and vehicle\$	5	<u>L20</u>	<u>L20</u>
<u>L19</u>	L18 and (power\$ with consum\$ with manag\$)	19	<u>L19</u>	<u>L19</u>
<u>L18</u>	L17 and ((calculat\$ or comput\$ or determin\$ or decid\$) with power\$)	27	<u>L18</u>	<u>L18</u>
<u>L17</u>	L4 not L10	28	<u>L17</u>	<u>L17</u>
<u>L16</u>	L15 not L14	7	<u>L16</u>	<u>L16</u>
<u>L15</u>	L10 and ((calculat\$ or comput\$ or determin\$ or decid\$) with power\$)	9	<u>L15</u>	<u>L15</u>
<u>L14</u>	L13 and ((calculat\$ or comput\$ or determin\$ or decid\$) with power\$)	2	<u>L14</u>	<u>L14</u>
<u>L13</u>	L12 and L5	9	<u>L13</u>	<u>L13</u>
<u>L12</u>	L10 not L11	9	<u>L12</u>	<u>L12</u>
<u>L11</u>	L10 and (regulat\$ with power\$)	10	<u>L11</u>	<u>L11</u>
<u>L10</u>	L9 and (power\$ with consum\$ with manag\$).clm.	19	<u>L10</u>	<u>L10</u>
<u>L9</u>	L5 not L8	23	<u>L9</u>	<u>L9</u>
<u>L8</u>	L7 not L6	3	<u>L8</u>	<u>L8</u>
<u>L7</u>	L4 and (speed\$ and route\$) and navigat\$	6	<u>L7</u>	<u>L7</u>
<u>L6</u>	L4 and (speed\$.clm. and route\$.clm.) and navigat\$	3	<u>L6</u>	<u>L6</u>
<u>L5</u>	L4 and (external\$ with (parameter\$ or information or data or environment\$)).clm.	26	<u>L5</u>	<u>L5</u>
<u>L4</u>	L2 or L3	47	<u>L4</u>	<u>L4</u>
<u>L3</u>	L1 and @pd<=20051117	30	<u>L3</u>	<u>L3</u>
<u>L2</u>	L1 and @ad<=20051117	47	<u>L2</u>	<u>L2</u>

<u>L1</u>	(power\$ with consum\$).clm. and (power\$ with manage\$).clm. and (external\$ with (parameter\$ or information or data or environment\$)) and (vehicle\$ or car\$ or truck\$ or automobile\$)	75	<u>L1</u>	<u>L1</u>
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END OF SEARCH HISTORY



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 11/283137

Conf. No.: 3291

5 First named inventor: Koebler, Martin

Filing date: 11/17/2005

Title: Power Management Systems and Designs

TC/A.U.: 3661

Examiner: Nguyen, Cuong H

10 Docket No.: MTS-101/US

Customer No.: 30869

Response to Office Action

15 Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

20 In response to the Office action of 06/19/2009, please reconsider the above-identified application in view of the following amendments and/or remarks.

Amendments to the Claims

Replace all prior versions and listings of claims in the application with the following list of claims.

5

1. **(Currently Amended)** A device for managing the power consumption of a[[n]]
automotive vehicle comprising: ~~power management logic operable to calculate an applied
power for the vehicle engine from: information about the external environment of the
vehicle; information about the operational status of the vehicle; one or more command~~
10 ~~inputs; and one or more operational parameters of the vehicle.~~

(a) one or more processors for receiving and analyzing data, the data comprising: (i)
information about the external environment of a vehicle, (ii) information about the
operational status of the vehicle, (iii) one or more user command inputs, and (iv)
one or more operational parameters of the vehicle; and

15 (b) said one or more processors calculating an applied power for the vehicle engine
based on the received and processed data, wherein the applied power is used to
manage the power consumption of the vehicle to travel a route or a segment of a
route.

20 2. **(Cancelled)**

3. **(Cancelled)**

4. **(Original)** The device of claim 1, further comprising a motor control
mechanism, wherein the motor control mechanism controls the application of

power to the vehicle engine.

5. **(Original)** The device of claim 1, wherein information about the external environment of the vehicle is selected from the group consisting of: the current location of the vehicle, the elevation of the vehicle, upcoming elevations of the vehicle, the current slope/grade of road, the predicted slope/grade of the next segments of road, traffic surrounding the vehicle, the location of stoplights, the timing of stoplights, a map of the roadway, the present angle of the sun, the predicted angle of the sun for upcoming route segments, the weather around the vehicle, present wind direction, the predicted wind direction for upcoming route segments, present wind velocity, the predicted wind velocity for upcoming route segments, current temperature, the predicted temperature for upcoming route segments, current air pressure, predicted air pressure for upcoming route segments, time of day, date, day of week, visibility, present road conditions, predicted road conditions for upcoming route segments, and the distance from other vehicles.
6. **(Original)** The device of claim 1, wherein information about the operational status of the vehicle is selected from the group consisting of: the vehicle's current speed, the motor speed, the vehicle's current orientation, the RPM of the vehicle's motor, wheel rotations per minute, the battery state, the voltage of the battery, the amp hours from the battery, the state of the battery, temperature of battery, the age of the battery, and the number of times the

battery has charged and discharged, the tire pressure, the drag force due to rolling resistance of the vehicle, the weight of vehicle, the amount of air going to the engine, the amount of gas going to engine, and the weight of driver.

- 5 7. **(Original)** The device of claim 1, wherein the command input is selected from the group consisting of: the acceleration applied by a driver, the braking applied by a driver, the vehicle's known or predicted final destination, the vehicle's known or predicted interim destination, preferred speed, maximum and minimum range over which speed should adjust, and preferred route.

10

8. **(Original)** The device of claim 1, wherein the operational parameter of the vehicle is selected from the group consisting of: aerodynamic parameters (CDA), rolling resistance parameters (Crr1 and Crr2), drive train efficiency parameters, motor efficiency parameters, and battery model parameters,
15 battery charge and discharge relationships, type of battery.

9. **(Cancelled)**

10. **(Original)** The device of claim 1, wherein the vehicle engine comprises an
20 engine selected from the group consisting of: an internal combustion engine (gasoline, diesel, ethanol and other derivatives), a hybrid internal combustion/electric engine, an electric engine powered by the electric grid (plug-in), an electric engine powered by the sun (solar), an electric engine

powered by hydrogen fuel cell.

11. **(Currently Amended)** A system for managing the power consumption of a[[n]]
automotive vehicle, comprising: ~~a first input, operable to receive information about~~
5 ~~the external environment of the vehicle; a second input, operable to receive~~
~~information about the operational status of the vehicle; a third input, operable to~~
~~receive one or more command inputs from a driver of the vehicle; a memory~~
~~containing vehicle information about one or more operational parameters of the~~
~~vehicle; power management logic operable to calculate an applied power for the~~
10 ~~vehicle engine from the first input, the second input, the third input, and the~~
~~memory; and a processor responsive to the power management logic.~~
- (a) a power management system comprising one or more processors to (j) process
data, wherein the data comprises (i) information about the external
environment of a vehicle, (ii) information about the operational status of the
15 vehicle, (iii) one or more command inputs, and (iv) one or more operational
parameters of the vehicle, and (jj) determine an applied power for the vehicle
engine based on the processed data, wherein the applied power is used to
manage the power consumption of the vehicle to travel a route or a segment of
a route; and
- 20 (b) a motor controller to regulate the application of power the vehicle engine
using the determined applied power.

12. **(Cancelled)**

13. **(Currently Amended)** The system of claim 11, wherein the ~~first input~~
information about the external environment of a vehicle is selected from the
group consisting of: the current location of the vehicle, the elevation of the
vehicle, upcoming elevations of the vehicle, the current slope/grade of road,
the predicted slope/grade of the next segments of road, the vehicle's known or
predicted final destination, the vehicle's known or predicted interim
destination, traffic surrounding the vehicle, the location of stoplights, the
timing of stoplights, a map of the roadway, the present angle of the sun, the
predicted angle of the sun for upcoming route segments, the weather around
the vehicle, present wind direction, the predicted wind direction for upcoming
route segments, present wind velocity, the predicted wind velocity for
upcoming route segments, current temperature, the predicted temperature for
upcoming route segments, current air pressure, predicted air pressure for
upcoming route segments, time of day, date, day of week, visibility, present
road conditions, predicted road conditions for upcoming route segments, and
the distance from other vehicles.

14. **(Currently Amended)** The system of claim 11, wherein the ~~second input~~
information about the operational status of the vehicle is selected from the
group consisting of: the vehicle's current speed, the motor speed, the vehicle's
current orientation, the RPM of the vehicle's motor, wheel rotations per
minute, the battery state, the voltage of the battery, the amp hours from the

battery, the state of the battery, temperature of battery, the age of the battery, and the number of times the battery has charged and discharged, the tire pressure, the drag force due to rolling resistance of the vehicle, the weight of vehicle, the amount of air going to the engine, the amount of gas going to engine, and the weight of driver.

5

15. **(Currently Amended)** The system of claim 11, wherein the ~~third input~~ is one or more command inputs selected from the group consisting of: the acceleration applied by a driver, the braking applied by a driver, the intended destination, preferred speed, maximum and minimum range over which speed should adjust, and preferred route.

10

16. **(Currently Amended)** The system of claim 11, ~~wherein the further comprising a memory module, wherein the memory module~~ includes at least one operational parameter of the vehicle selected from the group consisting of: aerodynamic parameters (CDA), rolling resistance parameters (Crr1 and Crr2), drive train efficiency parameters, motor efficiency parameters, and battery model parameters, battery charge and discharge relationships, type of battery.

15

20

17. **(Currently Amended)** A method of managing the power consumption of a vehicle, comprising:
~~calculating an applied power for the vehicle using a processor, the processor~~

~~receiving: a first input comprising information about the environment of the vehicle; a second input comprising information about the operational status of the vehicle; a third input comprising a command input from the driver of the vehicle; a fourth input comprising vehicle information about the operational parameters of the vehicle.~~

5

(a) receiving and processing data by one or more processors, the data comprising:
(i) information about the external environment of a vehicle, (ii) information
about the operational status of the vehicle, (iii) one or more command inputs,
and (iv) one or more operational parameters of the vehicle; and

10

(b) calculating by the one or more processors an applied power for the vehicle
engine based on the received and processed data, wherein the applied power is
used to manage the power consumption of the vehicle to travel a route or a
segment of a route.

15

18. (Cancelled)

20

19. (Currently Amended) The method of claim 17, wherein the step of calculating an applied power further comprises: determining a route; segmenting the route into one or more segment destinations; calculating an energy efficient speed for the vehicle to travel to the segment destination; determining a target speed for the vehicle to travel to the segment destination; ~~and~~ or calculating the applied power from the target speed.

20. **(Original)** The method of claim 19, further comprising continuously
calculating the applied power until a final destination is reached.

21. **(Original)** The method of claim 19, wherein the step of determining
a target speed for the vehicle further comprises determining a
historical speed for a similar destination.

22. **(Original)** The method of claim 17, further comprising notifying the
operator of the vehicle of the calculated applied power.

REMARKS/ARGUMENTS

Remarks concerning amendments to claims

Claims 1, 11, 13-15, 16-17 are amended.

5 Claims 2-3, 9, 12 and 18 are cancelled.

Claims 1, 4-8, 11-17, 19-22 remain.

Remarks concerning rejections under 35 USC 101

10 In response to the rejection of Claims 1, 11 and 17 under 35 USC 101, the Applicant has amended claims 1, 11 and 17 so that the steps of the claims are explicitly tied to a particular physical apparatus. In addition, that Applicant notes that the process as claimed is limited to a specific practical application. Accordingly, the claims as amended are directed toward statutory subject matter.

15

Respectfully submitted,

20

/ Ron Jacobs /

Ron Jacobs, Reg. No 50,142

25

LUMEN PATENT FIRM
350 Cambridge Ave., Suite 100
Palo Alto, CA 94306
(650) 424-0100



IFW

TRANSMITTAL FORM	Application Number	11/283137
	Filing Date	11/17/2005
	First Named Inventor	Martin Koebler
	Art Unit	3661
	Examiner Name	Nguyen, Cuong H
	LUMEN Docket Number	MTS-101/US

ENCLOSURES (Check all that apply)			
☒ Small Entity Claimed	☐ Reply to Missing Parts/ Incomplete Application	☐ Certified Copy of Priority Doc(s)	
☐ Fee Attached	☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53	☐ Terminal Disclaimer	
☒ Reply / Amendment No. of Pages <u>10</u>	☐ Declaration No. of Pages _____	☐ Request for Refund	
☐ After Final	☐ Recordation Cover Sheet & Assignment No. of Pages _____	☐ After Allowance Comm. to TC	
☐ Affidavit(s)/Declaration(s)	☐ Power of Attorney, Revocation Change of Corresp. Address	☐ Appeal Comm. to TC (Appeal Notice, Brief, Reply Brief)	
☐ Information Disclosure Statement	☐ Statement(s) under 3.73(b)	☐ Appeal Comm. to Board of Appeals and Interferences	
☐ Copies of Cited References	☐ Copy of Assignment(s)	☐ Petition to Revive	
☐ Drawings No. of Sheets _____	☐ Power(s) of Attorney	☐ Certificate of Correction	
☐ Other:			
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
FIRM NAME	LUMEN PATENT FIRM		
SIGNATURE	/ Ron Jacobs / Reg.No. 50,142		
PRINTED NAME	Ron Jacobs		
DATE	7/23/09	REGISTRATION NUMBER	50,142

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PRINTED NAME	Patricia Shepherd
DATE	7/23/09

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 11/283,137		Filing Date 11/17/2005		☐ To be Mailed				
APPLICATION AS FILED – PART I													
(Column 1)			(Column 2)			SMALL ENTITY ☒ OR		OTHER THAN SMALL ENTITY					
FOR		NUMBER FILED	NUMBER EXTRA		RATE (\$)	FEE (\$)	OR		RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A		N/A		OR		N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))		N/A	N/A		N/A		OR		N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A		N/A		OR		N/A				
TOTAL CLAIMS (37 CFR 1.16(j))		minus 20 =	*		X \$ =		OR		X \$ =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =	*		X \$ =		OR		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 \$250 (\$125 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))													
					TOTAL		OR		TOTAL				
* If the difference in column 1 is less than zero, enter "0" in column 2.													
APPLICATION AS AMENDED – PART II													
(Column 1)			(Column 2)			(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY			
AMENDMENT	07/27/2009		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))		* 17	Minus	** 22	= 0		X \$26 =	0	OR		X \$ =	
	Independent (37 CFR 1.16(h))		* 3	Minus	*** 3	= 0		X \$110 =	0	OR		X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))												
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
						TOTAL ADD'L FEE	0	OR		TOTAL ADD'L FEE			
AMENDMENT	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))												
						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 number found in the appropriate box in column 1.													

Legal Instrument Examiner:
/DONNA D. SMALLS LOGAN/

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/283,137	11/17/2005	Martin Koebler	MTS-101/US	3291
30869	7590	06/19/2009		
LUMEN PATENT FIRM 2345 YALE STREET SECOND FLOOR PALO ALTO, CA 94306			EXAMINER NGUYEN, CUONG H	
			ART UNIT 3661	PAPER NUMBER
			MAIL DATE 06/19/2009	DELIVERY MODE PAPER

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.

Office Action Summary	Application No.	Applicant(s)	
	11/283,137	KOEBLER ET AL.	
	Examiner	Art Unit	
	CUONG H. NGUYEN	3661	

-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 an IDS filed on 12/10/07.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ 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

4) ☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-22 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ 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).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a) ☐ All b) ☐ Some * c) ☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5) ☐ Notice of Informal Patent Application 6) ☐ Other: _____.
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DETAILED ACTION

1. This Office Action is the answer to original claims received on 11/17/2005.
2. Claims 1-22 are pending in this application.

Information Disclosure Statement

3. An IDS was filed on 12/10/2007 – it was considered.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1, 11 and 17 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

A. With respect to Claims 1, and 11, the claims lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 U.S.C. 101. They are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, they fail to fall within a statutory category. They are, at best, software/firmware logic(s) and input information (see claim 1 line 2: “power management logic” and see claim 11 line 7, therefore, this claim must require a storage medium to be executed by a microprocessor): these limitations are not “a device” claims.

With respect to “system” claim 11, it requires limitations are followed:

- a first input (operable to receive information about the external environment of the vehicle);
- a second input (operable to receive information about the operational status of the vehicle);
- a third input (operable to receive one or more command inputs from a driver of the vehicle);

- a memory (containing vehicle information about one or more operational parameters of the vehicle);
- power management logic operable to calculate an applied power for the vehicle engine from the first input, the second input, the third input, and the memory; and
- a processor responsive to the power management logic.

That "logic" is a functional descriptive material (e.g. merely data structures or software in "physical" senses), that is a claim to software, program, instructions, or an appropriate data structure not clearly on any medium to be executed by a microprocessor.

Claim 11 is a "system" defined merely by software or terms synonymous with software or files such as "logic", "interface", "GUI", etc., that comprises software, program, instructions, code or a "data structure" without any recitation of a *proper* computer readable medium.

B. As to independent claim 17: Its limitation is merely a step of calculating power consumption from inputs (see claim 17, line 2). This claim does not identify a particular machine/conversion to practice that claimed invention.

5. Dependent claims 2-10, 12-16, and 18-22 are also rejected because they inherit that same deficiency from their parent claims.

Conclusion

6. Claims 1-22 are not patentable.

7. Remark:

- Simple substitution of one known element for another to obtain predictable results will support a conclusion of obviousness. See MPEP 2143 (B)

- Drawings and pictures can anticipate claims if they clearly show the structure which is claimed. See MPEP 2125.
- According to MPEP § 2114 which states: A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim.
- As set forth in MPEP § 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

The prior art anticipate the structural limitations in the apparatus claims. Even if the prior art did not perform the method limitations recited in the apparatus claims, which the examiner is not conceding, it is believed that the structural arrangement in the prior art is capable of performing the method limitation recited in the apparatus claims.

Applicants are reminded that "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself." In re Thorpe, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted) - the preceding discussion on product-by-process principles applies to all examined claims currently pending.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CUONG H. NGUYEN whose telephone number is 571-272-6759. (email address is cuong.nguyen@uspto.gov). The examiner can normally be reached on 7:30 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, THOMAS G. BLACK can be reached on 571-272-6956. The Rightfax number for the

organization where this application is assigned is 571-273-6956.

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).

Please provide support, with page and line numbers, for any amended or new claim in an effort to help advance prosecution; otherwise any new claim language that is introduced in an amended or new claim may be considered as new matter, especially if the Application is a Jumbo Application.

/CUONG H. NGUYEN/
Primary Examiner
Art Unit 3661

Notice of References Cited	Application/Control No. 11/283,137		Applicant(s)/Patent Under Reexamination KOEBLER ET AL.	
	Examiner CUONG H. NGUYEN		Art Unit 3661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2007/0112475	05-2007	Koebler et al.	701/001
*	B	US-2006/0005736	01-2006	Kumar, Ajith Kuttannair	105/001.4
*	C	US-2005/0233185	10-2005	Dunn et al.	429/012
*	D	US-2004/0074682	04-2004	Fussey et al.	180/065.2
*	E	US-2002/0072838	06-2002	McClellan et al.	701/35
*	F	US-7,321,354	01-2008	Jacobsen et al.	345/102
*	G	US-7,243,246	07-2007	Allen et al.	713/300
*	H	US-6,522,955	02-2003	Colborn, Jeffrey A.	700/286
*	I	US-6,470,240	10-2002	Haynes et al.	701/1
*	J	US-6,266,588	07-2001	McClellan et al.	701/35
*	K	US-2006/0029296	02-2006	King et al.	382/313
*	L	US-2005/0052290	03-2005	Naden et al.	340/993
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
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	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

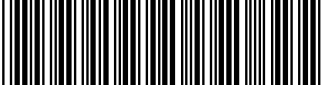
Index of Claims 	Application/Control No.		Applicant(s)/Patent under Reexamination	
	11/283,137		KOEBLER ET AL.	
	Examiner		Art Unit	
	CUONG H. NGUYEN		3661	

✓	Rejected	—	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
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Claim		Date									
Final	Original	6/14/09									
	1	✓									
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Search Notes 	Application/Control No.		Applicant(s)/Patent under Reexamination	
	11/283,137		KOEHLER ET AL.	
	Examiner		Art Unit	
	CUONG H. NGUYEN		3661	

SEARCHED			
Class	Subclass	Date	Examiner
701	1,200	6/14/2009	CHN
105	1.4	6/14/2009	CHN
180	65.21	6/14/2009	CHN
340	438	6/14/2009	CHN
713	300	6/14/2009	CHN

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
WEST/DERWENT	6/14/2009	CHN
PG PUBS	6/14/2009	CHN
Inventors'names	6/14/2009	CHN
IEEE Xplore	6/14/2009	CHN

Receipt date: 12/10/2007

11283137 - GAU: 3661

Modified Version of PTO/SB/08A (Substitute for Form 1449/PTO)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS			Application Number	11/283137	
			Filing Date	11/17/2005	
			First Named Inventor	Martin Koebler	
			Art Unit	3661	
			Examiner Name	Nguyen, Cuong H	
Sheet	2	of	3	Attorney Docket Number	MTS-101/US

US Patent Documents					
Examiner Initials	Cite No.	Document Number Number/Kind Code	Publication Date mm-dd-yyyy	Name	Relevant Information
/CHN/	A	US- 4347496	08/31/1982	Kubalak et al.	
	B	US- 4459671	07/10/1984	Teass et al.	
	C	US- 5315977	05/31/1994	Fossen	
	D	US- 5929609	07/27/1999	Joy et al.	
	E	US- 5999864	12/07/1999	Thiel et al.	
	F	US- 6064937	05/16/2000	Yang	
	G	US- 6307277	10/23/2001	Tamai et al	
	H	US- 6370472	04/09/2002	Fosseen	
	I	US- 6427107	07/30/2002	Chiu et al	
	J	US- 6465908	10/15/2002	Karuppana et al	
	K	US- 6522955	02/18/2003	Colborn	
	L	US- 6662642	12/16/2003	Breed et al	
	M	US- 6701897	03/09/2004	Chatfield	
	N	US- 6809429	10/26/2004	Frank	
	O	US- 6838858	01/04/2005	Berneis et al	

Foreign Patent Documents						
Examiner Initials	Cite No.	Document Number Country/Number/Kind Code	Publication Date mm-dd-yyyy	Name	Relevant Information	T

Examiner	/Cuong Nguyen/ (06/17/2009)	Date Considered	
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* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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 USC 122 and 37 CFR 1.11 and 1.14.

