Related U.S. Application Data

continuation of application No. 13/290,914, filed on Nov. 7, 2011, now Pat. No. 8,296,003, which is a continuation of application No. 12/605,226, filed on Oct. 23, 2009, now Pat. No. 8,055,399.

(60) Provisional application No. 61/107,987, filed on Oct. 23, 2008, provisional application No. 61/155,749, filed on Feb. 26, 2009.

(51) **Int. Cl.**

A01D 34/00	(2006.01)
B60K 7/00	(2006.01)
B60L 1/00	(2006.01)
B60L 15/02	(2006.01)
B60K 26/00	(2006.01)
B60L 15/00	(2006.01)
H02P 3/18	(2006.01)
B60K 1/04	(2006.01)

(52) **U.S. Cl.**

CPC *B60Y2200/223* (2013.01); *Y02T 10/643* (2013.01); *Y02T 10/7258* (2013.01)

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,542,251	A	8/1996	Leibing et al.	
5,588,498	A	12/1996	Kitada	
5,667,029	A	9/1997	Urban et al.	
5,794,422	A	8/1998	Reimers et al.	
5,934,051	A	8/1999	Hahn	
6,038,500	A	3/2000	Weiss	
6,082,084	A	7/2000	Reimers et al.	
6,109,009	A	8/2000	Benson	
6,123,163	A	9/2000	Otsu et al.	
6,242,873	B1	6/2001	Drozdz et al.	
6,522,960	B2	2/2003	Nada	
6,523,334	B1	2/2003	Dettmann	
6,591,593	B1	7/2003	Brandon et al.	
6,609,357	B1	8/2003	Davis et al.	
6,864