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /CHN/ (06/17/2009)

11283137 - GAU: 3661

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS	Application Number	11/283137
	Filing Date	11/17/2005
	First Named Inventor	Martin Koebler
	Art Unit	3661
	Examiner Name	Nguyen, Cuong H
Sheet <u>3</u> of <u>4</u>	Attorney Docket Number	MTS-101/US

US Patent Documents						
Examiner Initials	Cite No.	Document Number <i>Number/Kind Code</i>	Publication Date <i>mm-dd-yyyy</i>	Name	Relevant Information	
/CHN/	A	US- 6847189	01/25/2005	Frank		
↓ ↓	B	US- 6877488	04/12/2005	Washeleski et al		
	C	US- 6928344	08/09/2005	McWalter et al		
	D	US- 2004/0133336	07/08/2004	Fosseen		
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Examiner Initials	Cite No.	Document Number <i>Country/Number/Kind Code</i>	Publication Date <i>mm-dd-yyyy</i>	Name	Relevant Information	T

Examiner	/Cuong Nguyen/ (06/17/2009)	Date Considered	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /CHN/ (06/17/2009)

Modified Version of PTO/SB/08B (Substitute for Form 1449/PTO)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS		Application Number	11/283137
		Filing Date	11/17/2005
		First Named Inventor	Martin Koebler
		Art Unit	3661
		Examiner Name	Nguyen, Cuong H
Sheet	4	of	4
		Attorney Docket Number	MTS-101/US

Non Patent Literature Documents			
Examiner Initials	Cite No.	Name (IN CAPITALS), Title, Date, Pages, Volume-Issue, Publisher, City, Country	T
/CHN/	A	HIBBS, "GM Sunraycer Case History/M101 lecture 2-2", 12/01/1990, pages 1-37, Society for Automotive Engineers, Inc., Warrendale, USA	
	B	CASSIDY et al, "GM Sunraycer Case History/M101 lecture 4-1", 12/01/1990, pages 1-61, Society for Automotive Engineers, Inc., Warrendale, USA	
	C	LOVINS et al, "Winning the Oil Endgame", 03/01/2005, page 50, Rocky Mountain Institute, Snowmass, USA	
	D	ROCHE et al, "The Speed of Light, The 1996 World Solar Challenge", 1997, pages 43-46 & 189-194, UNSW	
	E	"Answers.com", pages 1-7, Answers.com, http://www.answers.com/topic/drag-coefficient-1	
↓	F	"Cell Specification Data", pages 1-2, Kokam Co., Ltd., http://www.kokam.com/product/product_pdf/high_power/PL-301_SLPB60460330H_70Ah_Grade.pdf	
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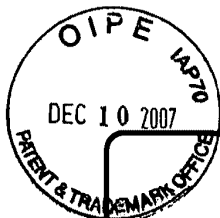
Examiner	/Cuong Nguyen/ (06/17/2009)	Date Considered	
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SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /CHN/ (06/17/2009)



Modified Version of PTO/SB/21

1/2

TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	11/283137
	Filing Date	11/17/2005
	First Named Inventor	Martin Koebler
	Art Unit	3661
	Examiner Name	Nguyen, Cuong H
Total Number of Pages in This Submission	Attorney Docket Number	MTS-101/US

ENCLOSURES (Check all that apply)			
☐ Fee Transmittal Form	☐ Drawings	☐ After Allowance Comm. to TC	
☐ Fee Attached	☐ Licensing-related papers	☐ Appeal Comm. to Board of Appeals and Interferences	
☐ Amendment/Reply	☐ Petition	☐ Appeal Comm. to TC (Appeal Notice, Brief, Reply Brief)	
☐ After Final	☐ Petition to Convert to a Provisional Application	☐ Proprietary Information	
☐ Affidavits/Declaration(s)	☒ Power of Attorney, Revocation Change of Corresp. Address	☐ Status Letter	
☐ Extension of Time Request	☐ Terminal Disclaimer	☒ Other (Specified below)	
☐ Express Abandonment Request	☐ Request for Refund		
☒ Information Disclosure Statement	☐ CD, Number of CD(s) _____		
☐ Certified Copy of Priority Doc(s)	☐ Landscape Table on CD		
☐ Reply to Missing Parts/Incomplete Application	Other: Cited References		
☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53			
SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
FIRM NAME	LUMEN INTELLECTUAL PROPERTY SERVICES, Inc.		
SIGNATURE	/ Trieu T. Mai / Reg.No. 61,354		
PRINTED NAME	Trieu T. Mai		
DATE	12/5/07	REGISTRATION NUMBER	61,354

CERTIFICATE OF TRANSMISSION/MAILING	
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below:	
SIGNATURE	/ Samira Uddin /
PRINTED NAME	Samira Uddin
DATE	12/5/07

This collection of information is required by 37 CFR 1.51. 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 USC 122 and 37 CFR 1.11 and 1.14.
SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



Lumen IDS Transmittal

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS	Application Number	11/283137
	Filing Date	11/17/2005
	First Named Inventor	Martin Koebler
	Art Unit	3661
	Examiner Name	Nguyen, Cuong H
Sheet 1 of 3	Attorney Docket Number	MTS-101/US

This is a submission of a completed IDS and copies of the pertinent parts of the references cited herein. It is requested that the document(s) on the enclosed form(s) be made of record in the above-identified application.

Part I Authority

This statement is filed pursuant to:

- ☒ 37 CFR 1.97(b). This IDS is filed either (1) within three months of the filing date of the national application; (2) within three months of the date of entry of the national stage as set forth in 37 CFR 1.491 in an international application; (3) before the mailing date of a first office action on the merits, or (4) before the mailing of a first office action after the filing of an RCE under 37 CFR 1.114, whichever event occurs last. Accordingly, this IDS requires no fee and no certification.
- ☐ 37 CFR 1.97(c). This IDS is filed after the period specified in 37 CFR 1.97(b), but before the mailing date of either (1) a final office action under 37 CFR 1.113 or (2) a notice of allowance under 37 CFR 1.311. Accordingly, this IDS requires either the fee specified in 37 CFR 1.17(p) for submission of an IDS under 37 CFR 1.97(c), or a certification according to 37 CFR 1.97(e).
- ☐ 37 CFR 1.97(d). This IDS is filed after the period specified in 37 CFR 1.97(c). Accordingly, this IDS requires the fee specified in 37 CFR 1.17(p) for submission of an IDS under 37 CFR 1.97(d), and a certification according to 37 CFR 1.97(e).

Conditional Petition

It is respectfully requested that this IDS be considered, good cause presented in Part III herein (certification). Please treat this paper as the required petition or as conditional petition to the extent required for acceptance of the IDS. If this IDS crosses in the mail with an office action, or is otherwise not in the indicated category of 37 CFR 1.97, it is respectfully requested that this IDS be treated in the next appropriate category and made of record.

Part II Payment

- ☒ No fee is due
- ☐ The fee specified in 37 CFR 1.17(p) for submission of an IDS under 37 CFR 1.97(c), (d) or (e) is enclosed.

Part III Certification

- ☒ Pursuant to 37 CFR 1.97(e), I certify that no certification is necessary.
- ☐ Pursuant to 37 CFR 1.97(e), I certify that each item of information contained in the IDS was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the IDS.
- ☐ Pursuant to 37 CFR 1.97(e), I certify that no item of information contained in the IDS was cited in a communication from a foreign patent office in a counterpart foreign application, or, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 CFR 1.56(c), more than three months prior to the filing of the IDS.

Part IV Additional Statement

An additional statement regarding these items of information () is, () is not, enclosed. Copies of the cited documents () are enclosed, () are of record in the parent application with serial No. and will be provided if the Examiner deems it convenient.

Respectfully submitted, / Trieu T. Mai / Reg.No. 61,354

Trieu T. Mai	TELEPHONE	650-424-0100
12/5/07	REGISTRATION NUMBER	61,354

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS			Application Number	11/283137	
			Filing Date	11/17/2005	
			First Named Inventor	Martin Koebler	
			Art Unit	3661	
			Examiner Name	Nguyen, Cuong H	
Sheet	2	of	3	Attorney Docket Number	MTS-101/US

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	A	US- 4347496	08/31/1982	Kubalak et al.		
	B	US- 4459671	07/10/1984	Teass et al.		
	C	US- 5315977	05/31/1994	Fossen		
	D	US- 5929609	07/27/1999	Joy et al.		
	E	US- 5999864	12/07/1999	Thiel et al.		
	F	US- 6064937	05/16/2000	Yang		
	G	US- 6307277	10/23/2001	Tamai et al		
	H	US- 6370472	04/09/2002	Fosseen		
	I	US- 6427107	07/30/2002	Chiu et al		
	J	US- 6465908	10/15/2002	Karuppana et al		
	K	US- 6522955	02/18/2003	Colborn		
	L	US- 6662642	12/16/2003	Breed et al		
	M	US- 6701897	03/09/2004	Chatfield		
	N	US- 6809429	10/26/2004	Frank		
	O	US- 6838858	01/04/2005	Berneis et al		
Foreign Patent Documents						
Examiner Initials	Cite No.	Document Number Country/Number/Kind Code	Publication Date mm-dd-yyyy	Name	Relevant Information	T

Examiner		Date Considered	
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* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.
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 USC 122 and 37 CFR 1.11 and 1.14.
SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS		Application Number	11/283137		
		Filing Date	11/17/2005		
		First Named Inventor	Martin Koebler		
		Art Unit	3661		
		Examiner Name	Nguyen, Cuong H		
Sheet	3	of	4	Attorney Docket Number	MTS-101/US

US Patent Documents					
Examiner Initials	Cite No.	Document Number Number/Kind Code	Publication Date mm-dd-yyyy	Name	Relevant Information
	A	US- 6847189	01/25/2005	Frank	
	B	US- 6877488	04/12/2005	Washeleski et al	
	C	US- 6928344	08/09/2005	McWalter et al	
	D	US- 2004/0133336	07/08/2004	Fosseen	
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Foreign Patent Documents						
Examiner Initials	Cite No.	Document Number Country/Number/Kind Code	Publication Date mm-dd-yyyy	Name	Relevant Information	T

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

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 USC 122 and 37 CFR 1.11 and 1.14.

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT IDS	Application Number	11/283137
	Filing Date	11/17/2005
	First Named Inventor	Martin Koebler
	Art Unit	3661
	Examiner Name	Nguyen, Cuong H
Sheet <u>4</u> of <u>4</u>	Attorney Docket Number	MTS-101/JS

Non Patent Literature Documents			
Examiner Initials	Cite No.	Name (IN CAPITALS), Title, Date, Pages, Volume-Issue, Publisher, City, Country	T
	A	HIBBS, "GM Sunraycer Case History/M101 lecture 2-2", 12/01/1990, pages 1-37, Society for Automotive Engineers, Inc., Warrendale, USA	
	B	CASSIDY et al, "GM Sunraycer Case History/M101 lecture 4-1", 12/01/1990, pages 1-61, Society for Automotive Engineers, Inc., Warrendale, USA	
	C	LOVINS et al, "Winning the Oil Endgame", 03/01/2005, page 50, Rocky Mountain Institute, Snowmass, USA	
	D	ROCHE et al, "The Speed of Light, The 1996 World Solar Challenge", 1997, pages 43-46 & 189-194, UNSW	
	E	"Answers.com", pages 1-7, Answers.com, http://www.answers.com/topic/drag-coefficient-1	
	F	"Cell Specification Data", pages 1-2, Kokam Co., Ltd., http://www.kokam.com/product/product_pdf/high_power/PL-301_SLPB60460330H_70Ah_Grade.pdf	
	G		

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

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 USC 122 and 37 CFR 1.11 and 1.14.

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

General Power of Attorney

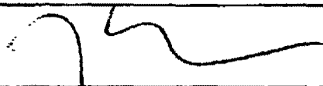
GENERAL POWER OF ATTORNEY**and****CORRESPONDENCE ADDRESS INDICATION FORM****GENERAL POWER OF ATTORNEY**

I am duly authorized to sign this instrument on behalf of the Assignee.

By submission of this paper in connection with any matter of the Assignee for which an assignment to Assignee of the entire right, title and interest is submitted concurrently for recording or was previously recorded, thereby establishing authority of Assignee to act under 37 CFR 3.73(b), I hereby:

1. Revoke any previous powers of attorney with respect to that matter,
2. Appoint the registered practitioners associated with customer number 30869, assigned to LUMEN Intellectual Property Services, to represent Assignee before the United States Patent and Trademark Office (USPTO) in that matter, such appointment to be to the exclusion of the inventor(s) and representative(s) of the inventor(s) in accordance with 37 CFR 3.71, and
3. Request that the correspondence address for that matter be recognized or changed to the correspondence address of the customer number 30869 of appointed representative.

SIGNATURE OF ASSIGNEE

SIGNATURE	
DATE	11-13-07
PRINTED NAME	Nicole G. Goldstein
TITLE	President & CEO
ASSIGNEE	Motility Systems 188 Alta Mesa Road Woodside, CA 94062

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 USC 122 and 37 CFR 1.11 and 1.14. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



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OFFICE OF PETITIONS

**MORRISON & FOERSTER LLP
755 PAGE MILL RD
PALO ALTO, CA 94304-1018**

In re Application of :
Martin KOEBLER, et al :
Application No. 11/283,137 :
Filed: November 17, 2005 :
Attorney Docket No. 601392000100 :

DECISION ON PETITION
TO WITHDRAW
FROM RECORD

This is a decision on the Request to Withdraw as attorney or agent of record under 37 C.F.R. § 1.36(b), filed November 1, 2007.

The request is **APPROVED**.

A grantable request to withdraw as attorney/agent of record must be signed by every attorney/agent seeking to withdraw or contain a clear indication that one attorney is signing on behalf of another/others. A request to withdraw will not be approved unless at least 30 (thirty) days would remain between the date of approval and the later of the expiration date of a time to file a response or the expiration date of the maximum time period which can be extended under 37 C.F.R. § 1.136(a).

The request was signed by Thomas E. Ciotti on behalf of all attorneys/agents of record.

All attorneys/agents of have been withdrawn.

Applicant is reminded that there is no attorney of record at this time.

The request to change the correspondence of record is not acceptable as the requested correspondence address is not that of: (1) the first named signing inventor; or (2) an intervening assignee of the entire interest under 37 C.F.R. 3.71. All future communications from the Office will be directed to the assignee of the entire interest at the first copied address below until otherwise properly notified by the applicant.

There are no outstanding Office actions pending at the present time.

Telephone inquiries concerning this decision should be directed to Diane Goodwyn at 571-272-6735.


April Wise
Petitions Examiner
Office of Petitions

cc: MOTILITY SYSTEMS, INC.
188 ALTA MESA ROAD
WOODSIDE, CA 94062

cc: DR. RON JACOBS
LUMEN IP SERVICES
2345 YALE STREET, SECOND FLOOR
PALO ALTO, CA 94306



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/283,137	11/17/2005	Martin Koebler	601392000100

25226
MORRISON & FOERSTER LLP
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PALO ALTO, CA 94304-1018

CONFIRMATION NO. 3291
POWER OF ATTORNEY NOTICE



Date Mailed: 11/30/2007

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/01/2007.

- The withdrawal as attorney in this application has been accepted. Future correspondence will be mailed to the new address of record. 37 CFR 1.33.

/dcgoodwyn/

Office of Initial Patent Examination (571) 272-4000 or 1-800-PTO-9199



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Bib Data Sheet

CONFIRMATION NO. 3291

SERIAL NUMBER 11/283,137	FILING OR 371(c) DATE 11/17/2005 RULE	CLASS 701	GROUP ART UNIT 3661	ATTORNEY DOCKET NO.	
APPLICANTS Martin Koebler, Saal/Donau, GERMANY; Nicole G. Goldstein, Woodside, CA; Stephen J. Brown, Woodside, CA; Jason H. Harper, Pleasanton, CA;					
** CONTINUING DATA ***** ** FOREIGN APPLICATIONS *****					
IF REQUIRED, FOREIGN FILING LICENSE GRANTED** SMALL ENTITY ** ** 12/21/2005					
Foreign Priority claimed ☐ yes ☐ no 35 USC 119 (a-d) conditions ☐ yes ☐ no ☐ Met after met Allowance Verified and Acknowledged _____ Examiner's Signature Initials		STATE OR COUNTRY GERMANY	SHEETS DRAWING 14	TOTAL CLAIMS 22	INDEPENDENT CLAIMS 3
ADDRESS MOTILITY SYSTEMS, INC. 188 ALTA MESA ROAD WOODSIDE, CA94062					
TITLE Power management systems and devices					
FILING FEE RECEIVED 550	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/283,137	11/17/2005	Martin Koebler	601392000100

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755 PAGE MILL RD
PALO ALTO, CA 94304-1018

CONFIRMATION NO. 3291
POWER OF ATTORNEY NOTICE



Date Mailed: 11/30/2007

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/01/2007.

- The withdrawal as attorney in this application has been accepted. Future correspondence will be mailed to the new address of record. 37 CFR 1.33.

/dcgoodwyn/

Office of Initial Patent Examination (571) 272-4000 or 1-800-PTO-9199

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FACSIMILE: 650.494.0792

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DENVER, NORTHERN VIRGINIA,
ORANGE COUNTY, SACRAMENTO,
WALNUT CREEK, CENTURY CITY
TOKYO, LONDON, BEIJING,
SHANGHAI, HONG KONG,
SINGAPORE, BRUSSELS

To:

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FROM: THOMAS E. CIOTTI

DATE: OCTOBER 31, 2007

Number of pages with cover page:	3	Originals Will Not Follow
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Preparer of this slip has confirmed that facsimile number given is correct: **LDS4/11641**

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Comments:

Atty Docket No: 60139-20001.00
Application Serial No.: 11/283,137
Filed: November 17, 2005
Inventors: Martin KOEBLER *et al.*
Art Unit: 3661
Examiner: C. Nguyen
Title: POWER MANAGEMENT SYSTEMS AND DEVICES

Enclosed are the following documents:

1. Transmittal – 1 page
2. Request for Withdrawal as Attorney or Agent and Change of Correspondence Address – 1 page

**IF YOU DO NOT RECEIVE ALL OF THE PAGES, PLEASE CALL
LINDSAY SEYDEL AT (650) 813-5827 AS SOON AS POSSIBLE**

PA-1205295

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PTO/SB/21 (07-06)

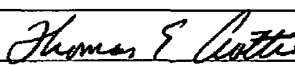
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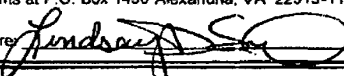
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>		Application Number	11/283,137
		Filing Date	November 17, 2005
		First Named Inventor	Martin KOEBLER
		Art Unit	3661
		Examiner Name	C. Nguyen
Total Number of Pages in This Submission	2	Attorney Docket Number	601392000100

ENCLOSURES (Check all that apply)		
☐ Fee Transmittal Form ☐ Fee Attached ☐ Amendment/Reply ☐ After Final ☐ Affidavits/declaration(s) ☐ Extension of Time Request ☐ Express Abandonment Request ☐ Information Disclosure Statement ☐ Certified Copy of Priority Document(s) ☐ Reply to Missing Parts/Incomplete Application ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53	☐ Drawing(s) ☐ Licensing-related Papers ☐ Petition ☐ Petition to Convert to a Provisional Application ☐ Power of Attorney, Revocation, Change of Correspondence Address ☐ Terminal Disclaimer ☐ Request for Refund ☐ CD, Number of CD(s) _____ ☐ Landscape Table on CD	☐ After Allowance Communication to TC ☐ Appeal Communication to Board of Appeals and Interferences ☐ Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) ☐ Proprietary Information ☐ Status Letter ☒ Other Enclosure(s) (please identify below): 1. Request for Withdrawal as Attorney or Agent and Change of Correspondence Address - 1 page
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT		
Firm Name	MORRISON & FOERSTER LLP	
Signature		
Printed name	Thomas E. Ciotti	
Date	October 31, 2007	Reg. No. 21,013

I hereby certify that this correspondence is being transmitted via facsimile (fax no. 571-273-8300) to the USPTO Commissioner for Patents at P.O. Box 1450 Alexandria, VA 22313-1140	
Dated: October 31, 2007	Signature:  (Lindsay Seydel)

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REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS	Application Number	11/283,137
	Filing Date	November 17, 2005
	First Named Inventor	Martin KOEBLER
	Art Unit	3661
	Examiner Name	C. Nguyen
	Attorney Docket Number	601392000100

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

Please withdraw me as attorney or agent for the above identified patent application, and

- ☒ all the attorneys/agents of record.
☐ the attorneys/agents (with registration numbers) listed on the attached paper(s), or
☐ the attorneys/agents associated with Customer Number

NOTE: This box can only be checked when the power of attorney of record in the application is to all the practitioners associated with a customer number.

The reasons for this request are:
Per client's request

CORRESPONDENCE ADDRESS

1. ☐ The correspondence address is NOT affected by this withdrawal.
 2. ☒ Change the correspondence address and direct all future correspondence to:

☐ The address associated with Customer Number:

OR

☒ Firm or Individual Name	Dr. Ron Jacobs Lumen IP Services		
Address	2345 Yale Street, Second Floor		
City	Palo Alto	State	CA
Country	U.S.A.		
Telephone	1-888-475-8636	Email	admin@lumen.com
Signature	<i>Thomas E. Ciotti</i>		
Name	Thomas E. Ciotti	Registration No.	
Date	October 31, 2007	Telephone No.	(650) 813-5702

NOTE: Withdrawal is effective when approved rather than when received. Unless there are at least 30 days between approval of withdrawal and the expiration date of a time period for response or possible extension period, the request to withdraw is normally disapproved.

I hereby certify that this correspondence is being transmitted via facsimile (fax no. 571-273-8300) to the USPTO Commissioner for Patents at P.O. Box 1450 Alexandria, VA 22313-1140

Dated: October 31, 2007

Signature *Lindsay Seydel* (Lindsay Seydel)

pa-1205318



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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/283,137	11/17/2005	Martin Koebler	601392000100

CONFIRMATION NO. 3291

25226
MORRISON & FOERSTER LLP
755 PAGE MILL RD
PALO ALTO, CA94304-1018

Title: Power management systems and devices

Publication No. US-2007-0112475-A1

Publication Date: 05/17/2007

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.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 703-305-3028.

Pre-Grant Publication Division, 703-605-4283

17224 U.S. PTO
111705

PTO/SB/05 (05-05)
Approved for use through 07/31/2006. OMB 0651-0032
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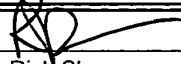
UTILITY PATENT APPLICATION TRANSMITTAL (ONLY FOR NEW NONPROVISIONAL APPLICATIONS UNDER 37 CFR 1.53(B))	Attorney Docket No. 601392000100	
	First Inventor Martin KOEBLER	
	Title POWER MANAGEMENT SYSTEMS AND DEVICES	
	Express Mail Label No. EV 595535421 US	

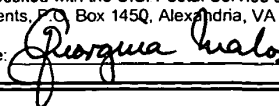
APPLICATION ELEMENTS See MPEP chapter 600 concerning utility patent application contents.	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450
---	---

1. ☒ Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original and a duplicate for fee processing) (2 pages) 2. ☒ Applicant claims small entity status. See 37 CFR 1.27. 3. ☒ Specification [Total Pages 46] Both the claims and abstract must start on a new page (For information on the preferred arrangement, see MPEP 608.01(a)) 4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 14] 5. Oath or Declaration [Total Sheets 4] a. ☒ Newly executed (original or copy) b. ☐ A copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional with Box 18 completed) i. ☐ DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b). 6. ☒ Application Data Sheet. See 37 CFR 1.76 (3 pages) 7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix) ☐ Landscape Table on CD 8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, items a. - c. are required) a. Computer Readable Form (CRF) i. ☐ Computer Readable Form (CRF) ii. ☐ Transfer Request (37 CFR 1.821(e)) b. Specification Sequence Listing on: i. ☐ CD-ROM or CD-R (2 copies); or ii. ☐ Paper c. ☐ Statements verifying identity of above copies	9. ☒ Assignment Papers (cover sheet & document(s)) (6 pages) Name of Assignee: Motility Systems, Inc. 10. ☒ 37 CFR 3.73(b) Statement (when there is an assignee) (plus copy of Assignment) (6 pages) ☒ Power of Attorney (1 page) 11. ☐ English Translation Document (if applicable) 12. ☐ Information Disclosure Statement (PTO/SB/08 or PTO-1449) ☐ Copies of foreign patent documents, publications, & other information 13. ☐ Preliminary Amendment 14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized) 15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) 16. ☐ Nonpublication Request under 35 U.S.C.122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent. 17. ☐ Other:
--	--

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:
☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____
Prior application information: Examiner _____ Art Unit: _____

19. CORRESPONDENCE ADDRESS			
☒ The address associated with Customer Number: 25226 OR ☐ Correspondence address below			
Name			
Address			
City	State	Zip Code	
Country	Telephone	Email Address	

Signature		Date	November 17, 2005
Name (Print/Type)	Rick Shoop	Registration No. (Attorney/Agent)	45,763

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail, Airbill No. EV 595535421 US, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.	
Dated: November 17, 2005	Signature:  (Georgina Matos)

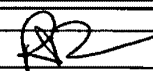
pa-1026284

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<i>Effective on 12/08/2004.</i> <i>Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).</i> FEE TRANSMITTAL For FY 2005				Complete if Known	
☒ Applicant claims small entity status. See 37 CFR 1.27				Application Number	Not Yet Assigned
				Filing Date	Concurrently Herewith
				First Named Inventor	Martin KOEBLER
				Examiner Name	Not Yet Assigned
				Art Unit	Not Yet Assigned
TOTAL AMOUNT OF PAYMENT		(\$) 590.00		Attorney Docket No.	601392000100

METHOD OF PAYMENT (check all that apply)	
☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____	
☒ Deposit Account Deposit Account Number: <u>03-1952</u> Deposit Account Name: <u>Morrison & Foerster LLP</u>	
For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)	
☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee	
☒ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments	

FEE CALCULATION							
1. BASIC FILING, SEARCH, AND EXAMINATION FEES							
Application Type	Fee (\$)	Small Entity	Fee (\$)	Small Entity	Fee (\$)	Small Entity	Fees Paid (\$)
		Fee (\$)		Fee (\$)		Fee (\$)	
Utility	300	150	500	250	200	100	500.00
Design	200	100	100	50	130	65	0.00
Plant	200	100	300	150	160	80	0.00
Reissue	300	150	500	250	600	300	0.00
Provisional	200	100	0	0	0	0	0.00
2. EXCESS CLAIM FEES							
Fee Description							Small Entity Fee (\$)
Each claim over 20 (including Reissues)							50
Each independent claim over 3 (including Reissues)							200
Multiple dependent claims							360
Total Claims Extra Claims Fee (\$)							Multiple Dependent Claims
22 - 20 = 2 x 25.00 = 50.00							Fee (\$)
							Fee Paid (\$)
							180.00
							0.00
Indep. Claims Extra Claims Fee (\$)							Fee Paid (\$)
3 - 3 = 0 x 100.00 = 0.00							
3. APPLICATION SIZE FEE							
If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 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).							
Total Sheets Extra Sheets Number of each additional 50 or fraction thereof Fee (\$)							Fee Paid (\$)
60 - 100 = 0 /50 0 (round up to a whole number) x 125.00 =							0.00
4. OTHER FEE(S)							
Non-English Specification, \$130 fee (no small entity discount)							
Other (e.g., late filing surcharge): 8021 Recording each patent assignment, agreement or ...							40.00

SUBMITTED BY			
Signature		Registration No. (Attorney/Agent)	45,763
Name (Print/Type)	Rick Shoop	Telephone	(650) 813-5804
		Date	November 17, 2005

POWER MANAGEMENT SYSTEMS AND DEVICES

BACKGROUND OF THE INVENTION

[0001] Currently, drivers of automotive vehicles have only very imprecise methods for managing the fuel consumption of their cars. For example, drivers can slow down, they can brake lightly, and they can carry lighter loads. Generally, however, fuel consumption cannot be precisely controlled by the driver. More accurate and precise control of fuel consumption is one of the best ways to improve the energy efficiency of most cars. In particular, accurate control of fuel consumption may optimize the energy efficiency of a car.

[0002] It has been shown that you can reduce fuel usage by efficient driving. According to Amory Lovins of the Rocky Mountain Institute, a 35% improvement in miles per gallon (mpg) for all 2001 vehicles (whose overall average mpg was 20) would have reduced oil use in the United States by 2.7 Mbbl/d, approximately the same amount that the U.S. imported from the Gulf. See, for example, "Winning the Oil Endgame," Rocky Mountain Institute, 2004. p.50. Empirical evidence also supports the assertion that efficient driving can reduce fuel usage. For example, the Honda Insight™, a car available to the general public that normally gets 60 mpg, broke records in 2000 by getting 102 miles per gallon in a 7-day drive around the circumference of Britain. The team responsible did this purely by driving more efficiently, and not by modifying the car in any manner.

[0003] In most automotive vehicles, an operator controls the power applied to the vehicle (e.g., the engine of the vehicle) by operating the ignition, break and gas pedals. Additional control is typically provided by operational assisting devices, such as a cruise control, that help to keep the vehicle at a constant speed, or within a range of speeds. However, such operational assisting devices typically do not optimize the power consumption of the vehicle, or control the speed and/or power provided to the vehicle based on an optimal power consumption level.

[0004] Many parameters may impact the optimal power consumption of a vehicle, including external factors (e.g., forces and conditions that act on the vehicle), internal conditions (e.g., the current status of the vehicle and its component parts.), operator commands (e.g., control commands from the operator driving or preparing to drive the vehicle), and operational parameters of the vehicle (e.g., performance capabilities of the vehicle based on the make and model and/or the component parts of the vehicle, as well as the historical performance of the vehicle).

[0005] In recent years the need for energy efficient vehicles has increased as the cost and availability of traditional fossil fuels has fluctuated. However, the need for fuel efficiency spans all types of vehicles, including currently available vehicles (e.g., internal combustion, solar, electric, and hybrid vehicles), as well as vehicles proposed or under development (e.g., hydrogen fuel cell vehicles and other electrically-fueled vehicles). In all of these types of vehicles, the overall fuel efficiency (regardless of the type of fuel), can be improved by optimizing the power supplied to the engine. As described herein, energy efficiency may be fuel efficiency or power efficiency. Energy supplied to the vehicle (e.g., the engine) may come from any appropriate source (e.g., gas, solar, battery, hydrogen, ethanol, etc.).

[0006] Thus, there is a need for devices and systems for controlling the power applied to a vehicle engine. The devices, systems and methods described herein address many problems identified for controlling the power supplied to automotive engines raised above.

BRIEF SUMMARY OF THE INVENTION

[0007] Described herein are devices, systems, and methods for managing the power consumption of an automotive vehicle, and thereby for optimizing the power consumption of the vehicle. The devices and systems for managing the power consumption of the vehicle typically include power management logic that can calculate an applied power for the vehicle engine based on information provided from the external environment of the vehicle, the operational status of the vehicle, one or more command inputs from a driver, and one or more operational parameters of the vehicle. The information provided to the power management logic may come from data inputs (e.g., sensors, telemetries, etc.), memory, user commands, or it may be derived. The power management logic may comprise software, hardware, or any combination of software or hardware.

In some variations, the devices and systems include a processor (e.g., a microprocessor) that can perform the power management logic, and provide an applied power. The applied power that is determined by the power management logic may be used to control the vehicle engine. For example, the power management logic may be used by a motor control mechanism to control the application of power to the vehicle engine as the vehicle travels along a route (either a predetermined or a non-predetermined route). The applied power may also be expressed as an optimized speed or speeds to which the vehicle is controlled. For example, the motor control mechanism may adjust the speed of the vehicle to an optimized speed or speeds as the vehicle travels. Or, the device or system may provide a suggested fuel-efficient speed to the driver, who in turn will manually adjust his/her speed. Thus, the devices, systems, and methods described herein may optimize the power consumption of an automotive vehicle by controlling the final speed of the vehicle, for example, by controlling the power applied to the vehicle motor.

[0008] The system may be manually engaged by the operator either when the vehicle is turned on, or in the midst of a trip (e.g., “on the fly”). In one variation, the operator sets a preferred speed, and a range at which to manage that speed (e.g., the preferred speed may be 60 mph, and the range can be 5 mph) over at least a portion of the trip. The system may determine an optimal (e.g., fuel efficient) speed within the range selected. By calculating and then averaging the efficient speed over a given route, the system can optimize energy usage within the driver’s stated speed and range. The power management logic may determine energy efficiency over the course of a trip, based on current location and destination. The destination of the driver does not have to be known (e.g., input into a GPS or other similar system by the driver). The system (e.g., anticipated destination logic) may infer the driver’s destination based on a subset of the information inputs to the system, such as the time of day, current location, previous driving habits, and other inputs. In some variations, the driver can manually accelerate (e.g., override the system) for passing, braking and the like. In some variations, the device or system may provide a suggested speed to the driver to match, in order for the driver to better optimize power usage.

[0009] In some variations, the system is automatically enabled whenever the vehicle is turned on. In this case, the operator of the vehicle does not have to set any a destination, target speed or range, or the like. By automatically monitoring the operator’s real-time speed, braking and

acceleration, and by utilizing applicable inputs (e.g., from sensors and/or from a database), the power management system may determine the most efficient speed to travel a route. In some variations, the device or system may adjust the vehicle speed automatically. The power management devices or systems described herein may operate whether or not the driver has entered a destination into the GPS, because the system may infer the destination based on previous driving habits if the driver has not explicitly provided a destination.

[0010] In some variations, the driver (or other user) provides the system a destination and the vehicle determines the optimal speeds to drive throughout the route. The system may use speed limits, traffic conditions, physical calculations, and statistical models from previous trips to the same destination to select the target speeds to optimize around. Thus, in some variations, the driver only needs to steer, although hard acceleration or braking by the driver may override the system.

[0011] Described herein are devices for managing the power consumption of an automotive vehicle comprising a power management logic operable to calculate an applied power for the vehicle engine from information about the external environment of the vehicle, information about the operational status of the vehicle, one or more command inputs, and one or more operational parameters of the vehicle. The power management device may also include a processor responsive to the power management logic (e.g., a microprocessor), and a motor control mechanism, wherein the motor control mechanism controls the application of power to the vehicle engine.

[0012] The power management logic may determine an applied power for the vehicle engine based on information about the external environment of the vehicle that is selected from the group consisting of: the current location of the vehicle, the elevation of the vehicle, upcoming elevations of the vehicle, the current slope/grade of the route, the predicted slope/grade of the next segments (or upcoming segments) of the route, the condition of the known or predicted route (or a portion thereof), traffic surrounding the vehicle, the location of stoplights, the timing of stoplights, a map of the roadway, the present angle of the sun, the predicted angle of the sun for upcoming route segments, the weather around the vehicle, present wind direction, the predicted wind direction for upcoming route segments, present wind velocity, the predicted wind velocity for upcoming route

segments, current temperature, the predicted temperature for upcoming route segments, current air pressure, predicted air pressure for upcoming route segments, time of day, date, day of week, visibility, present road conditions, predicted road conditions for upcoming route segments, and the distance from other vehicles. Any of this information may be acquired by measuring (e.g., from sensors), or it may be detected or input (e.g., from manual inputs, telemetry, detectors, a memory, etc.), or it may be derived (e.g., based on other information, including other environmental information).

[0013] The power management logic may determine an applied power for the vehicle engine based on information about the operational status of the vehicle. The operational status information input may be selected from the group consisting of: the vehicle's current speed, the motor speed, the vehicle's current orientation, the RPM of the vehicle's motor, wheel rotations per minute, the battery state, the voltage of the battery, the amp hours from the battery, the state of the battery, temperature of battery, the age of the battery, and the number of times the battery has charged and discharged, the tire pressure, the drag force due to rolling resistance of the vehicle, the weight of vehicle, the amount of air going to the engine, the amount of gas going to engine, and the weight of driver. Any of this information may be acquired by measuring (e.g., by sensors), or it may be input (e.g., from an external telemetry, a memory, etc.), or it may be derived (e.g., based on other information, including other operational status information).

[0014] The power management logic may determine an applied power for the vehicle engine based on command input information. Command input information may be selected from the group consisting of: the acceleration applied by a driver, the braking applied by a driver, the intended destination, preferred speed, maximum and minimum range over which speed should adjust, and preferred route. Any of this information may be acquired by input (e.g., from an external telemetry, keyboard, mouse, voice command, a memory, etc.), sensor (e.g., optical detectors, etc.), or it may be derived (e.g., based on other information, including other command information).

[0015] The power management logic may determine an applied power for the vehicle engine based on information about one or more operational parameters of the vehicle. Operational

parameters may be selected from the group consisting of: aerodynamic parameters (CDA), rolling resistance parameters (Crr1 and Crr2), drive train efficiency parameters, motor efficiency parameters, and battery model parameters, battery charge and discharge relationships, type of battery. Any of this information may be input (e.g., from an external telemetry, a memory, etc.), or it may be derived (e.g., based on other information, including historical information or other operational parameter information).

[0016] The power management device or system may further comprise a memory containing vehicle information about one or more operational parameters for the vehicle. The memory may store any of the information about the external environment, operational status or command inputs, including derived or historical information.

[0017] The devices and systems described herein may be used with any appropriate vehicle, including internal combustion vehicles (which run on gasoline, diesel, or ethanol for example), a hybrid internal combustion/electric vehicles, electric vehicles powered by the electric grid (plug-in), electric vehicles powered by the sun (solar), and hydrogen fuel cell vehicles.

[0018] Also described herein are systems for managing the power consumption of an automotive vehicle, comprising a first input, operable to receive information about the external environment of the vehicle, a second input, operable to receive information about the operational status of the vehicle, a third input, operable to receive one or more command inputs from a driver of the vehicle, a memory containing information about one or more operational parameters of the vehicle, power management logic operable to calculate an applied power for the vehicle engine from the first input, the second input, the third input, and the memory, and a processor responsive to the power management logic. The system may also include a motor control mechanism, wherein the motor control mechanism regulates the application of power to the vehicle engine.

[0019] Also described herein are methods of managing the power consumption of a vehicle, including calculating an applied power for the vehicle using a processor. The processor (e.g., a microprocessor, etc.) receives a first input comprising information about the environment of the vehicle, a second input comprising information about the operational status of the vehicle, a third input comprising a command input from the driver of the vehicle, and a fourth input

comprising vehicle information about the operational parameters of the vehicle. The method may also include the step of applying the applied power to the engine of the vehicle, and/or to notifying the driver of the optimal speed.

[0020] The step of calculating an applied power may include determining a route, segmenting the route into one or more segment (or intermediate) destinations, calculating an energy efficient speed for the vehicle to travel to the segment destination, determining an optimized speed for the vehicle to travel to the segment destination, and calculating the applied power from the optimized speed for all of the segments. The applied power may be calculated continuously. For example, the applied power may be calculated at each point (e.g., every segment, or points within a segment) as the vehicle is driven. Thus, over an entire route, the most energy efficient speed at which to drive may be continuously calculated. This may be done by determining a destination, and then coming up with a route for that destination. If the destination is not known (e.g., has not been provided to the power management device or system), a predicted destination may be estimated, based on statistical destination logic (e.g., using map coordinates, and the historical operation of the vehicle). Energy efficient speeds for current and upcoming route segments can then be calculated based on the route. In some variations, the route is divided up into segments. In some variations, the optimized speed for the vehicle is determined based on historical speeds for similar destinations. The route can be revised (e.g., continuously revised) during operation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] FIGS. 1A and 1B show an example of a vehicle controlled by a traditional cruise control device and the same vehicle controlled by one variation of this power management system described herein.

[0022] FIG. 2 illustrates steps that may be used to optimize power applied to a motor, as described herein.

[0023] FIG. 3A shows a schematic route as described herein. FIG. 3B shows steps that may be followed to determine a route destination.

[0024] FIG. 4 shows steps that may be followed to determine a calculated optimized velocity for segments of a route.

[0025] FIG. 5 shows steps that may be followed for determining a probable optimal speed based on historical route information.

[0026] FIG. 6 shows a schematic diagram of one variation of the power management logic described herein.

[0027] FIG. 7 illustrates one variation of a vehicle including a power management system, as described herein.

[0028] FIG. 8 illustrates a user interface for a power management device.

[0029] FIG. 9 shows inputs that may be coordinated by the power management user interface.

[0030] FIG. 10 shows a schematic diagram of a portion of a power management system, as described herein.

[0031] FIG. 11 illustrates a power management system remotely communicating with a server, as described herein.

[0032] FIGS. 12A and 12B show exemplary charge and discharge characteristics for one type of battery.

[0033] FIGS. 13A and 13B show examples of engine characteristics.

DETAILED DESCRIPTION OF THE INVENTION

[0034] The power supplied and used by a motorized vehicle can be optimized based on information inputs including: user demands, environmental conditions, the current or anticipated

operational state of the vehicle, and the operational parameters for the vehicle. These parameters can be estimated, directly measured, or derived, and may be used to determine the driving route, and therefore an estimated power requirement for the route. The estimated power requirement for a route and a historical power requirement from the same vehicle traveling over the same route may be used to determine the optimal power supplied to the vehicle. The power required of a vehicle and the optimal power supplied to a vehicle may also be expressed in terms of the speed or velocity of the vehicle.

[0035] Management of a vehicle's power supply typically involves optimization of the power supplied to the engine. As described herein, the "engine" may refer to any portion of the vehicle to which power is supplied, including the motor, powertrain, etc. As will be apparent below, optimizing the power supplied to the engine typically means minimizing the energy loss from the vehicle, thereby increasing fuel efficiency. The power supplied to the engine may alternatively be optimized based on other criterion. For example, the power supplied to the engine may be optimized with respect to speed or travel time. Furthermore, the devices, methods and systems described herein may be used with any appropriate vehicle, and are not limited to internal combustion vehicles. For example, the devices, methods and systems described herein may be used with vehicles having a hybrid internal combustion/electric engine, an electric engine powered by the electric grid (e.g., a plug-in vehicle), an electric engine powered by the sun (e.g., a solar vehicle), and an electric engine powered by hydrogen fuel cell. Thus the term "fuel" does not necessarily refer exclusively to hydrocarbon fuels, but may refer to any appropriate power source for the engine.

[0036] FIGS. 1A and 1B compare a traditional "cruise control" device (in FIG. 1A) to one variation of the power management device described herein (in FIG. 1B). In FIG. 1A, a typical cruise control device regulates the speed of a vehicle as it drives from point A to point B when the vehicle speed is set to 50 mph. As the vehicle moves across different terrain (e.g., roads having different elevations), or through different weather conditions, the traditional cruise control device adjusts the power supplied to the vehicles (and thus the speed) based only on the set velocity and the actual velocity of the vehicle. Thus, the cruise control device receives information on the current speed of the vehicle, and adjusts the power supplied to the engine to maintain the vehicle at the set

speed. This type of device is a “velocity control” cruise control device. In contrast, FIG. 1B shows a vehicle with a power management device for optimizing the power supplied to the vehicle, as described further herein.

[0037] In FIG. 1B, the power management system receives external inputs, including information on the location and grade (e.g., steepness of any uphill/downhill portions) of the road, the distances traveled. The power management system also includes or deduces information about the route (e.g., from point A to point B), and the acceptable range of speeds that the vehicle may travel over this route (e.g., between 45 and 55 mph). The power management system may also receive information about the state of the vehicle, including the velocity at which it is traveling, and the weight of the vehicle. Finally, the power management system may include operational parameters such as the performance of the engine, aerodynamic performance, and rolling resistance of the vehicle. Given this information, the power management system may calculate applied power to the engine, and may derive a speed (or set of speeds) that optimizes the applied power. As shown in FIGS. 1A and 1B, the total energy used by the power management system in FIG. 1B is 0.9 kwh compared to 1 kwh for the cruise control system shown in FIG. 1A for identical vehicles traveling over the same pathway.

[0038] In general, there are many ways to optimize energy efficiency, as described in more detail below. As will be described, any of the methods, devices and system described herein may be used together, individually, or in different combinations.

Inputs

[0039] The power management devices and systems described herein manage the power of the vehicle using inputs from four categories of information input: information from the external environment of the vehicle, information about the operational status of the vehicle, information from one or more command inputs, and operational parameters of the vehicle. Typically, at least one input from each of these sources of information is used to determine an optimal speed (or applied power) for the vehicle. Some of the information inputs for each of these categories are described below. In every case, the information may be directly measured (e.g., by sensors or other

inputs), communicated from an external source, or it may be derived from other information inputs, or from stored data.

[0040] Information from the external environment of the vehicle may be used to determine the optimal power to apply to the vehicle. External environment information generally includes any information about the environment surrounding or acting on the vehicle. External information may be used to determine forces acting on the vehicle (e.g., drag, wind resistance, tire resistance, etc.), the location of the vehicle relative to the destination (e.g., position, direction, etc.), and the environment surrounding the vehicle (e.g., traffic patterns, surrounding traffic, etc.). In some variations, the external information may be used to help describe the power available to the vehicle, particularly in solar powered vehicles (e.g., amount of light energy, time of day, position of the sun, etc.).

[0041] Examples of environmental information inputs include, but are not limited to: the current location of the vehicle, geographical information about the surrounding area, the elevation of the vehicle, upcoming elevations of the vehicle, the current slope/grade of road, the predicted slope/grade of the next segments of road, traffic surrounding the vehicle, the location of stoplights, the timing of stoplights, a map of the roadway, the present angle of the sun, the predicted angle of the sun for upcoming route segments, the weather around the vehicle, present wind direction, the predicted wind direction for upcoming route segments, present wind velocity, the predicted wind velocity for upcoming route segments, current temperature, the predicted temperature for upcoming route segments, current air pressure, predicted air pressure for upcoming route segments, time of day, date, day of week, visibility, present road conditions, predicted road conditions for upcoming route segments, and the distance from other vehicles.

[0042] Some of the information inputs may be redundant, or may be derived from related information. For example, the vehicle location may be provided by a GPS device which may be either a separate device or a portion of the power management device that receives a GPS signal and locates the vehicle based on the received signal. Geographical and topographical information about the area surrounding the vehicle may be determined from the location information. For example, the location may be used to index an atlas of the surrounding area.

Some variations of the power management device include a memory or database of information, including information about maps and road information. In some variations, the power management device communicates with one or more such databases to identify the location and surrounding road features (e.g., suggested speed limits, stop signs, traffic patterns, etc.).

[0043] The power management device may include or may be connected to sensors or other inputs to directly determine some of the information inputs. For example, the power management device may include a pre-set clock (e.g., for the current time and date), one or more optical sensors (e.g., to determine the intensity of sunlight, visibility, distance from nearby vehicles, etc.), and/or weather sensors (e.g., temperature, wind direction and velocity, air pressure, etc.). In some variations, the power management system receives some of this information by telemetry with off-board information sources such as databases and the like. For example, the power management system may communicate with a weather service, a map service, a traffic service, etc.

[0044] These examples of information about the external environment are only intended to illustrate the kinds of external information that may be used by the power management devices and systems described herein and are not intended to be limiting. Any appropriate information about the external environment may be provided to the power management device or used by the power management device.

[0045] Information about the operational status of the vehicle may be used to determine the optimal power to apply to the vehicle. Operational status information generally includes any information about the current operational status of the vehicle itself. Operational status information may be used to determine the current condition of the vehicle's engine and component parts (e.g., motor, powertrain, battery, tires, etc.), the current fuel supply, the manner in which the vehicle is traveling (e.g., velocity, acceleration, etc.), and the like.

[0046] Examples of environmental information inputs include, but are not limited to: the vehicle's current speed, the motor speed, the vehicle's current orientation, the RPM of the vehicle's motor, wheel rotations per minute, the battery state, the voltage of the battery, the amp hours from the battery, the state of the battery, temperature of battery, the age of the battery, and the number of times the battery has charged and discharged, the tire pressure, the drag force due to rolling

resistance of the vehicle, the weight of vehicle, the amount of air going to the engine, the amount of gas going to engine, and the weight of driver.

[0047] As described above, some of the information inputs may be redundant, or may be derived from related information. Furthermore, the power management system may use any of the sensors, gauges and detectors already present in the vehicle as information inputs. For example, the velocity of the vehicle may be detected by a speedometer which may pass information on to the power management system. The power management device may also include additional sensors, inputs or detectors to determine or derive any information about the operational status of the vehicle. For example, the power management device or system may include one or more weight sensors (to determine the load in the vehicle, including the driver's weight).

[0048] The examples of operational status information inputs are only intended to illustrate the kinds of operational status information that may be used by the power management devices and systems described herein. Any appropriate information about the operational state of the vehicle may be provided to the power management device or used by the power management device.

[0049] Information from one or more command inputs may be used to determine the optimal power to apply to the vehicle. Command inputs generally include any instructions from the driver of the vehicle about the operation (or intended operation) of the vehicle. Command inputs may be directly input by the user, or they may be derived by the actions of the driver or the identity of the driver.

[0050] Examples of command inputs include, but are not limited to: the acceleration applied by a driver, the braking applied by a driver, the vehicle's known or predicted final destination, the vehicle's known or predicted interim destination, preferred speed, maximum and minimum range over which speed should be adjusted, and preferred route.

[0051] As with all of the information inputs, some of the command inputs may be redundant, or may be derived from related information. For example, a route destination may be input by the driver, or it may be inferred from the driving behavior and/or identity of the driver. The identity of the driver may also be input by the driver, or it may be inferred. For example, the

identity of the driver may be matched to the weight of the driver. Command inputs may include any of the drivers actions to control the vehicle. For example, command inputs may include steering, breaking, shifting, or application of the accelerator. The power management device may include sensors, inputs or detectors to monitor the manipulations of the driver. In some variations, the driver may directly input commands to the power management system or to other devices in the vehicle that communicate these command to the power management system. For example, the driver may use an on-board navigational system to select a destination, and this destination may be communicated to the power management system. In some variations, the user may provide commands directly to the power management system. In some variations, the command inputs may be derived from other information, including the environmental information and the operational status information. For example, the destination (either a final or an intermediate destination) may be estimated based on the current location of the vehicle, the direction that the vehicle is traveling, the time of day and/or the driver of the vehicle (e.g., if it's 8:00 am, and driver X is driving the car on interstate 280, then the final destination is most likely to the address of X's work place).

[0052] Information inputs, including command inputs, may have default or pre-set values. For example, the power management device or system may have a preset or default maximum and minimum range of speeds for traveling part of the route (e.g., if the maximum and minimum range has not been explicitly input, the maximum and minimum range may be set to +/- 4 mph). In some variations, the information inputs may include metadata describing one or more features of an information input. Metadata may include information about the information input. For example, metadata may indicate the last time a particular data input was updated, or may indicate that the data is a default setting, or the like.

[0053] These examples of command inputs are only intended to illustrate the kinds of command inputs that may be used by the power management devices and systems described herein. Any appropriate command input may be provided to the power management device or used by the power management device.

[0054] Information from one or more operational parameters of the vehicle may be used to determine the optimal power to apply to the vehicle. Operational parameters generally include

information about characteristics that are specific to the vehicle (e.g., characteristics of component parts of the vehicle, including the battery, the engine, the powertrain, the tires, etc.). Operational parameters of the vehicle may be stored and retrieved from a memory that is part of the power management device or system, or they may be retrieved from a remote information source.

[0055] Examples of operational parameters include, but are not limited to: aerodynamic parameters (CDA), rolling resistance parameters (Crr1 and Crr2), drive train efficiency parameters, motor efficiency parameters, and battery model parameters, battery charge and discharge relationships, type of battery.

[0056] The operational parameters may be fixed (e.g., may not vary with operation of the vehicle), or they may be changed. In some variations, the operational parameters may comprise a database (e.g., a lookup table), so that the value of the operational parameter may depend upon another information input, and may be retrieved from the database by using one or more information inputs as a search key. In some variations, the operational parameter may comprise an equation or relationship that has other information inputs as variables.

[0057] Examples of operational parameters are provided below. In general, operational parameters may be determined experimentally (e.g., by testing) or may be provided by product manufacturers. In some variations, general (or generic) operation parameters may be used if more specific parameters are not available. For example, battery charge and discharge graphs (showing operational characteristics of the battery) can be obtained from battery manufacturers. Operational parameters for various types of batteries (e.g., Lithium polymer batteries, etc.) can include material characteristics, energy densities, power densities, thermal characteristics, cycle life, charge and discharge characteristics (e.g., voltage over time), and current flux over time. For example, FIGS. 12A and 12B show exemplary charge and discharge characteristics for one type of Lithium polymer battery (e.g., the Li-Po 40Ah from Leclanche SA, Switzerland). Complete characterization may also be made by taking charge and discharge measurements from either a specific battery, or a specific model and make of a battery.

[0058] Motor efficiency data may be obtainable from the manufacturer. A full model dynamometer testing may also be used to determine motor characteristics. For example, FIGS. 13A

and 13B show some examples of motor characteristics that may be provided. Aerodynamic parameters of the vehicle (e.g., the outer chassis) can also be provided by the auto manufacturer, or could be measured (e.g., in a wind tunnel). Aerodynamic properties may also be estimated or calculated for different vehicles (or vehicle shapes, makes, or models) using literature values. Examples of aerodynamic parameters may be found, for example in “GM Sunraycer Case History/M-101” (Published by the Society for Automotive Engineers, Inc, December 1, 1990), The Leading Edge: Aerodynamic Design of Ultra-Streamlined Land Vehicles (Engineering and Performance) by Goro Tamai (Robert Bentley, Inc, 1999), and The Winning Solar Car: A Design Guide for Solar Race Car Teams by Douglas R. Carroll (SAE International, 2003), each of which is herein incorporated by reference in its entirety. Examples of drag coefficients are also readily available (e.g., online: <http://www.answers.com/topic/drag-coefficient-1>, last visited October 12, 2005).

[0059] Rolling resistance parameters may also be provided by the tire manufacturer, or may be measured. An example of one variation of a published rolling resistance formula may be found in “Fahrwerktechnik: Reifen und Raeder” by Jörnßen Reimpell and Peter Sponagel (published by Vogel-Fachbuch Technik, ISBN 3-8023-0737-2, 1988), herein incorporated by reference in its entirety. Similarly, a drivetrain efficiency model may be provided by the vehicle manufacturer, or may be measured from the power input vs. the power output for the entire drivetrain. In some variations, (e.g., some variations of solar cars, for example) do not have a drivetrain, since the motor is built directly into the wheel.

[0060] Examples of operational parameters are only intended to illustrate the kinds of operational parameters of the vehicle that may be used by the power management devices and systems described herein. Any appropriate operational parameter may be provided to the power management device or used by the power management device.

[0061] The information inputs described herein may be used to determine the optimally efficient energy to supply to the engine.

Optimization of Engine Efficiency

[0062] FIG. 2 illustrates some of the steps that may be followed to optimize the energy supplied to an engine so that the vehicle travels at a fuel-efficient speed. To determine an optimally efficient speed (or the optimal power to be supplied to the engine), a route is determined 201 from the starting position and an actual or estimated ending position, the route is segmented 203 into one or more segments, a model optimal speed (or power) is calculated 205, statistical data from previous trips along the same segment of the route are retrieved 207, and an overall efficiency applied power is calculated from at least the model power and the statistical data 209. Finally, the overall efficient applied power is provided to the engine. In some variations, the vehicle operator may be notified of the overall efficient applied power instead of (or in addition to) automatically applying this optimal power. Each of these steps is described more fully below. The statistical data from previous trips may be an optional element. For instance, one may choose not to use statistical data or one may not have statistical data.

1. Determine route

[0063] The route is determined based on the current position of the vehicle and a final destination position. The destination position may be explicitly provided by the operator of the vehicle (e.g., as an operator input), or it may be derived. In some variations, the operator may provide a destination directly to the power management device, or to a device that communicates with the power management system (e.g., an on-board navigation system, etc.). The operator may also select the preferred route to the final destination either before beginning the trip, or after beginning the trip. For example, the operator may choose a destination using a navigation system including navigation systems that are not part of the power management device (such as any commercially available GPS navigation systems), which may also generate a route. The GPS navigation system may communicate the destination and route information to the power management device. In some variations, the power management system includes a GPS component or module, and may at least partly act as a navigation system.

[0064] The destination may be derived from information about the operator, the current location, the time of day, or the like. The power management device may include statistical

destination logic that determines one (or more) most likely destinations based on information provided from environmental inputs, user command inputs, and vehicle operational status inputs. In some variations, the destination is derived by generating a series of statistically weighted (e.g., likely) destinations based on any, all, or some of these inputs. Examples of some of the inputs that may be used by the statistical destination logic to determine a likely destination may include, but are not limited to: the weight of the driver, the time of the day, the current location of the vehicle, the direction that the vehicle is facing (or traveling in), the day of the week, and the speed of the vehicle.

[0065] The statistical destination logic may identify one or more destinations based on information held in a memory. For example, the statistical destination logic may use any of the information inputs to select among a record of destinations to which the vehicle has previously driven. These destinations may be assigned a probability weighting based on the information inputs. For example, the statistical destination logic may continuously infer the vehicle's destination. The information inputs can be used to assign a probability to a particular destination. It is important to note that the word "destination" in this context is not necessarily the driver's final destination. It may be an intermediate destination along the route that the statistical destination logic determines has a greater chance than some threshold likelihood (e.g., X%) of being the destination. A threshold likelihood may be preset, and may be varied by the user or by the power management device.

[0066] For instance, if a driver leaves her house to go to work, and drives toward the highway, the statistical destination logic may determine that there is a 95% chance that she is going to the highway but only a 75% chance that she is going to go South on the highway. So, if the threshold (X) is 90%, the "destination" in this case would be the highway onramp. Once she gets on the highway going south, the probability that she is going to work may have increased to 92%. Now, the "destination" would be her work. Thus, as the vehicle drives around, the probable destination determined by the statistical destination logic may constantly change to revise the destination or intermediate destination.

[0067] In some variations, the statistical destination logic accesses (and may also write to) a memory comprising past destinations that are correlated to some or all of the information inputs (such as location, driver weight, time of day, day of week, direction, velocity, etc.), and/or information derived from these inputs (e.g., driver identity, driving habits, etc.). The list of possible locations may be weighted by the statistical destination logic based on how closely the information inputs correspond to the associated information inputs for these destinations, and may be influenced or refined by the number of times that the driver has driven to this destination. Some of the information inputs (or some combination of the information inputs) may be weighted more heavily than others in determining the likelihood of a destination. Furthermore, the statistical destination logic may select more than one likely destination, including selecting a final destination and one or more intermediate destinations.

[0068] One variation of a procedure for determining the most likely destination is described below, and illustrated in FIG. 3B. For example, the schematic route shown in FIG. 3A has 10 junctions (A to J). The probability that a driver will take any particular route from the start position may be described as “P”. Thus, P_{old} is the previous (or old) percentage likelihood of taking a route, whereas P is the newly calculated percentage likelihood. P_{old} is initially set to 1 because there is a 100% likelihood that your route will go through the place that you are currently at. As used in this example, an intersection is as a junction having more than one choice of direction that you may go in. Examples include highway exits (e.g., you can stay on the highway or take the exit), a four-way stop, and a fork in the road.

[0069] Referring now to Fig. 3A, assume that you have taken the following trips:

1. start $\rightarrow$ A $\rightarrow$ C $\rightarrow$ E
2. start $\rightarrow$ A $\rightarrow$ C $\rightarrow$ D $\rightarrow$ F
3. start $\rightarrow$ A $\rightarrow$ G $\rightarrow$ I
4. start $\rightarrow$ A $\rightarrow$ G $\rightarrow$ I
5. start $\rightarrow$ A $\rightarrow$ C
6. start $\rightarrow$ A $\rightarrow$ C $\rightarrow$ E
7. start $\rightarrow$ A $\rightarrow$ C $\rightarrow$ E
8. start $\rightarrow$ A $\rightarrow$ G $\rightarrow$ J $\rightarrow$ C $\rightarrow$ E
9. start $\rightarrow$ A $\rightarrow$ C $\rightarrow$ E
10. start $\rightarrow$ A $\rightarrow$ C $\rightarrow$ D $\rightarrow$ F

[0070] Based on this trip history, the probably of your taking moving from any junction in the route shown in Fig. 3A can be determined based on this trip history. These probabilities are tabulated in the table:

Position	Probably of continuing in the possible directions	Probably of going through each location based on past behavior
start	10/10 A	
A	7/10 C 3/10 G 0/10 B	A: 10/10 = 100%
B	0/0	B: 0/0 = 0%
C	2/8 D 5/8 E 1/8 end	C: $(10/10) \cdot (7/10) + (10/10) \cdot (3/10) \cdot (1/3) \cdot (1/1) = 71\%$
D	2/2 F	D: $(.71) \cdot (2/8) = 17.75\%$
E	5/5 end	E: $(.71) \cdot (5/8) = 44.375\%$
F	2/2 end	F: $(.1775) \cdot (2/2) = 17.75\%$
G	2/3 I 1/3 J	G: $(10/10) \cdot (3/10) = 30\%$
H	0/0	H: 0/0 = 0%
I	2/2 end	I: $(.30) \cdot (2/3) = 20\%$
J	1/1 C	J: $(.30) \cdot (1/3) = 10\%$

[0071] The table also shows the probably of going through each location based on my previous driving behavior in the next trip. For a new trip, at each junction, the probabilities may be recalculated. For example (on the same trip), once you have reached point A and decided to turn toward C, the new probabilities are recalculated as: A: 0%, B: 0%, C: 100%, D: 25%, E: 62.5%, F: 25%, G: 0%, H: 0%, I: 0%, J: 0%. In real world examples, it could take hundreds of drives before the statistics become useful at predicting where the driver is likely to go. FIG. 3B illustrates one variation of a statistical destination logic that may be used.

2. Segment route

[0072] The route used by the power management device typically includes a starting position (e.g., the current position of the vehicle, which may be indicated by GPS), an ending position, as described above, and any intermediate positions between the initial and the final positions. In some variations, the route may be broken up into segments that may be used by a

power management device to optimize the power needed to travel this segment. A segment may comprise any distance to be traveled, including the entire route, or small portions of the route. Different segments in the same route may be of different lengths.

[0073] The route may be segmented in any appropriate manner. For example, the route may be broken into segments based on predetermined or anticipated changes in speed (e.g., switching from 65 to 55 mph), changing traffic patterns (e.g., turns, stops, yields, etc.), traffic or anticipated traffic, distance (e.g., x miles), terrain (e.g., the gradient or condition of a road), or the like. In some variations, the route may be segmented based on a combination of such factors.

[0074] A route may be entirely segmented, or only partially segmented. For example, the power management device may segment only the first part of the route (e.g., the portion containing the current position of the vehicle), or the first few segments. This may be particularly useful when the destination is an anticipated destination determined by the statistical destination logic, for example. The route may be continuously re-segmented. For example, as the vehicle moves, the power management device may become aware of changing road conditions (e.g., traffic, weather, etc.), or the user may change the route, necessitating re-segmenting. As used herein, “continuously” may mean repeated multiple times, including repeating regularly or periodically.

[0075] In some variations, the entire route (or the entire predicted route) may be divided up into N segments. The number (N) of segments may be fixed or may depend upon the route. The more segments that the route is split into, the more accurate the model may be. However, more segments may also require more computing power. Thus, the number of segments N may be decided based on the tradeoff between computing power and accuracy.

3. Calculated energy for the route

[0076] The power required by the vehicle to travel along a route, or a segment of the route, may be estimated or calculated, and this calculation may be used to determine a calculated speed for the vehicle so that the power usage is optimized or minimized. Such calculations of power requirements at different speeds typically use information inputs from the vehicle, the user, and the

environment over the route from the initial position to a destination (e.g., a final destination or an intermediate destination). Any appropriate information input may be used.

[0077] Simulation of the power requirement of the vehicle may estimate power requirements at different speeds. Thus, the speed(s) that the vehicle travels the route (or a segment of the route) can be optimized. For example, the simulation could determine the most energy efficient speed for the vehicle to travel over one or more segments by minimizing the power requirement for the vehicle while allowing the speed to vary within the range of acceptable speeds.

[0078] In some variations, the power management device includes simulated energy requirement logic that determines the power requirement given the information inputs (e.g., information from the external environment of the vehicle, the operational status of the vehicle, information from one or more command inputs, and operational parameters of the vehicle). The simulated energy requirement logic can calculate the required applied power for the vehicle by calculating different power requirements for all or a portion of the route (e.g., the first segment) when the speed of the vehicle is within the range of speeds acceptable for traveling this section of the route. For example, if the target speed for a portion of the route is 60 mph with a range of +/- 5 mph, the simulated energy requirement logic may determine the speed at which the energy requirement is lowest that is closest to the desired speed (60 mph). Any appropriate method of calculating and/or optimizing this velocity may be used, including iteratively simulating different speeds within the target range.

[0079] The optimal speed may be calculated by energy calculation logic. A simplified example is provided below, using the following parameters, assuming an electric car with regenerative brakes.

mass of the vehicle and the driver (m)	4000 kg
CdA of the car	.25
The rolling resistance coefficients:	
Crr1	.01
Crr2	.05
Drivetrain efficiency (eff)	80%

air density (ρ)	1.3 kg/m ³
acceleration due to gravity (g)	9.8 m/s ²
number of wheels (n)	4
headwind velocity (v_{hw})	10 kph or 2.78 m/s

[0080] In this example, the route may be split into five segments of 5 km each with the following altitudes measured at the end of each segment: 0 (beginning of segment 1), 200 m (end of 1), 100 m (end of 2), 400 m (end of 3), 100 m (end of 4), 0 (end of 5). We may also make the simplifying assumption that the road grade is constant between measured points, and the road grades are calculated to be: +0.04 (seg 1), -0.02 (seg 2), +0.06 (seg 3), -0.06 (seg 4), -0.02 (seg 5). The target average speed is 100 kph.

[0081] For the sake of simplicity in this example, we can then calculate the amount of energy required to drive at a constant 100 kph speed for the entire route, as well as for 16 other combinations of the speeds 95 kph (26.39 mps), 100 kph (27.78 mps), and 105 kph (29.17 mps). In practice, this simulation may be run for hundreds or even thousands of combinations of speeds which may be tested to find the optimal speed to drive each segment. It is assumed that we enter the first segment traveling 100 kph (27.78 mps). It is also assumed that the speed listed for the segment is the final speed of the segment and the vehicle accelerates linearly throughout the segment.

[0082] The table below shows the results of the energy calculation for all of the combinations tried. The lowest energy usage is 4275.94 Watt-hours. This was obtained by going 95 kph (seg1), 105 kph (seg2), 95 kph (seg3), 105 kph (seg4), 100 kph (seg5). The average speed over all 5 segments is still 100 kph, but the energy used is 10.2% less.

iterations	seg 1	seg 2	seg 3	seg 4	seg 5	Energy	units
1	27.78	27.78	27.78	27.78	27.78	4763.2484	Whr
2	26.39	29.17	27.78	27.78	27.78	4536.889	Whr
3	26.39	29.17	26.39	29.17	27.78	4275.938	Whr
4	26.39	29.17	26.39	27.78	29.17	4382.5026	Whr
5	26.39	29.17	27.78	26.39	29.17	4950.1438	Whr
6	26.39	29.17	27.78	29.17	26.39	4438.3467	Whr
7	26.39	26.39	29.17	29.17	27.78	4942.6325	Whr
8	26.39	26.39	29.17	27.78	29.17	5055.9124	Whr

9	26.39	26.39	27.78	29.17	29.17	4784.1865	Whr
10	29.17	26.39	27.78	27.78	27.78	5013.2565	Whr
11	29.17	26.39	26.39	29.17	27.78	4745.585	Whr
12	29.17	26.39	26.39	27.78	29.17	4852.1495	Whr
13	29.17	26.39	27.78	26.39	29.17	5137.6625	Whr
14	29.17	26.39	27.78	29.17	26.39	4914.7142	Whr
15	29.17	29.17	26.39	26.39	27.78	4602.8845	Whr
16	29.17	29.17	26.39	27.78	26.39	4493.3028	Whr
17	29.17	29.17	27.78	26.39	26.39	4765.4617	Whr

[0083] In general, any appropriate relationship between the information inputs, the speed (e.g., the applied power) and the required energy may be used to determine an optimized speed. In some variations, the energy requirement may be calculated from aerodynamic information, rolling resistance, potential energy change due to road gradient and acceleration. FIG. 4 shows one method of determining the target speeds for a route by an iterative method. One variation of a method for determining target speeds is described by the equation:

$$E = \frac{V_{tarn}}{eff} \left(CdA \frac{\rho}{2} (V_{tarn} + V_{hw})^2 + (mgC_{rr1} + nV_{tarn} C_{rr2}) \cos(\tan^{-1}(G)) + mg \sin(\tan^{-1}(G)) + ma \right)$$

where E is the total energy used over the segment. The terms of the equation include:

$$\frac{V_{tarn}}{eff}$$

where V_{tarn} = target velocity over time, and eff is the efficiency of the powertrain.

[0084] The terms inside of the parenthesis calculates the total drag force on the vehicle. However, we want to calculate the total amount of energy. In general, Power = Force * Velocity, and Energy = Power * time = Force * Velocity * Time. The total amount of energy used is increased based on the power lost due to the inefficient powertrain.

[0085] The drag force due to the aerodynamics of the car is expressed as:

$$CdA \frac{\rho}{2} (V_{tarn} + V_{hw})^2$$

where C_dA is the coefficient of drag time area (which can be a measured value), and ρ is the density of air, V_{tarn} is the target velocity in the n th iteration, and V_{hw} is the headwind velocity.

[0086] The drag force due to the rolling resistance of the tires is expressed as:

$$(mgC_{rr1} + nV_{tarn}C_{rr2})\cos(\tan^{-1}(G))$$

where m is the mass of the car, g is the acceleration due to gravity, n is the number of wheels, V_{tarn} is the target velocity in the n th iteration, C_{rr1} and C_{rr2} are the coefficients of rolling resistance, and G is the grade of the road. The coefficients of rolling resistance may be measured values or they may be values supplied by tire manufacturer (e.g., tire manufacturer). The numbers may vary for different road surfaces as well.

[0087] The force due to the road gradient is:

$$mg\sin(\tan^{-1}(G))$$

where m is the mass of the car, g is the gravitational constant, and G is the grade of the road. The force due to the acceleration of the car is ma (the mass of the car times the acceleration over the segment, assuming linear acceleration for the segment).

[0088] Putting everything together, the equation can be solved for E , the total energy used over the segment. Similar equation are described for calculating the total energy used over a segment in “The Speed of Light, The 1996 World Solar Challenge” by Roche, Schinckel, Storey, Humphris, and Guelden (UNSW, 1997), herein incorporated by reference in its entirety.

[0089] FIG. 4 describes a method of calculating an array of optimized velocities for an entire route that has been broken up into segments. In some variations, only one or a subset of optimized speeds are calculated.

[0090] Variations on the above equations may be made to simplify the relationships or to include additional factors. For example, the speed varying part of the rolling resistance equation may be removed to simplify the equation to: $mgC_{rr}\cos(\tan^{-1}(G))$. Additional factors could be added

as well, for example, by including the variation of the motortrain efficiency with speed, or by including the variations of the CdA depending on the directionality of the wind.

4. Historical route information

[0091] The power management device may refer to a record of historical route information. For example, the power management device may include a memory or a data structure that holds information on routes or segments or routes that the vehicle has previously traveled. The memory may comprise a database, a register, or the like. In some variations, a power management system communicates with a memory or other data structure that is located remotely. The record of historical route information may include the route information (e.g., starting location and any intermediate locations), as well as information about the actual or optimized velocities and/or applied power for the vehicle traveling the route. The record of historical route information may also include any informational from information inputs (described below). For example, the record of historical route information may include information about the time of day, weather conditions, road conditions, driver, etc. Multiple records for the same route (or segments of a route) may be included as part of the record of historical route information.

[0092] The record of historical route information may provide statistical information on driving habits. The driving habits of an operator over a particular route or segment of a route may be determined by analyzing the previous times that the driver has taken this route, and by looking at the efficiency (e.g., the power efficiency) for each previous trip, and for the combination of previous trips. Thus, the historical route information may be analyzed by statistical route analysis logic that can determine a probable optimal speed at each point along a route (e.g., at segments along the route). The more times that a driver has driven the route, the more data can be used to estimate a probable optimal speed for all or part of the route.

[0093] Historical data may be particularly useful when there is a large amount of such data available. Instead of trying to calculate the predicted power usage based on physics modeling, this method merely looks at all of the previous data to determine the power that would be utilized to drive each segment at a particular speed. For example, in the past, a driver may have driven a particular segment 1000 times. Out of those thousand times, she may have driven it at speeds

ranging from 80 kph to 120 kph. For each of those 1000 times that she drove the segment, the car recorded how fast she drove it, and how much energy was used. Therefore, to estimate how much energy would be required to drive the segment at 95 kph, the power may be estimated by taking an average of all of the previous times the driver drove that segment at 95 kph to arrive at an estimated energy usage, rather than calculating the power from the physics calculations, as described above. In one variation, only the previous trips along the segment made under approximately similar conditions are considered (e.g., similar cargo weight, headwinds, etc.).

[0094] FIG. 5 describes one method of using historical data to determine a Probable Optimal Speed. This speed most likely approximates the optimal speed, based on previous trips. In general, this method is most accurate when there are many similar previous trips to be in the database. FIG. 5 shows that, the location of the vehicle is periodically determined (e.g., via GPS, manual entry, etc.), and this location can then be used to determine a historical segment corresponding to the current location. As described above, every route may be divided into a finite number of segments, and the more segments that the route is split into, the more accurate the algorithms may be. However, additional segments also increase the computing power needed. The destination is also determined periodically 505 (e.g. as the vehicle is moving), and is reevaluated based on the current location. It can then be determined if the vehicle is in the same segment as previously determined or if it has entered a new segment 507 since reevaluating the vehicle location. If the answer is “yes,” then nothing needs to be done until the next time the location is measured. If the answer is “no,” then the database is examined to find the historical information about this segment. For example, the historical information is queried to determine what speed the vehicle was traveling every time that the vehicle (or the specific driver of the vehicle) was in the same segment going to the predicted destination. In particular, the historical information is queried to determine how fast the vehicle was traveling during the trip in which the vehicle used the least amount of energy over the same route. The result of this query gives a speed that is most likely the best (e.g., most efficient) speed to travel for the current trip. The process can iteratively repeat for the next location measurement as the vehicle continues.

[0095] FIG. 5 describes a method of determining a probable optimal speed using historical route information. In FIG. 5, the probable optimal speed is identified from the historical route

information as the most efficient speed (e.g., the speed having the lowest energy requirement) used by the vehicle when traversing the segment, when that segment is part of a route having the same destination as the current destination. The flowchart shown in FIG. 5 illustrates a continuous process, in which the power management device can determine a probable optimal speed as the current segment changes (e.g., as the vehicle moves).

[0096] In some variations, probable optimal speeds may be identified for the entire route. For example, the predicted or actual route may be segmented, and an array of probable optimal speeds may be identified from the historical route information for each segment. In some variations, the probable optimal speed is not a single most efficient speed for a segment of a route, but is derived from a combination (e.g., an average, median, weighted average, etc.) of all or a subset of the historical route information speeds. In some variation, only a subset of the historical route information is used. For example the probable optimal speed may be driver specific, so that only information for a specific driver is used to calculate a probable optimal speed. Drivers may be identified by bodyweight, or some other information input, including self-identification. If there is no historical route information for the segment or route being examined, then the probable optimal speed may be set to a predetermined value (e.g., zero), or some other indicator may be toggled so that the probable optimal speed is not relied upon.

[0097] In one variation, a reliability estimate may be assigned to the probable optimal speed. For example, a reliability estimate may be related to the number of data points (e.g., the number of times that the vehicle (or a driver driving the vehicle) has driven that segment or route. For example, if there are no records of the vehicle driving the route, the reliability estimate may be set very low. Generally, the more records for a route in the historical route information, or the more closely the identifying information in the record matches the information about the current route (e.g., the driver, weather conditions, traffic, etc.), the higher the setting of the reliability estimate.

5. Calculation of an efficient speed output

[0098] Finally, an efficient speed for the vehicle to travel the route (or a part of the route) may be determined from the calculated optimized speed and the probable optimal speed. The

optimum speed is the most efficient speed (E), as described above. This efficient speed (or efficient speed output of the power management system) may also be expressed as the applied power that is provided to the engine to achieve the speed at which the fuel efficiency is optimal. Thus, an efficient speed is typically a function of the driver's current operational demands, the current operational conditions of the vehicle, the operational parameters for the vehicle, and any historical behavior of the vehicle taking the same (or a similar) route.

[0099] In general, an efficient speed output is determined by a combination of the calculated optimized speed and the probable optimized speed after they have been appropriately weighted. In some variations, this weighting takes into account the total energy predicted by the calculated optimized speed (e.g., by the simulated energy requirement logic) and the total energy required for the route predicted by the probable optimized speed (e.g., by the statistical route analysis logic). The reliability estimate for the probable optimized speed may also contribute to the weighting. The power management device may include derived efficient speed logic that can determine efficient speeds for the vehicle to travel the route, or a portion of the route. In some variations, the efficient speeds are expressed as power or energy to be applied to the vehicle engine (e.g., the applied power).

[0100] As previously mentioned, the methods and logic described above may be used to calculate a speed or an applied power for running the vehicle at an optimal fuel efficiency. As will be apparent to one of skill in the art, the same procedures may be used to determine a speed (or speeds) over the route that minimize or maximize other factors, and are not limited to optimizing only fuel efficiency. For example, the power management device may control the speed of the vehicle so as to minimize the duration of the trip instead of (or in addition to) fuel efficiency. Thus, the simulated energy requirement logic may be expressed as a simulated time requirement, and may calculate the time required to travel a segment of the route as a function of the speed or energy, and additional information input. In this case, calculated optimized speeds may be determined by minimizing the duration of the trip over each segment. Furthermore, the probable optimal speed may be determined from the historical route information based on the duration of travel, rather than the power applied, for each segment.

Control Logic

[0101] The power management device may include control logic for controlling the operation of the power management device. Control logic may include logic for acquiring information inputs, communicating with different components of the power management system, estimating the destination of the vehicle from information inputs, segmenting the route into segments, simulating the energy requirements of the engine from information inputs, and controlling the entire power management device or system.

[0102] For example, the power management device or system may include polling logic for acquiring information inputs and may also coordinate writing of information from the power management device to a memory. In some variations, the polling logic polls sources of information data that are provided to the power management device. For example, the polling logic may poll data from sensors, inputs, memories, or any other source of information data. The polling logic may further coordinate storing of this data in a memory, such as a memory register or a memory device or database that may be accessed by the power management device or system. In some variations, the polling logic causes old data (e.g., greater than x weeks old) to be overwritten. The polling logic may also control how often the various information data sources are polled. For example, the polling logic may continuously poll data from external environmental sensors (e.g., detecting location, direction, elevation, traffic, weather, etc.) and operational status detectors (e.g., detecting vehicle speed, wheel velocity, motor speed, etc.). The polling logic may also coordinate writing of route information. For example, the polling logic may coordinate recording the decisions made at intersections, and information about routes traveled by the vehicle, and the like. In some variations, the polling logic also coordinates the writing of information derived from the information inputs to a memory. For example, the polling logic may coordinate recording the optimal speed or energy used to traverse a segment or other portion of a route.

[0103] As described above, the power management device or system may also include statistical destination logic. Statistical destination logic may infer one or more likely destinations based on the information inputs. For example, the power management system may infer the destination of the route based on the current location and direction of the vehicle, and the date and

time of day. In some variations, the power management system is unable to infer a final destination, but it can generate an intermediate destination or segment for the route, as described above. The probable destination(s) identified by the statistical destination logic may then be used to optimize the power needed to travel the route or a segment of the route, and to determine a historical probable optimal speed.

[0104] In some variations, the power management device or system includes simulated energy requirement logic and statistical route analysis logic. As described above, simulated energy requirement logic may determine a calculated optimized speed for the vehicle, and statistical route analysis logic may be used to determine a probable optimal speed. The power management device or system may also include derived efficient speed logic that determines the most efficient speed or power to be applied to the vehicle engine, as described above.

[0105] Power management logic can coordinate different components of the power management system, including the logic components, user interfaces, informational data inputs, memory, processors, motor control mechanisms, and the like. Thus, the power management system may include power management logic to control the overall activity of the power management system. FIG. 6 shows a graphical representation of one variation of the power management device, indicating that the power management logic controls and coordinates the various components of the system. In FIG. 6, the polling logic 607 coordinates the activity of information inputs 601, 603, 605. The information inputs are also linked to each other and to the statistical destination logic 609, statistical route analysis logic 611, and simulated energy requirement logic 613. In particular, these elements are all connected to the memory, and may read and write to this memory. The derived efficient speed logic also controls these three logic elements 609, 611, and 613. As described above, the derived efficient speed logic 615 may produce an efficient speed output for each part of the route (e.g., the speeds or applied powers resulting from optimizing the fuel efficiency over the route or parts of the route). Before this applied power can be used to control the motor (via a motor control mechanism 619), the power management logic may check for overrides such as operator overrides (e.g., breaking), or other overrides that may be indicated by the headway cruise control box 617. For example, the operator may override the power management device by applying the

brakes, etc. The power management device may also be preempted by an obstruction (such as another vehicle) in the “headway” that blocks the vehicle, requiring the vehicle to slow or stop.

[0106] FIG. 6 shows one variation of the power management device described herein. As will be apparent to those of skill in the art, different variations are possible. For example, additional components (e.g., communications elements, microprocessors, memories, etc.), and/or additional logic (e.g., route segmentation logic, operator interface logic, etc.) may also be included. In some variations, some of the elements may be omitted (e.g., the separate polling logic), or may be combined with other elements. In some variations, the organization of the elements may be different. For example, the statistical destination logic may be controlled by the polling logic, rather than the derived efficient speed logic.

Power Management Devices

[0107] In general, the power management device comprises power management logic that receives information input about the external environment of the vehicle, the operational status of the vehicle, one or more command inputs from the driver, and one or more operational parameters of the vehicle. The power management device may also include additional components such as information inputs (e.g., sensors, detectors, relays, etc.), one or more processors (e.g., microprocessors), memories (e.g., databases, ROM, RAM, EPROM, etc.), communications devices (e.g., wireless connections), user interfaces (e.g., screens, control panels, etc.), and/or motor control mechanisms. In some variations, the power management device may be installed into the vehicle by the vehicle manufacturer. In other variations, the power management device may be retrofitted into a vehicle. In general, the power management device or system intervenes between the driver and the engine. In practice, the power management system may be physically located in any appropriate location in the vehicle. FIG. 7 shows one example of a vehicle having a power management system 701 as described herein. In FIG. 7, the power management system is shown in the front of the car 700, connecting the motors 705 and batteries 707.

[0108] Any appropriate sensors, detectors or data inputs may be used with the power management devices and systems described herein. For example, sensors for detecting external environmental information may be used (e.g., optical, mechanical, electrical, or magnetic sensors).

Sensors may be monitored (e.g., polled) in real-time, as described above. For example, polling logic may coordinate continuous or periodic polling of Global Positioning System (GPS) information (e.g., giving information on the vehicle's current location, current elevation, upcoming elevations, upcoming terrain, vehicle's destination, etc.), speedometer information (e.g., vehicle's current speed, motor speed), date and time information (e.g., the date and time may be used to determine personal driving habits and sun angle), gyroscope information (e.g., vehicle's current orientation, current slope/grade of road), RPM (e.g., motor and wheel rotations per minute), accelerator and brake pedal position (e.g., pressure applied and/or current angle of the pedals), the angle of sun (e.g., sensors may detect latitude, longitude, time of day, date), weather (e.g., wind direction and velocity, rain, sun, snow, etc.), battery state (e.g., voltage, amp hour meter, etc.), tire pressure (e.g., may be used to calculate the drag force due to rolling resistance), headway control information (e.g., the distance from a car in front of the vehicle), the weight of car (e.g., weight of cargo, passengers, driver), airflow (e.g., the amount of air going to the engine), gas flow sensor (e.g., the amount of gas going to engine of a hybrid or ICE car), weight of driver (e.g., may be used to identify the driver and linked to personal driving habits). Different detectors or sensors may be polled at different intervals, including continuously, or only occasionally. Polling may also depend upon the availability of a resource. For example, information may be available only when a telecommunications network (e.g., satellite, cellular, etc.) is available.

[0109] In some variations, a memory may be used. The memory may be read/write memory, or read only memory. The memory may include information, such as information on the operational parameters of the vehicle related to the make and model of the vehicle. As described above, operational parameters may include look up tables, charts, or the like. For example, a memory may include information about an aerodynamic model (CDA) for the vehicle, a rolling resistance model (Crr1 and Crr2), a drive train efficiency model, a motor efficiency model, and/or a battery model (e.g., charge and discharge graphs for the battery). In some variations, these models are not part of a memory, but are algorithms or logic.

[0110] Any appropriate memory may be used, including ROM, RAM, removable memories (e.g., flash memory), erasable memories (e.g., EPROM), digital media (e.g., tape media, disk media, optical media), or the like. In some variations, the memory may comprise a database

for holding any of the route information (including historical route information), about the segments traveled, the speeds traveled, energy usage measured or calculated for this route or segment, who the driver was, external environmental conditions while driving the route, operational status of the vehicle while driving the route, and command inputs while driving the route. The power management system may include more than one memory.

[0111] The power management system may also include one or more user interfaces. A user interface may allow input of user command information (e.g., selecting a destination, selecting a route, selecting a target speed or speeds, selecting a range of acceptable speeds, etc.). In some variations, a user interface may also provide output from the power management system that can be viewed by the user. For example, the user interface may provide visual or auditory output, or suggest target speeds that the user can match to optimize power supplied to the vehicle. In some variations the user interface may provide status information to the user about the power management system. For example, the user interface may indicate that the power management system is engaged, what the destination (or predicted destination) is, what the optimal speed (or speeds) is, what inputs are missing or estimated, or the like. In some variations, the user interface may display any of the information inputs.

[0112] FIG. 8 shows one variation of a user interface for a power management device or system. In FIG. 8, the user interface 800 includes a screen region 801, that shows a two-dimensional map indicating at least part of the route 805 and the direction of travel 803, the temperature of the external environment 807, the weather 809 (indicated by an icon), the current or derived efficient speed 811, the set (or cruising) speed 813, and the range within which the speed should be maintained 815. The screen region of the user interface shown in FIG. 8 also shows the destination 819.

[0113] In some variations, the user interface of the power management system may include multiple screens for displaying information, or for accepting user input. In FIG. 8, the user interface also includes a plurality of buttons 821, including a toggle 823 allowing menu-driven interaction. The user interface may also include messaging features. For example, when the vehicle is turned on but stopped, a user interface may indicate a message has been sent/received (e.g., by

flashing, etc.). When the user presses a “Messages” button, the system may display feedback messages. For example, if the tire pressure sensor notices that the tire pressure is low, a message to that effect will be displayed to the user. Diagnostic/test messages can also be sent to this screen for testing, development, or repair purposes. The messaging features may be included on the face of the user interface (e.g., as a “Messages” button 821, etc.).

[0114] FIG. 9 illustrates the flow of information in one variation of a power management system. Information inputs into the power management system 901, 903, 905 enter the system and some (or all of them) may be displayed by the user interface. For example, external information inputs 901 may be shown. The status of some of the information inputs (or the status of the detectors that receive the information inputs) may also be shown. For example, the user interface can indicate when the system is connected to an external information input. In some variations, the external information inputs may be connected to the power management system by a wireless transmission (e.g., from an external source), and the connection to the external source may be indicated by the user interface. As described above, the user interface may accept command inputs from the driver (or a passenger) 905. In some variations, user commands may be accepted directly by using buttons on the user interface, or by voice commands. In other variations, at least some of the user commands may be entered into the power management system from another source (e.g., a separate cruise control or GPS device). Finally, the user interface may indicate the output of the power management device or system 909, typically an efficient speed output for the engine.

[0115] In some variations, the power management system may include a headway cruise control. The headway cruise control can prevent collisions when the vehicle is in motion by overriding the power management control system’s control of the vehicle speed. In some variations, the headway cruise control detects the proximity of other vehicles or obstacles in the road ahead. The headway cruise control may include sensors on the vehicle, such as laser, ultrasound or other electronic distance measurement devices. Increasingly, more vehicles are including some sort of GPS interface to communicate with other vehicles to determine distance between the vehicles to avoid collisions.

[0116] The power management devices and systems described herein may also include a motor control mechanism. The motor/engine controller changes the motor speed by mechanical operations such as pulling on a cable to adjust gas/airflow mixture or by electrical means with either analog or digital inputs by the driver. With electric driven motors, a variable may be changed to increase or decrease motor speed. In the cruise control settings, the speed of the motor may change based algorithm in the processor.

[0117] The power management devices and systems described herein may be organized in any appropriate manner, as described above. For example, in some variations, the power management device described herein may include component parts that are connected as illustrated in FIG. 10. FIG. 10 shows a schematic of one variation of a power management device. In FIG. 10, the power management system includes a central processor 1001 (CPU) that can execute control logic such as power management control logic, statistical destination logic, simulated energy requirement logic, statistical route analysis logic, derived efficient speed logic, polling logic, etc. This CPU receives inputs from sensors 1005, GPS receiver 1007, a clock 1011, a telemetry data receiver 1009, a speech recognition processor 1021 (including a microphone 1019, 1025), user interface buttons 1039, 1037, and memory components (including RAM 1035, a long-term memory 1033, firmware ROM 1031, and a removable memory 1029, 1041). The CPU may also coordinate output through the LCD display 1015, 1017, a speaker 1023, 1027, and the motor control mechanism (motor controller) 1043. In some variations, the sensors 1045 may also be included as part of the power management devices or systems.

[0118] As described above, the power management system may also be used with a telemetry system. Thus, the power management system may communicate with one or more external components. For example, the power management system may store information in a remote memory. The power management system may also contribute to a database of information about route, road conditions, and the like, such as a database of historical route information. In some variations, the motor control system may remotely communicate with a processor, so that at least some of the control logic is applied remotely.

[0119] FIG. 11 shows a schematic illustrating the use of telemetry by the motor control system. In FIG. 11, a power management device 1101 communicates by wireless communication with a database 1107 through a transmitter/receiver 1105 (shown as a satellite). Any reasonable type of wireless communications may be used, including cellular, wireless internet connections, radio, or the like. In this example, the database may both receive data from the power management device and/or transmit data or instructions to the power management device. Communication between the power management device and other components that are remotely located (e.g., memory, processor, information inputs) may also be used to update or correct the power management device. For example, the operational parameters of the vehicle may be revised or updated from a remote source. In some variations, control logic (e.g., power management control logic) may be remotely updated or revised.

[0120] The concepts described above may be used in various combinations to optimize the power used by a vehicle. Examples of power management systems, including methods of using them, are described below.

EXAMPLES

1. Fuel Efficient Hybrid vehicle

[0121] Using one variation of the power management system described herein (e.g., a power management system having an integrated with a GPS), a hybrid car approaching a large hill or grade can adjust the ratio of electric to ICE such that the batteries would be empty at the crest of the hill and fully charged at the bottom of the hill, and therefore would use less gasoline.

[0122] The same methods described above could be used to calculate the energy usage of the vehicle as in the previous example. The mix of electric to ICE can be based on the calculated energy usage and the energy stored in the batteries. The exact mechanism for instructing the hybrid vehicle to alter its electric/ICE ratio may vary between manufacturers.

2. Fuel Efficient Internal Combustion Engine (ICE) vehicle

[0123] Using one variation of the power management system described herein, an ICE car will speed up on a downhill when it knows that an uphill is the next terrain, and thereby use

momentum to get up the hill, using less gasoline. FIG. 1B illustrates this Example. As described previously, the system may determine the optimum energy using external and internal sensors and information, including the operational parameters appropriate to the vehicle. Such operational parameters may vary from manufacturer to manufacturer (or vehicle to vehicle), and, as described above, could involve sending an electrical signal to a computer-based motor controller or even mechanically controlling the gas/air-flow mixture to the engine.

3. Energy efficient Solar-powered vehicle

[0124] Using one variation of the power management system described herein, a solar-powered car can ensure that it has adequate power to traverse a predetermined route. The power management system may ensure that there is enough solar energy power for the route by slowing and speeding the car as necessary based on current energy levels and anticipated energy needs.

[0125] This example is similar to the example discussed when determining the optimum speed above, with a couple of additional steps. In addition to calculating the energy usage, the system may also include a solar array model that could model the power generated by the solar array throughout the route base on the predicted weather, geographic location, and time of day. A battery model may also be included to keep track of the energy put into the batteries by the solar array, and the energy drawn from the batteries by the motor. When selecting the optimum speeds to drive the segments of the route, the system logic (e.g., software, hardware or both), may apply or access the battery model to prevent the battery from becoming completely drained.

4. Preventing Engine Flooding

[0126] One of the keys to efficient driving is not to step on the accelerator more than the engine can actually burn and use efficiently. Flooding the engine not only wastes gas but it doesn't maximize power, despite the drivers' demands. According to one variation of the power management system described herein, a traditional ICE engine may be protected from flooding of the engine using the power management device.

[0127] In this variation of a power management device, power management device receives information inputs including a command input (acceleration), at least two environmental inputs (air resistance), the operational status of the vehicle (velocity and engine temperature), and at least one operational parameter (e.g., maximum fuel volume). For example, the power management device may receive information about the amount of pressure that the driver is applying to the accelerator. The power management system may also detect the current speed, resistance and temperature of the vehicle. This information input may be used to select the proper operational parameter of the vehicle. For example, the device may include a memory having a table of maximum fuel volumes for a given velocity, resistance and temperature. Thus, the velocity, resistance and temperature data may be used to look up a maximum fuel volume. In some variations, the maximum fuel volume may be calculate or estimated from this data. By comparing the operator demand (for acceleration) to supply fuel with the maximum amount of fuel that the engine can handle, the power management control logic may correct for the drivers inefficiency, and instruct the motor control mechanism to provide the actual maximum amount of fuel to the engine, thereby avoiding flooding of the engine.

[0128] This is a last example is a very simplified case of the overall actions of the power management control system. In general, the power management device intervenes between the driver and the engine. Thus, the power management device may interpret the driver commands so that the driving objective is achieved while maximizing the efficiency of the vehicle based on information that is not generally accessible or interpretable by the driver.

[0129] While the invention has been described in terms of particular variations and illustrative figures, those of skill in the art will recognize that the invention is not limited to the variations or figures described. In addition, where methods and steps described above indicate certain events occurring in certain order, those of skill in the art will recognize that the ordering of certain steps may be modified and that such modifications are in accordance with the variations of the invention. Additionally, certain steps may be performed concurrently in a parallel process when possible, as well as performed sequentially as described above. Therefore, to the extent there are variations of the invention, which are within the spirit of the disclosure or equivalent to the inventions found in the claims, it is the intent that this patent will cover those variations as well.

Finally, all publications and patent applications cited in this specification are herein incorporated by reference in their entirety as if each individual publication or patent application were specifically and individually put forth herein.

CLAIMS

What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A device for managing the power consumption of an automotive vehicle comprising:
power management logic operable to calculate an applied power for the vehicle engine from:
information about the external environment of the vehicle;
information about the operational status of the vehicle;
one or more command inputs; and
one or more operational parameters of the vehicle.
2. The device of claim 1, further comprising a processor responsive to the power management logic.
3. The device of claim 2, wherein the processor comprises a microprocessor.
4. The device of claim 1, further comprising a motor control mechanism, wherein the motor control mechanism controls the application of power to the vehicle engine.
5. The device of claim 1, wherein information about the external environment of the vehicle is selected from the group consisting of: the current location of the vehicle, the elevation of the vehicle, upcoming elevations of the vehicle, the current slope/grade of road, the predicted slope/grade of the next segments of road, traffic surrounding the vehicle, the location of stoplights, the timing of stoplights, a map of the roadway, the present angle of the sun, the predicted angle of the sun for upcoming route segments, the weather around the vehicle, present wind direction, the predicted wind direction for upcoming route segments, present wind velocity, the predicted wind velocity for upcoming route segments, current temperature, the predicted temperature for upcoming route segments, current air pressure, predicted air pressure for upcoming route segments, time of day, date, day of week, visibility, present road conditions, predicted road conditions for upcoming route segments, and the distance from other vehicles.

6. The device of claim 1, wherein information about the operational status of the vehicle is selected from the group consisting of: the vehicle's current speed, the motor speed, the vehicle's current orientation, the RPM of the vehicle's motor, wheel rotations per minute, the battery state, the voltage of the battery, the amp hours from the battery, the state of the battery, temperature of battery, the age of the battery, and the number of times the battery has charged and discharged, the tire pressure, the drag force due to rolling resistance of the vehicle, the weight of vehicle, the amount of air going to the engine, the amount of gas going to engine, and the weight of driver.
7. The device of claim 1, wherein the command input is selected from the group consisting of: the acceleration applied by a driver, the braking applied by a driver, the vehicle's known or predicted final destination, the vehicle's known or predicted interim destination, preferred speed, maximum and minimum range over which speed should adjust, and preferred route.
8. The device of claim 1, wherein the operational parameter of the vehicle is selected from the group consisting of: aerodynamic parameters (CDA), rolling resistance parameters (Crr1 and Crr2), drive train efficiency parameters, motor efficiency parameters, and battery model parameters, battery charge and discharge relationships, type of battery.
9. The device of claim 1, further comprising a memory containing vehicle information about one or more operational parameters for the vehicle.
10. The device of claim 1, wherein the vehicle engine comprises an engine selected from the group consisting of: an internal combustion engine (gasoline, diesel, ethanol and other derivatives), a hybrid internal combustion/electric engine, an electric engine powered by the electric grid (plug-in), an electric engine powered by the sun (solar), an electric engine powered by hydrogen fuel cell.
11. A system for managing the power consumption of an automotive vehicle, comprising:
 - a first input, operable to receive information about the external environment of the vehicle;
 - a second input, operable to receive information about the operational status of the vehicle;

a third input, operable to receive one or more command inputs from a driver of the vehicle;
a memory containing vehicle information about one or more operational parameters of the vehicle;
power management logic operable to calculate an applied power for the vehicle engine from the first input, the second input, the third input, and the memory; and
a processor responsive to the power management logic.

12. The system of claim 11, further comprising a motor control mechanism, wherein the motor control mechanism regulates the application of power to the vehicle engine.
13. The system of claim 11, wherein the first input is selected from the group consisting of: the current location of the vehicle, the elevation of the vehicle, upcoming elevations of the vehicle, the current slope/grade of road, the predicted slope/grade of the next segments of road, the vehicle's known or predicted final destination, the vehicle's known or predicted interim destination, traffic surrounding the vehicle, the location of stoplights, the timing of stoplights, a map of the roadway, the present angle of the sun, the predicted angle of the sun for upcoming route segments, the weather around the vehicle, present wind direction, the predicted wind direction for upcoming route segments, present wind velocity, the predicted wind velocity for upcoming route segments, current temperature, the predicted temperature for upcoming route segments, current air pressure, predicted air pressure for upcoming route segments, time of day, date, day of week, visibility, present road conditions, predicted road conditions for upcoming route segments, and the distance from other vehicles..
14. The system of claim 11, wherein the second input is selected from the group consisting of: the vehicle's current speed, the motor speed, the vehicle's current orientation, the RPM of the vehicle's motor, wheel rotations per minute, the battery state, the voltage of the battery, the amp hours from the battery, the state of the battery, temperature of battery, the age of the battery, and the number of times the battery has charged and discharged, the tire pressure, the drag force due to rolling resistance of the vehicle, the weight of vehicle, the amount of air going to the engine, the amount of gas going to engine, and the weight of driver.

15. The system of claim 11, wherein the third input is selected from the group consisting of: the acceleration applied by a driver, the braking applied by a driver, the intended destination, preferred speed, maximum and minimum range over which speed should adjust, and preferred route.
16. The system of claim 11, wherein the memory includes at least one operational parameter of the vehicle selected from the group consisting of: aerodynamic parameters (CDA), rolling resistance parameters (Crr1 and Crr2), drive train efficiency parameters, motor efficiency parameters, and battery model parameters, battery charge and discharge relationships, type of battery.
17. A method of managing the power consumption of a vehicle, comprising:
 - calculating an applied power for the vehicle using a processor, the processor receiving:
 - a first input comprising information about the environment of the vehicle;
 - a second input comprising information about the operational status of the vehicle;
 - a third input comprising a command input from the driver of the vehicle;
 - a fourth input comprising vehicle information about the operational parameters of the vehicle.
18. The method of claim 17, further comprising applying the applied power to the engine of the vehicle.
19. The method of claim 17, wherein the step of calculating an applied power further comprises:
 - determining a route;
 - segmenting the route into one or more segment destinations;
 - calculating an energy efficient speed for the vehicle to travel to the segment destination;
 - determining a target speed for the vehicle to travel to the segment destination; and
 - calculating the applied power from the target speed.

20. The method of claim 19, further comprising continuously calculating the applied power until a final destination is reached.
21. The method of claim 19, wherein the step of determining a target speed for the vehicle further comprises determining a historical speed for a similar destination.
22. The method of claim 17, further comprising notifying the operator of the vehicle of the calculated applied power.

ABSTRACT

Described herein are devices, systems, and methods for managing the power consumption of an automotive vehicle, and thereby for optimizing the power consumption of the vehicle. The devices and systems for managing the power consumption of the vehicle typically include power management logic that can calculate an applied power for the vehicle engine based on information provided from the external environment of the vehicle, the operational status of the vehicle, one or more command inputs from a driver, and one or more operational parameters of the vehicle.

Fig. 1A

Typical Cruise Control Today (Velocity Control)

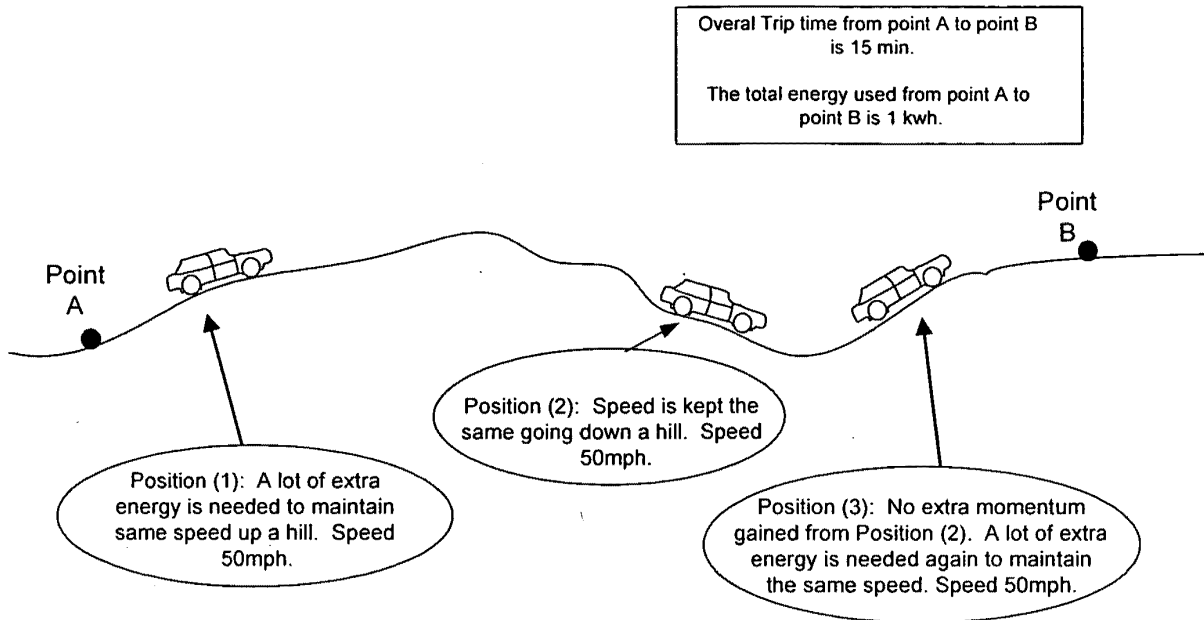


Fig. 1B

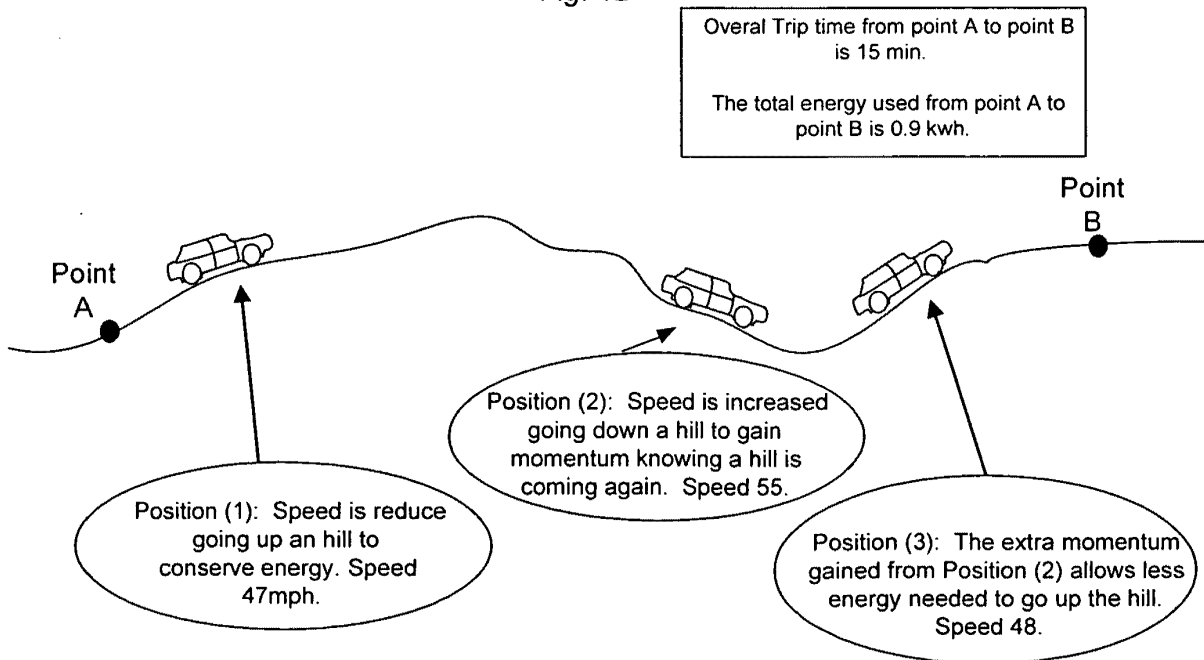


Fig. 2

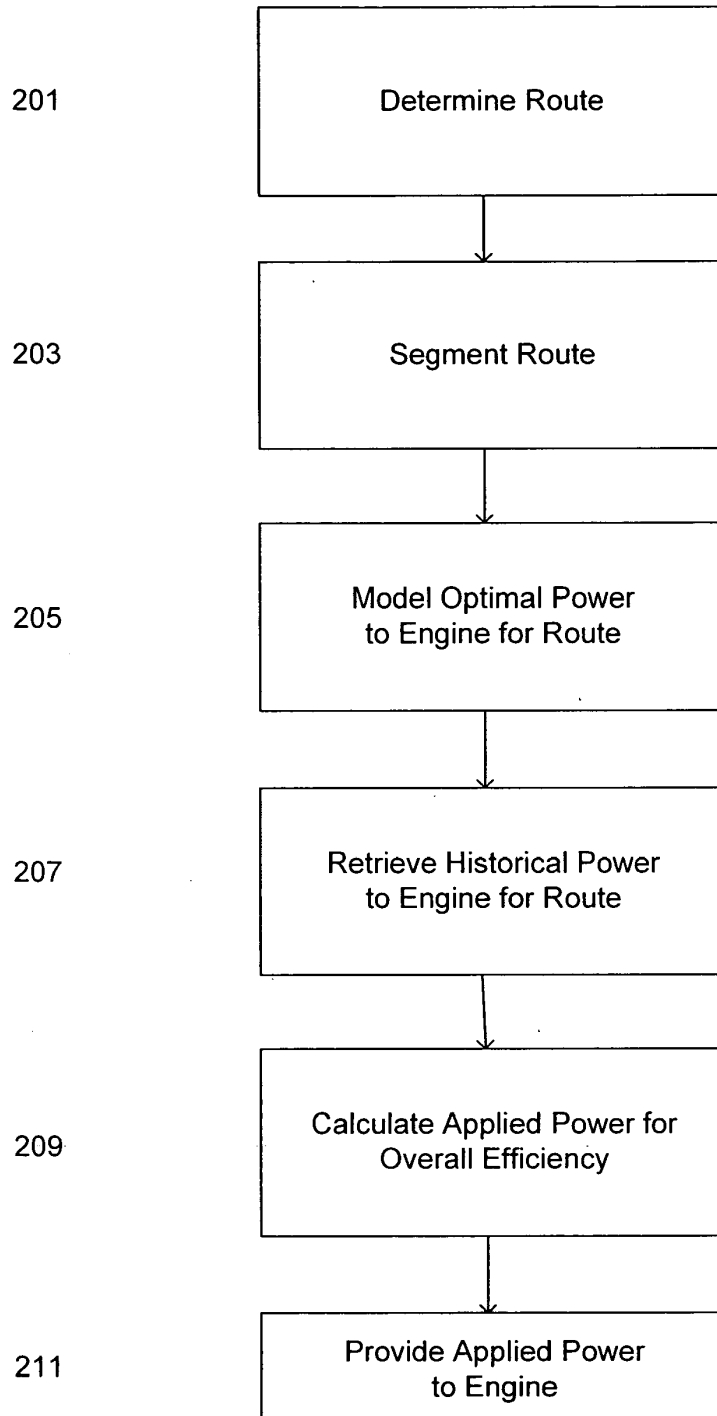


Fig. 3A

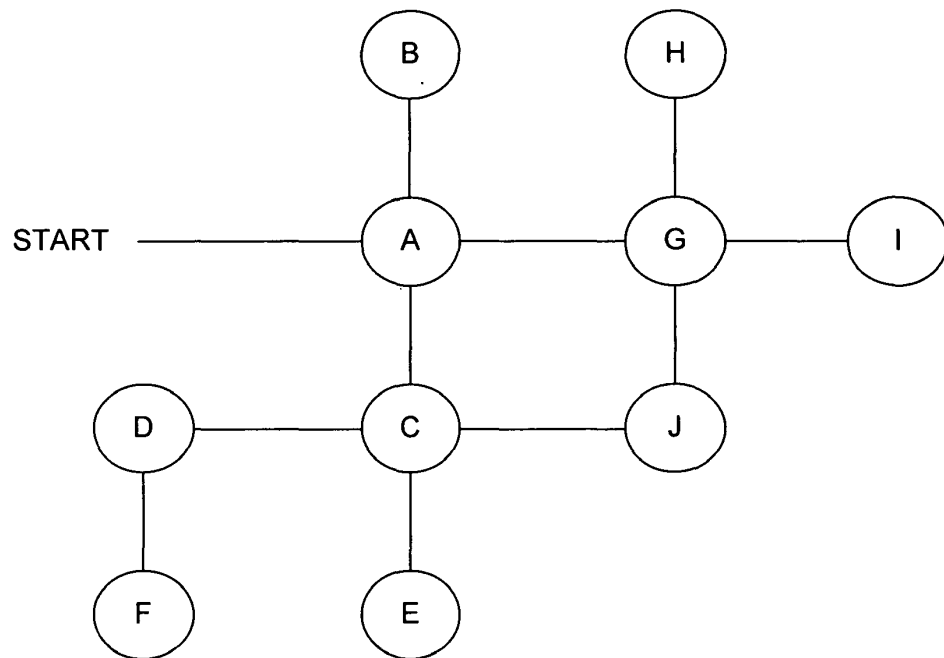


Fig. 3B

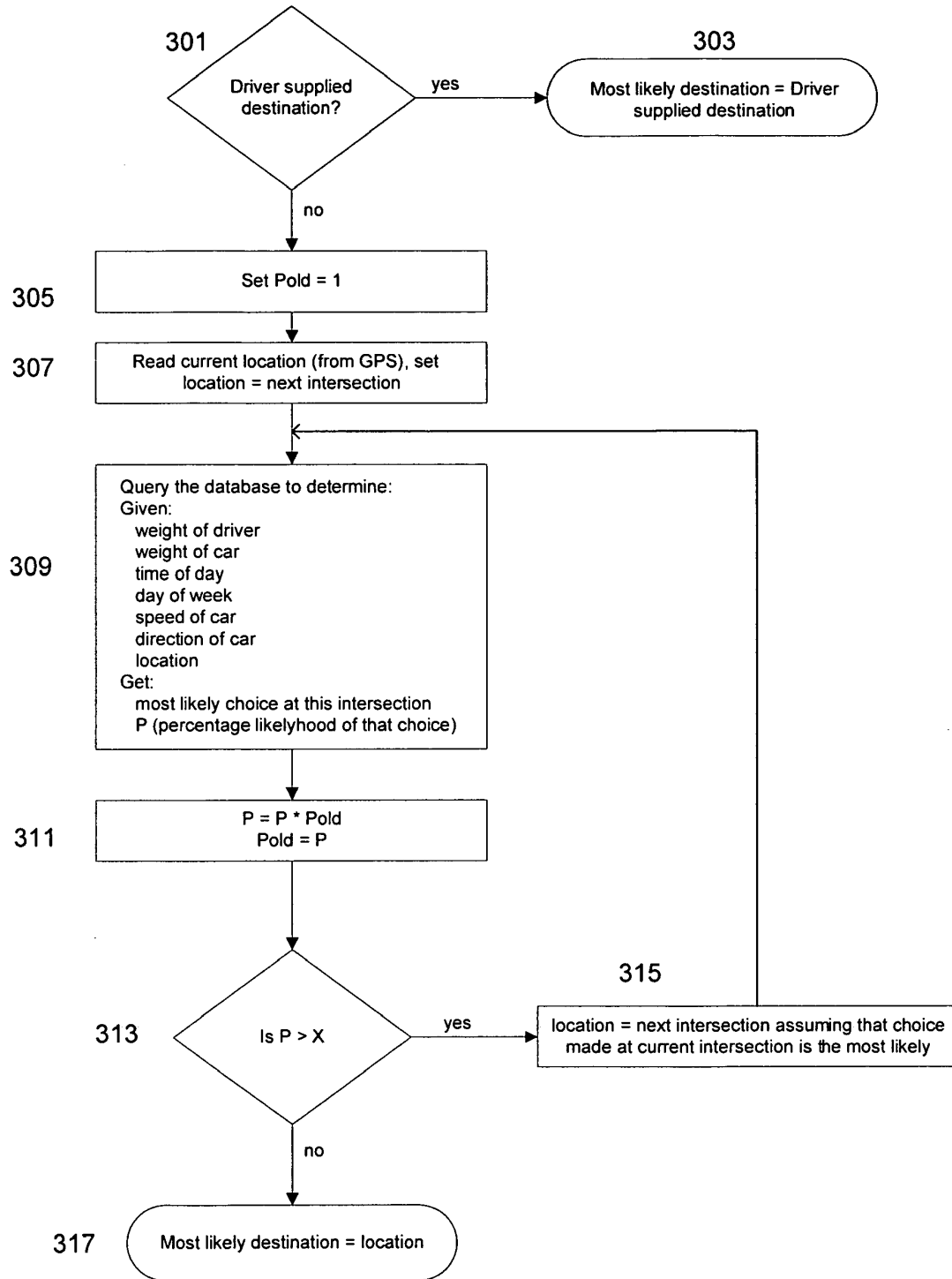


Fig. 4

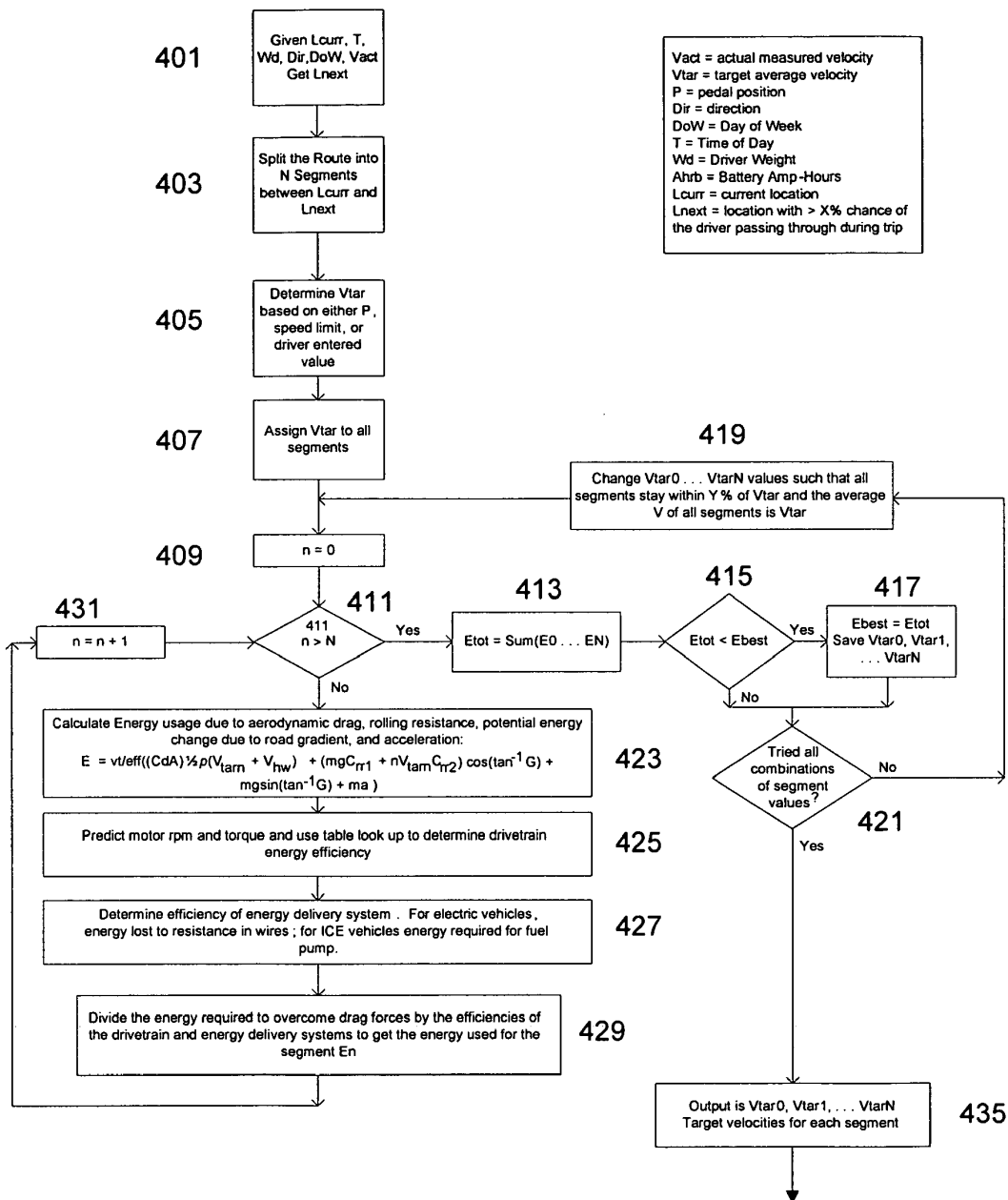


Fig. 5

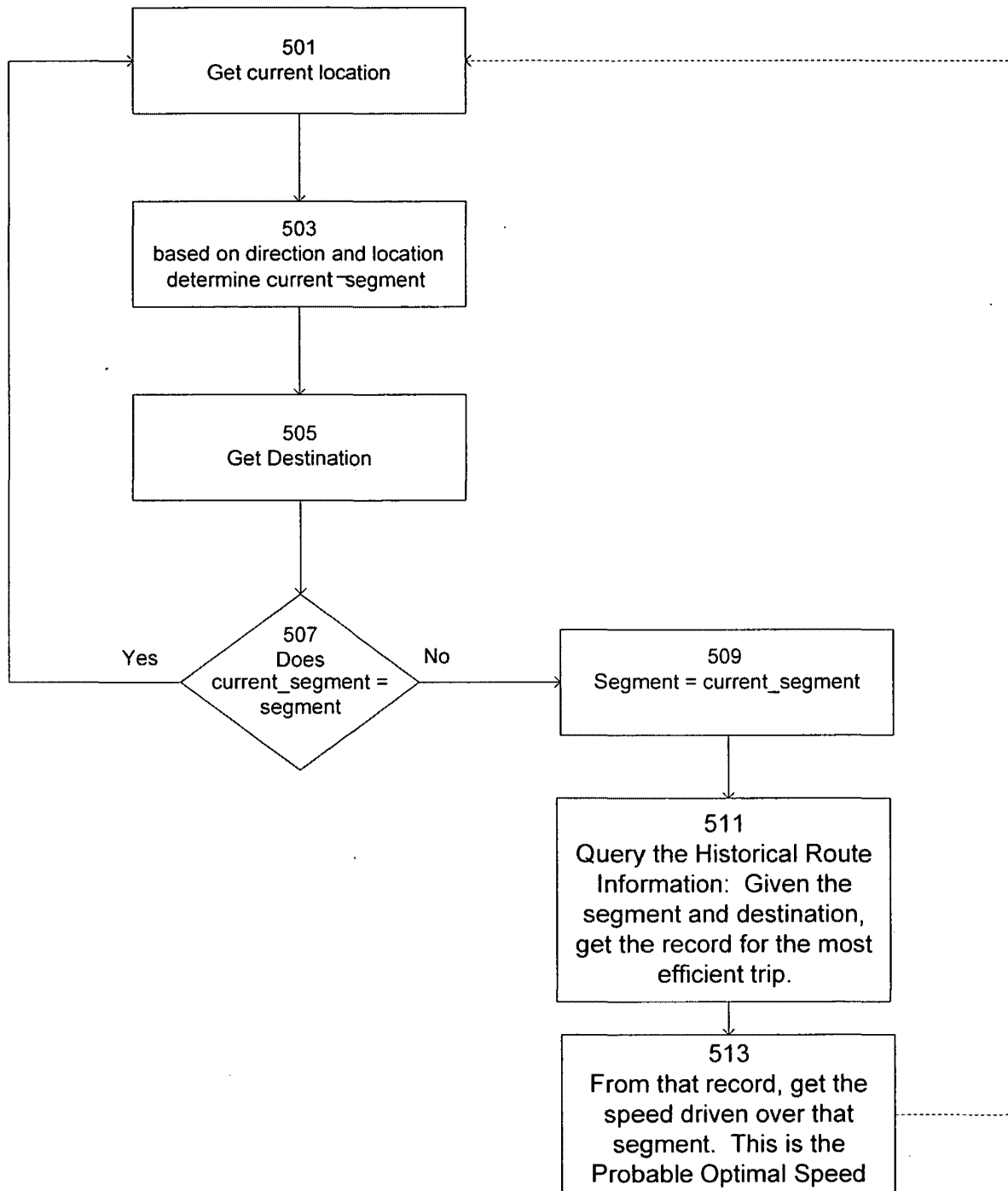


Fig. 6

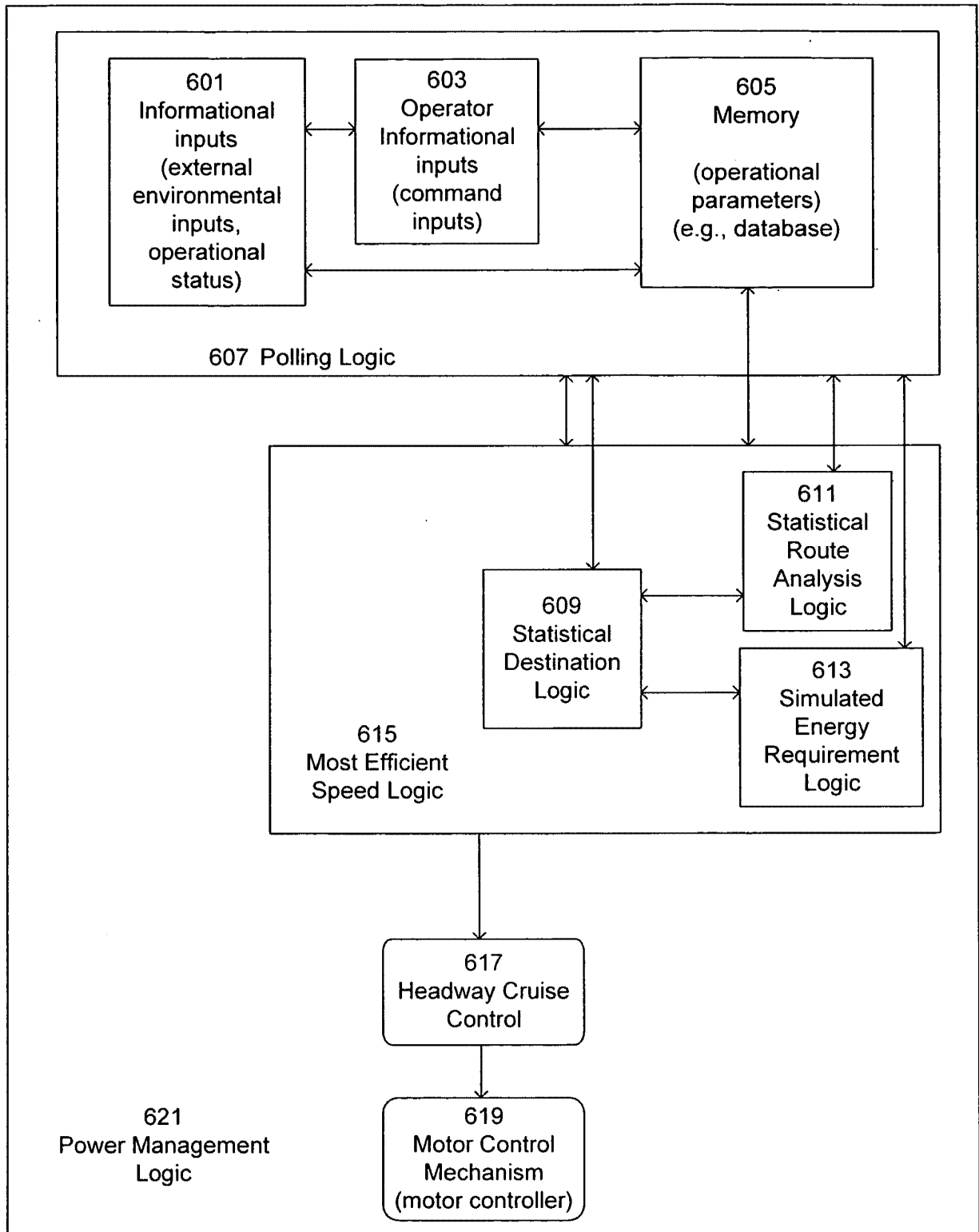


Fig. 7

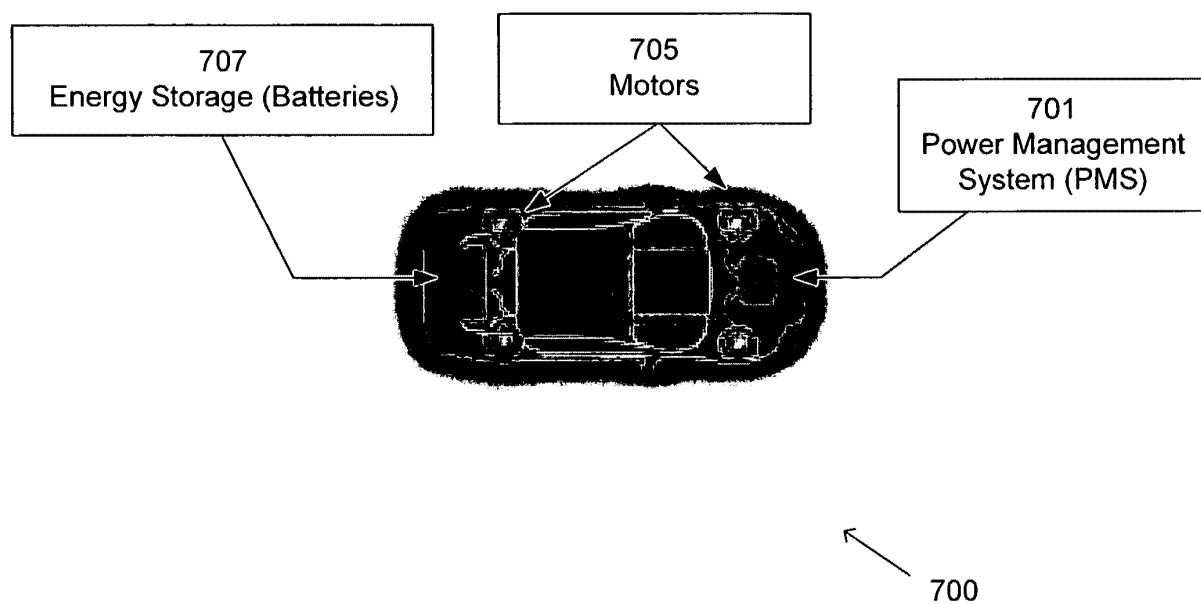


Fig. 8

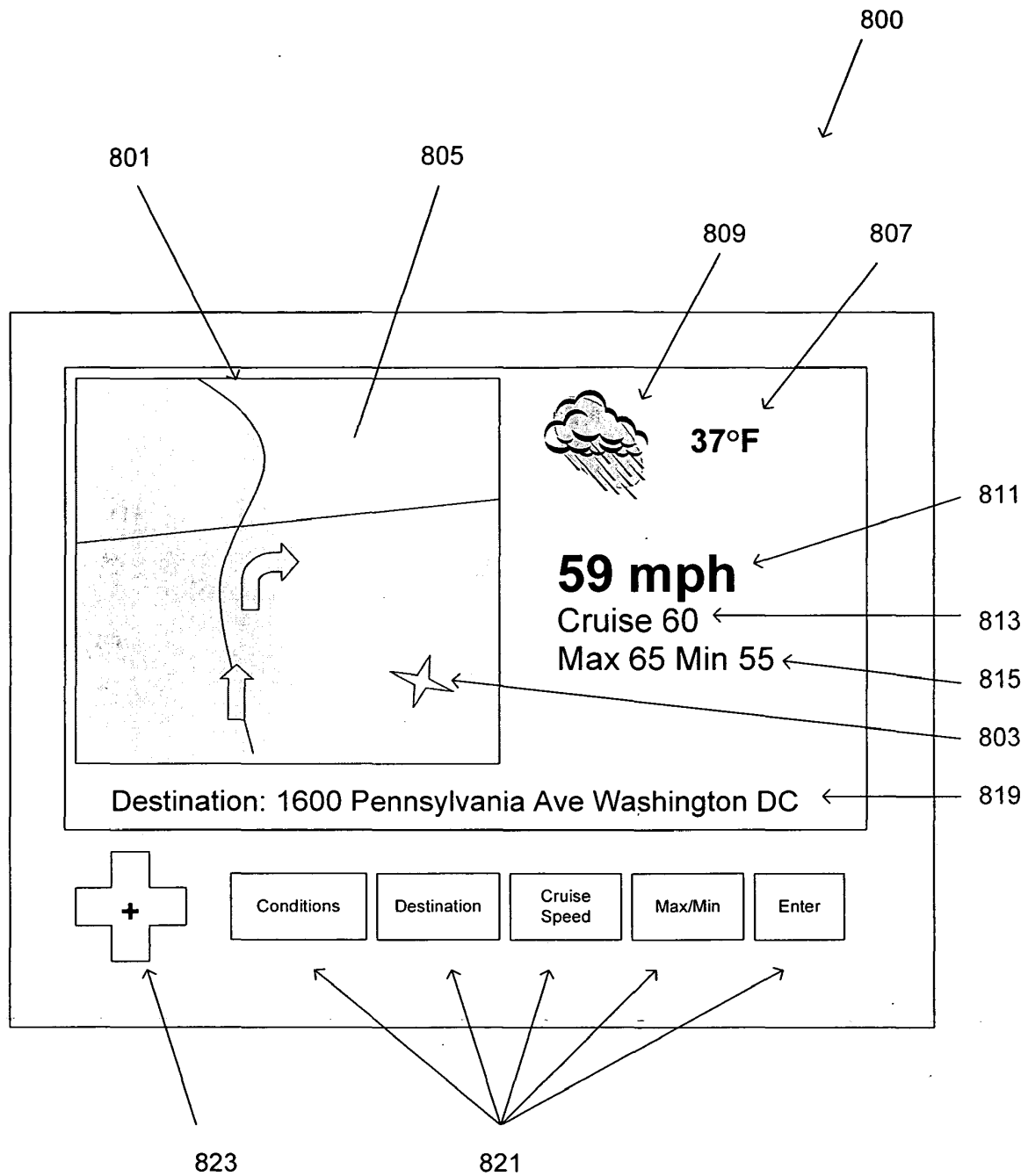


Fig. 9

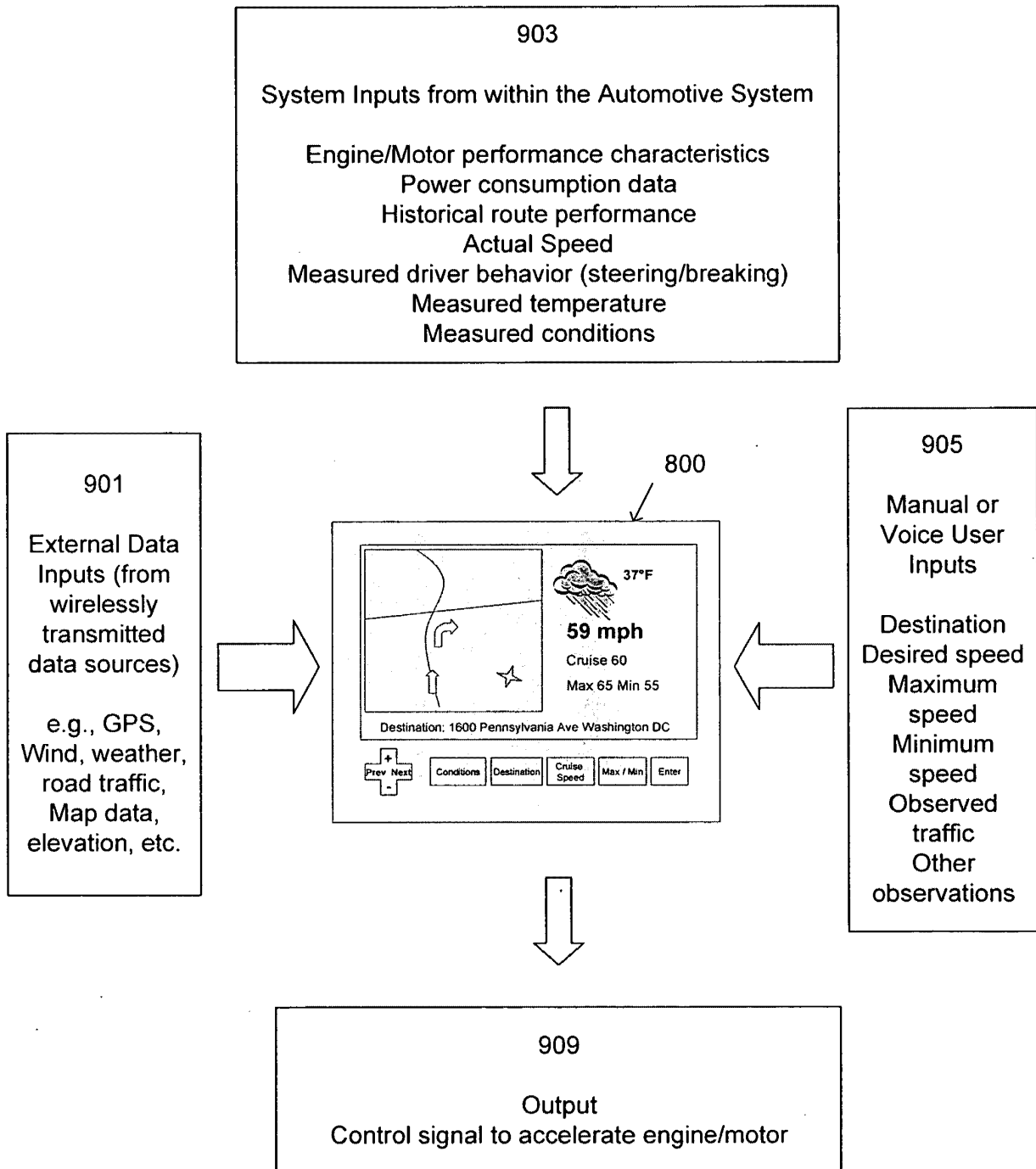


Fig. 10

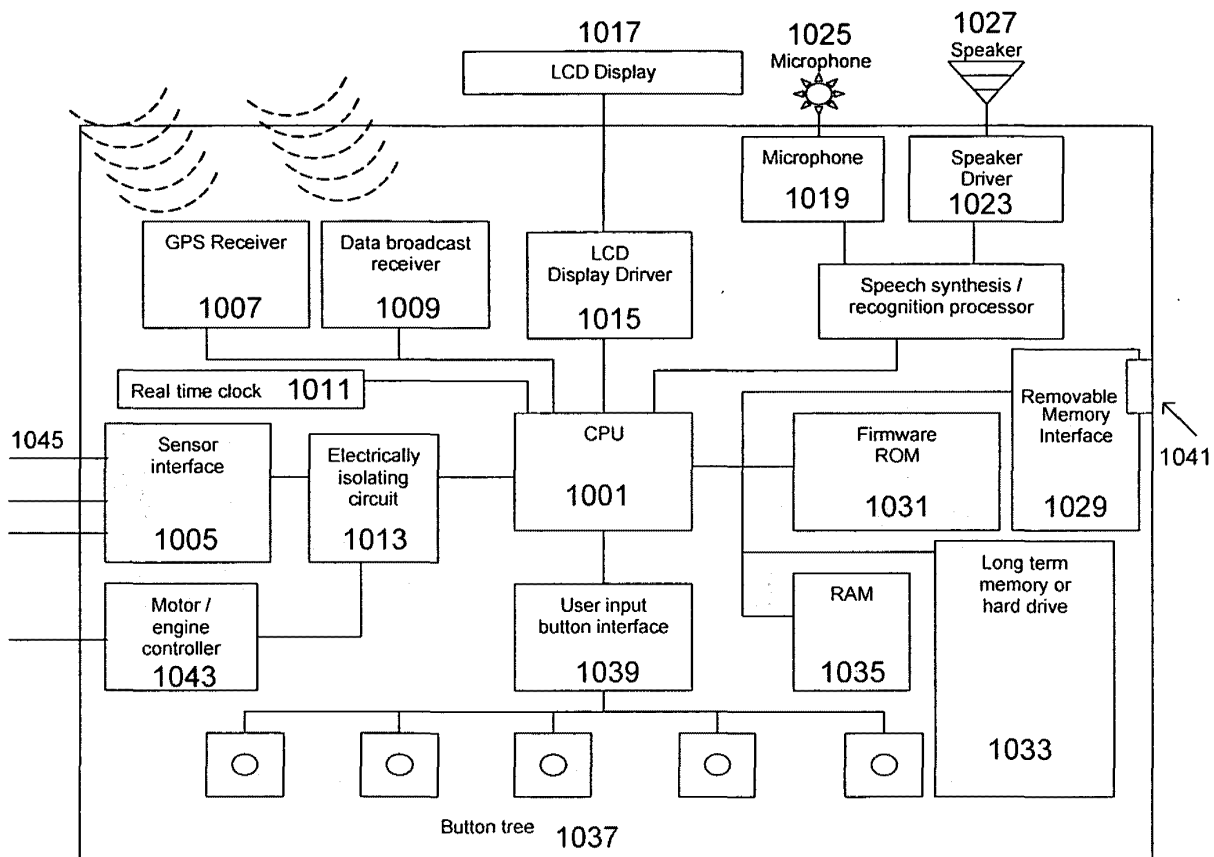


Fig. 11

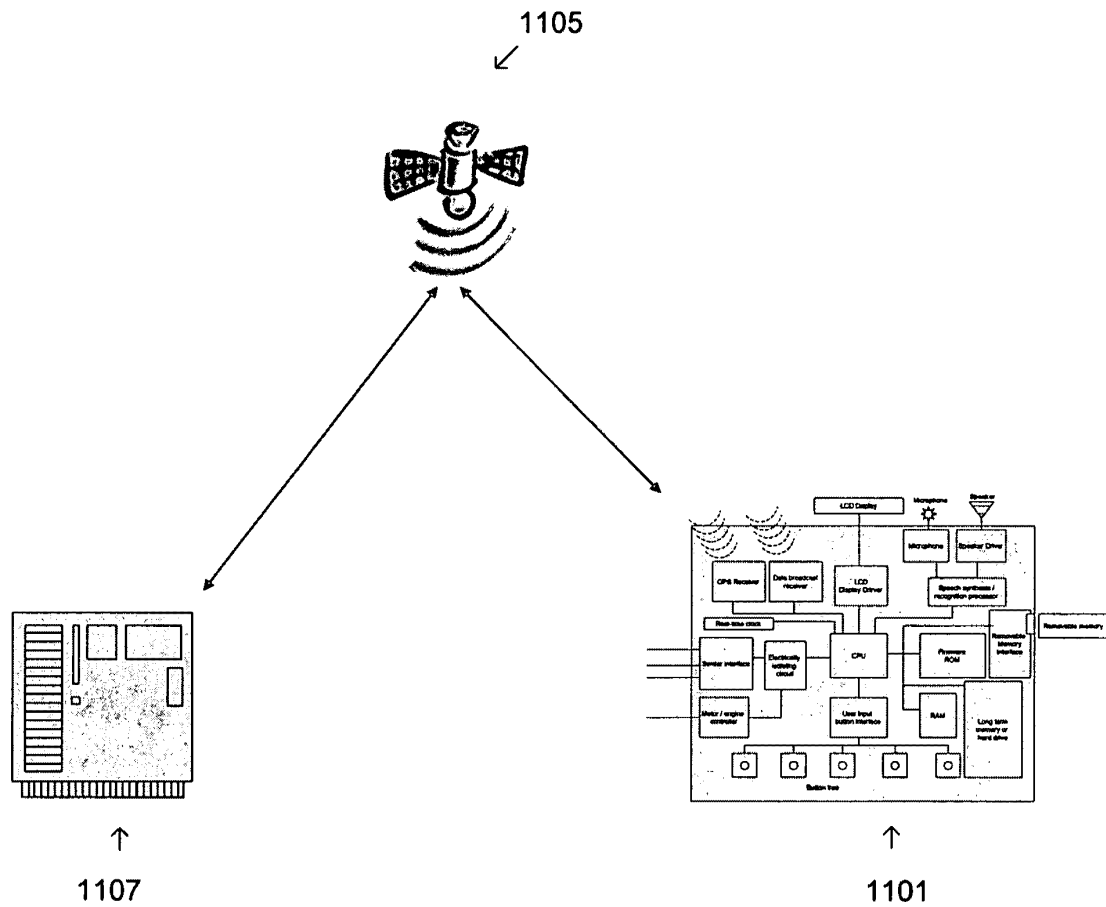


Fig. 12A

Li-Po 40 Ah

Charge : CC-CV 0.5 C / 1 C / 2 C - 4.2 V 0.05 C cut-off @23°C

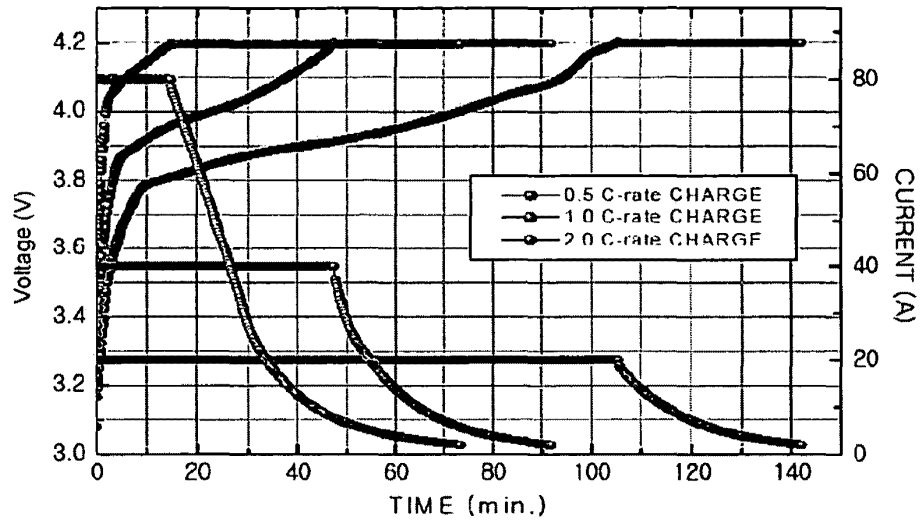


Fig. 12B

Li-Po 40 Ah

Discharge : CC, 1 C, 3 C, 5 C, 8 C, 10 C 2.7 V cut-off

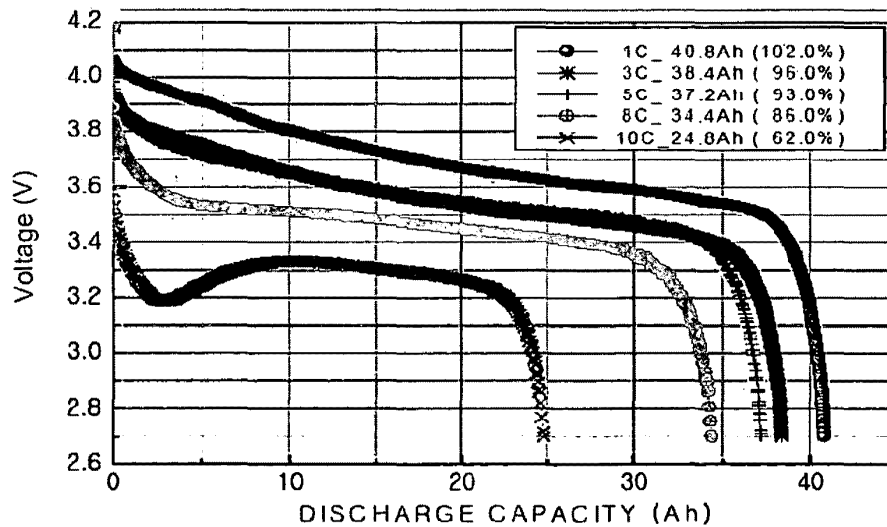


Fig. 13A

Torque-Speed Envelope
AC55 with UMOC440TF @ 312VDC

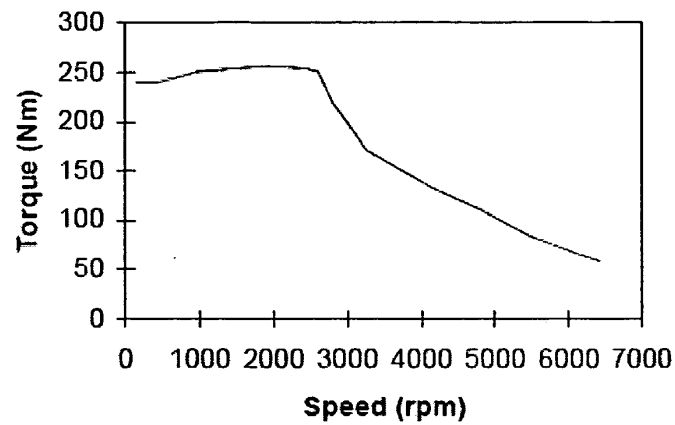
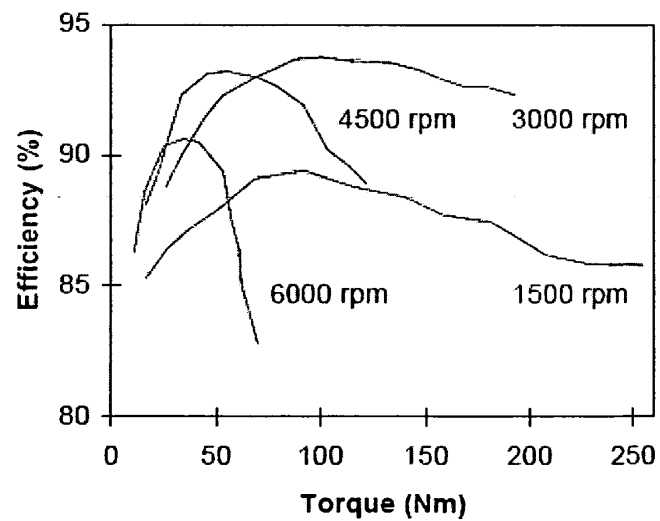


Fig. 13B

Efficiency vs. Torque
AC55 with UMOC440TF @ 312 VDC



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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)	
Title of Invention	POWER MANAGEMENT SYSTEMS AND DEVICES
As the below named inventor(s), I/we declare that:	
This declaration is directed to:	
☒ The attached application, or	
☐ Application No. _____, filed on _____	
☐ as amended on _____ (if applicable);	
I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;	
I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;	
I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability 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 national or PCT international filing date of the continuation-in-part application.	
All statements made herein of my/our own knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.	

FULL NAME OF INVENTOR(S)	
Inventor one:	Martin KOEBLER
Signature:	<i>Martin Koebler</i> Citizen of: Germany
Inventor two:	Nicole G. GOLDSTEIN
Signature:	_____ Citizen of: US
Inventor three:	Stephen J. BROWN
Signature:	_____ Citizen of: US
Inventor four:	Jason H. HARPER
Signature:	_____ Citizen of: US
☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.	

Attorney Docket No.: 601392000100

Page 1 of 1

PA-1022859

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PTO/SB/01A (09-04)

Approved for use through 07/31/2006, OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	POWER MANAGEMENT SYSTEMS AND DEVICES
--------------------	--------------------------------------

As the below named inventor(s), I/we declare that:

This declaration is directed to:

☒ The attached application, or☐ Application No. _____, filed on _____.☐ as amended on _____ (if applicable);

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability 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 national or PCT international filing date of the continuation-in-part application.

All statements made herein of my/our own knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR(S)Inventor one: Martin KOEBLERSignature: _____ Citizen of: GermanyInventor two: Nicole G. GOLDSTEINSignature: _____ Citizen of: USInventor three: Stephen J. BROWNSignature: _____ Citizen of: USInventor four: Jason H. HARPERSignature: _____ Citizen of: US☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

Attorney Docket No.: 601392000100

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)**Title of Invention** POWER MANAGEMENT SYSTEMS AND DEVICES

As the below named inventor(s), I/we declare that:

This declaration is directed to:

☒ The attached application, or☐ Application No. _____, filed on _____,☐ as amended on _____ (if applicable);

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability 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 national or PCT international filing date of the continuation-in-part application.

All statements made herein of my/our own knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR(S)Inventor one: Martin KOEBLERSignature: _____ Citizen of: GermanyInventor two: Nicole G. GOLDSTEINSignature: _____ Citizen of: USInventor three: Stephen J. BROWNSignature: [Signature] Citizen of: USInventor four: Jason H. HARPERSignature: _____ Citizen of: US☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

Attorney Docket No.: 601392000100

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	POWER MANAGEMENT SYSTEMS AND DEVICES
--------------------	--------------------------------------

As the below named inventor(s), I/we declare that:

This declaration is directed to:

☒ The attached application, or☐ Application No. _____, filed on _____.☐ as amended on _____ (if applicable);

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability 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 national or PCT International filing date of the continuation-in-part application.

All statements made herein of my/our own knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR(S)Inventor one: Martin KOEBLERSignature: _____ Citizen of: GermanyInventor two: Nicole G. GOLDSTEINSignature: _____ Citizen of: USInventor three: Stephen J. BROWNSignature: _____ Citizen of: USInventor four: Jason H. HARPERSignature: Jason Harper Citizen of: US☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

Attorney Docket No.: 601392000100

PTO/SB/81 (04-05)

Approved for use through 11/30/2005. OMB 0651-0035
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POWER OF ATTORNEY and CORRESPONDENCE ADDRESS INDICATION FORM	Application Number		Not Yet Assigned	
	Filing Date		Concurrently Herewith	
	First Named Inventor		Martin KOEBLER	
	Title		POWER MANAGEMENT SYSTEMS AND DEVICES	
	Art Unit		Not Yet Assigned	
	Examiner Name		Not Yet Assigned	
	Attorney Docket No.		601392000100	

I hereby revoke all previous powers of attorney given in the above-identified application.

I hereby appoint:

☒ Practitioners associated with the Customer Number: 25226

OR

☐ Practitioner(s) named below:

Name	Registration Number	Name	Registration 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.

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.

☒ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

SIGNATURE of Applicant or Assignee of Record

Signature	Date
NA	11-16-05
Name	Telephone
Nicole G. Goldstein	650-529-1905
Title and Company	
Vice President, Business Operations - Motility Systems, Inc.	

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.

PA-1023024

PTO/SB/96 (09-04)
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Martin KOEBLER et al.

Application No./Patent No.: Not Yet Assigned Filed/Issue Date: Concurrently Herewith

Entitled: POWER MANAGEMENT SYSTEMS AND DEVICES

Motility Systems, Inc. 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; or
2. ☐ an assignee of less than the entire right, title and interest.
 The extent (by percentage) of its ownership interest is _____ %
 in 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 _____, Frame _____, or for which a copy thereof is attached.

OR

- B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

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.

- ☐ Copies of assignments or other documents in the chain of title are attached.
 (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, if the assignment is to be recorded 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.

Nicole G. Goldstein
 Signature
 Nicole G. Goldstein
 Printed or Typed Name
 Vice President, Business Operations
 Title

11-16-05
 Date
650-529-1905
 Telephone Number

Attorney Docket No.: 601392000100

PA-1023025

ASSIGNMENT
JOINT

COPY

THIS ASSIGNMENT, by Martin KOEBLER, Nicole G. GOLDSTEIN, Stephen J. BROWN and Jason H. HARPER (hereinafter referred to as the assignors), residing at Lindenstrasse 11, Saal/Donau, D-93342 Germany, 188 Alta Mesa Road, Woodside, California 94062, 3324 Woodside Road, Woodside, California 94062, and 5250 Crestline Way, Pleasanton, California 94566, respectively, witnesseth:

WHEREAS, said assignors have invented certain new and useful improvements in POWER MANAGEMENT SYSTEMS AND DEVICES, set forth in an application for Letters Patent of the United States, having an oath or declaration executed on even date herewith; and

WHEREAS, Motility Systems, Inc., a corporation duly organized under and pursuant to the laws of Delaware and having its principal place of business at 188 Alta Mesa Road, Woodside, California 94062 (hereinafter referred to as the assignee) is desirous of acquiring the entire right, title and interest in and to said inventions and said application for Letters Patent of the United States, and in and to any Letters Patent or Patents, United States or foreign, to be obtained therefor and thereon:

NOW, THEREFORE, in consideration of One Dollar (\$1.00) and other good and sufficient consideration, the receipt of which is hereby acknowledged, said assignors have sold, assigned, transferred and set over, and by these presents do sell, assign, transfer and set over, unto said assignee, its successors, legal representatives and assigns, the entire right, title and interest in and to the above-mentioned inventions, application for Letters Patent, and any and all Letters Patent or Patents in the United States of America and all foreign countries which may be granted therefor and thereon, and in and to any and all divisions, continuations and continuations-in-part of said application, or reissues or extensions of said Letters Patent or Patents, and all rights under the International Convention for the Protection of Industrial Property, the same to be held and enjoyed by said assignee, for its own use and the use of its successors, legal representatives and assigns, to the full end of the term or terms for which Letters Patent or Patents may be granted, as fully and entirely as the same would have been held and enjoyed by the assignors, had this sale and assignment not been made.

AND for the same consideration, said assignors hereby covenant and agree to and with said assignee its successors, legal representatives and assigns, that, at the time of execution and delivery of these presents, said assignors are the sole and lawful owners of the entire right, title and interest in and to said inventions and the application for Letters Patent above-mentioned, and that the same are unencumbered and that said assignors have good and full right and lawful authority to sell and convey the same in the manner herein set forth.

AND for the same consideration, said assignors hereby covenant and agree to and with said assignee, its successors, legal representatives and assigns, that said assignors will, whenever counsel of said assignee, or the counsel of its successors, legal representatives and assigns, shall advise that any proceeding in connection with said inventions, or said application for Letters Patent, or any proceeding in connection with Letters Patent for said inventions in any country, including interference proceedings, is lawful and desirable, or that any division, continuation or continuation-in-part of any application for Letters Patent or any reissue or extension of any Letters Patent, to be obtained thereon, is lawful and desirable, sign all papers and documents, take all lawful oaths, and do all acts necessary or required to be done for the procurement, maintenance, enforcement and defense of Letters Patent for said inventions, without charge to said assignee, its successors, legal representatives and assigns, but at the cost and expense of said assignee, its successors, legal representatives and assigns.

FROM :

FAX NO. :

Jul. 21 2003 09:36AM P1

Attorney Docket No.: 601392000100

AND said assignors hereby request the Commissioner of Patents to issue said Letters Patent of the United States to said assignee as the assignee of said inventions and the Letters Patent to be issued thereon for the sole use of said assignee, its successors, legal representatives and assigns.

<u>Nov 14 2005</u> Date	<u>Martin Koebler</u> Martin KOEBLER
<u> </u> Date	<u> </u> Nicole G. GOLDSTEIN
<u> </u> Date	<u> </u> Stephen J. BROWN
<u> </u> Date	<u> </u> Jason H. HARPER

Attorney Docket No.: 601392000100

AND said assignors hereby request the Commissioner of Patents to issue said Letters Patent of the United States to said assignee as the assignee of said inventions and the Letters Patent to be issued thereon for the sole use of said assignee, its successors, legal representatives and assigns.

Date	Martin KOEBLER
11-7-06	
Date	Nicole G. GOLDSTEIN
Date	Stephen J. BROWN
Date	Jason H. HARPER

AND said assignors hereby request the Commissioner of Patents to issue said Letters Patent of the United States to said assignee as the assignee of said inventions and the Letters Patent to be issued thereon for the sole use of said assignee, its successors, legal representatives and assigns.

Date Martin KOEBLER

Date Nicole G. GOLDSTEIN
11/16/05

Date Stephen J. BROWN

Date Jason H. HARPER

AND said assignors hereby request the Commissioner of Patents to issue said Letters Patent of the United States to said assignee as the assignee of said inventions and the Letters Patent to be issued thereon for the sole use of said assignee, its successors, legal representatives and assigns.

Date	Martin KOEBLER
Date	Nicole G. GOLDSTEIN
Date	Stephen J. BROWN
11/08/05 Date	<i>Jason Harper</i> Jason H. HARPER

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PATENT APPLICATION SERIAL NO _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

11/23/2005 AKELECHI 00000041 031952 11283137

01 FC:2011	150.00 DA
02 FC:2111	250.00 DA
03 FC:2311	100.00 DA
04 FC:2202	50.00 DA

PTO-1556
(5/87)

U.S. Government Printing Office: 2002 — 498-267/89033

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875 Effective December 8, 2004

Application or Docket Number

11/283/37

APPLICATION AS FILED - PART I

(Column 1)

(Column 2)

SMALL ENTITY

OR

OTHER THAN
SMALL ENTITY

FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A
EXAMINATION FEE (37 CFR 1.16(c), (p), or (q))	N/A	N/A
TOTAL CLAIMS (37 CFR 1.16(i))	4 minus 20 =	9
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	0
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 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))		

RATE (\$)	FEE (\$)
N/A	150.00
N/A	\$250
N/A	\$100
X\$ 25 =	50.
X100 =	
+180=	
TOTAL	550.

RATE (\$)	FEE (\$)
N/A	300.00
N/A	\$500
N/A	\$200
X\$50 =	
X200 =	
+360=	
TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED - PART II

(Column 1)

(Column 2)

(Column 3)

SMALL ENTITY

OR

OTHER THAN
SMALL ENTITY

AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.16(i))	•	Minus **	=
Independent (37 CFR 1.16(h))	•	Minus ***	=
Application Size Fee (37 CFR 1.16(s))			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			

RATE (\$)	ADDITIONAL FEE (\$)
X\$ 25 =	
X100 =	
+180=	
TOTAL ADD'L FEE	

RATE (\$)	ADDITIONAL FEE (\$)
X\$50 =	
X200 =	
+360=	
TOTAL ADD'L FEE	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.16(i))	•	Minus **	=
Independent (37 CFR 1.16(h))	•	Minus ***	=
Application Size Fee (37 CFR 1.16(s))			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			

RATE (\$)	ADDITIONAL FEE (\$)
X\$ 25 =	
X100 =	
+180=	
TOTAL ADD'L FEE	

RATE (\$)	ADDITIONAL FEE (\$)
X\$50 =	
X200 =	
+360=	
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.

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.

Application Data Sheet

Application Information

Application Type::	Regular
Subject Matter::	Utility
Suggested Group Art Unit::	Not Yet Assigned
CD-ROM or CD-R?::	None
Sequence submission?::	None
Computer Readable Form (CRF)?::	No
Title::	POWER MANAGEMENT SYSTEMS AND DEVICES
Attorney Docket Number::	601392000100
Request for Early Publication?::	No
Request for Non-Publication?::	No
Total Drawing Sheets::	14
Small Entity?::	Yes
Petition included?::	No
Secrecy Order in Parent Appl.?::	No

Applicant Information

Applicant Authority Type::	Inventor
Primary Citizenship Country::	Germany
Status::	Full Capacity
Given Name::	Martin
Family Name::	KOEBLER
City of Residence::	Saal/Donau
Country of Residence::	Germany
Street of mailing address::	Lindenstrasse 11
City of mailing address::	Saal/Donau
Country of mailing address::	Germany
Postal or Zip Code of mailing address::	D-93342

Applicant Authority Type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Jason
Middle Name:: H.
Family Name:: HARPER
City of Residence:: Pleasanton
State or Province of Residence:: CA
Country of Residence:: US
Street of mailing address:: 5250 Crestline Way
City of mailing address:: Pleasanton
State or Province of mailing address:: CA
Postal or Zip Code of mailing address:: 94566

Applicant Authority Type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Stephen
Middle Name:: J.
Family Name:: BROWN
City of Residence:: Woodside
State or Province of Residence:: CA
Country of Residence:: US
Street of mailing address:: 3324 Woodside Road
City of mailing address:: Woodside
State or Province of mailing address:: CA
Postal or Zip Code of mailing address:: 94062

Applicant Authority Type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Nicole

Middle Name:: G.
Family Name:: GOLDSTEIN
City of Residence:: Woodside
State or Province of Residence:: CA
Country of Residence:: US
Street of mailing address:: 188 Alta Mesa Road
City of mailing address:: Woodside
State or Province of mailing address:: CA
Postal or Zip Code of mailing address:: 94062

Correspondence Information

Correspondence Customer Number:: 25226

Representative Information

Representative Customer Number:: 25226

Domestic Priority Information

Foreign Priority Information

Assignee Information

Assignee name:: Motility Systems, Inc.
Street of mailing address:: 188 Alta Mesa Road
City of mailing address:: Woodside
State or Province or mailing address:: CA
Postal or Zip Code of mailing address:: 94062

17224 U.S. PTO
111705

PTO/SB/05 (05-05)
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U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE

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UTILITY PATENT APPLICATION TRANSMITTAL (ONLY FOR NEW NONPROVISIONAL APPLICATIONS UNDER 37 CFR 1.53(B))		Attorney Docket No.	601392000100
		First Inventor	Martin KOEBLER
Title		POWER MANAGEMENT SYSTEMS AND DEVICES	
Express Mail Label No.		EV 595535421 US	

APPLICATION ELEMENTS See MPEP chapter 600 concerning utility patent application contents.	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450
---	---

1. ☒ Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original and a duplicate for fee processing) (2 pages) 2. ☒ Applicant claims small entity status. See 37 CFR 1.27. 3. ☒ Specification [Total Pages <u>46</u>] Both the claims and abstract must start on a new page (For information on the preferred arrangement, see MPEP 608.01(a)) 4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets <u>14</u>] 5. Oath or Declaration [Total Sheets <u>4</u>] a. ☒ Newly executed (original or copy) b. ☐ A copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional with Box 18 completed) i. ☐ DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b). 6. ☒ Application Data Sheet. See 37 CFR 1.76 (3 pages) 7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix) ☐ Landscape Table on CD 8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, items a. - c. are required) a. Computer Readable Form (CRF) i. ☐ Computer Readable Form (CRF) ii. ☐ Transfer Request (37 CFR 1.821(e)) b. Specification Sequence Listing on: i. ☐ CD-ROM or CD-R (2 copies); or ii. ☐ Paper c. ☐ Statements verifying identity of above copies	ACCOMPANYING APPLICATION PARTS 9. ☒ Assignment Papers (cover sheet & document(s)) (6 pages) Name of Assignee: Motility Systems, Inc. 10. ☒ 37 CFR 3.73(b) Statement ☒ Power of Attorney (1 page) (when there is an assignee) (plus copy of Assignment) (6 pages) 11. ☐ English Translation Document (if applicable) 12. ☐ Information Disclosure Statement (PTO/SB/08 or PTO-1449) ☐ Copies of foreign patent documents, publications, & other information 13. ☐ Preliminary Amendment 14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized) 15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) 16. ☐ Nonpublication Request under 35 U.S.C.122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent. 17. ☐ Other:
---	--

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Prior application information: Examiner _____ Art Unit: _____

19. CORRESPONDENCE ADDRESS

☒ The address associated with Customer Number: 25226 OR ☐ Correspondence address below

Name			
Address			
City	State	Zip Code	
Country	Telephone	Email Address	

Signature		Date	November 17, 2005
Name (Print/Type)	Rick Shoop	Registration No. (Attorney/Agent)	45,763

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail, Airbill No. EV 595535421 US, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Dated: November 17, 2005 Signature: (Georgina Matos)

pa-1026284

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<i>Effective on 12/08/2004.</i> <i>Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).</i> FEE TRANSMITTAL For FY 2005		Complete if Known <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Application Number</td><td>Not Yet Assigned</td></tr> <tr><td>Filing Date</td><td>Concurrently Herewith</td></tr> <tr><td>First Named Inventor</td><td>Martin KOEBLER</td></tr> <tr><td>Examiner Name</td><td>Not Yet Assigned</td></tr> <tr><td>Art Unit</td><td>Not Yet Assigned</td></tr> <tr><td>Attorney Docket No.</td><td>601392000100</td></tr> </table>		Application Number	Not Yet Assigned	Filing Date	Concurrently Herewith	First Named Inventor	Martin KOEBLER	Examiner Name	Not Yet Assigned	Art Unit	Not Yet Assigned	Attorney Docket No.	601392000100
Application Number	Not Yet Assigned														
Filing Date	Concurrently Herewith														
First Named Inventor	Martin KOEBLER														
Examiner Name	Not Yet Assigned														
Art Unit	Not Yet Assigned														
Attorney Docket No.	601392000100														
☒ Applicant claims small entity status. See 37 CFR 1.27															
TOTAL AMOUNT OF PAYMENT (\$) 590.00															

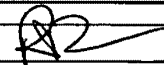
METHOD OF PAYMENT (check all that apply)	
☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____	
☒ Deposit Account Deposit Account Number: <u>03-1952</u> Deposit Account Name: <u>Morrison & Foerster LLP</u>	
For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)	
☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee	
☒ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments	

FEE CALCULATION								
1. BASIC FILING, SEARCH, AND EXAMINATION FEES								
Application Type	Fee (\$)	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
		Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	
Utility	300	150	500	250	200	100		500.00
Design	200	100	100	50	130	65		0.00
Plant	200	100	300	150	160	80		0.00
Reissue	300	150	500	250	600	300		0.00
Provisional	200	100	0	0	0	0		0.00

2. EXCESS CLAIM FEES					
Fee Description	Fee (\$)	Small Entity Fee (\$)			
Each claim over 20 (including Reissues)	50	25			
Each independent claim over 3 (including Reissues)	200	100			
Multiple dependent claims	360	180			
<table style="width: 100%;"> <tr> <td style="width: 33%;"> Total Claims <u>22</u> - 20 = <u>2</u> x <u>25.00</u> = <u>50.00</u> </td> <td style="width: 33%;"> Multiple Dependent Claims Fee (\$) <u>180.00</u> Fee Paid (\$) <u>0.00</u> </td> <td style="width: 33%;"></td> </tr> </table>			Total Claims <u>22</u> - 20 = <u>2</u> x <u>25.00</u> = <u>50.00</u>	Multiple Dependent Claims Fee (\$) <u>180.00</u> Fee Paid (\$) <u>0.00</u>	
Total Claims <u>22</u> - 20 = <u>2</u> x <u>25.00</u> = <u>50.00</u>	Multiple Dependent Claims Fee (\$) <u>180.00</u> Fee Paid (\$) <u>0.00</u>				
<table style="width: 100%;"> <tr> <td style="width: 33%;"> Indep. Claims <u>3</u> - 3 = <u>0</u> x <u>100.00</u> = <u>0.00</u> </td> <td style="width: 33%;"></td> <td style="width: 33%;"></td> </tr> </table>			Indep. Claims <u>3</u> - 3 = <u>0</u> x <u>100.00</u> = <u>0.00</u>		
Indep. Claims <u>3</u> - 3 = <u>0</u> x <u>100.00</u> = <u>0.00</u>					

3. APPLICATION SIZE FEE				
If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 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).				
Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
<u>60</u>	- 100 = <u>0</u>	/50 <u>0</u> (round up to a whole number) x	<u>125.00</u>	= <u>0.00</u>

4. OTHER FEE(S)	
Non-English Specification, \$130 fee (no small entity discount)	
Other (e.g., late filing surcharge): <u>8021 Recording each patent assignment, agreement or ...</u>	<u>40.00</u>

SUBMITTED BY			
Signature		Registration No. (Attorney/Agent)	45,763
Name (Print/Type)	Rick Shoop	Telephone	(650) 813-5804
		Date	November 17, 2005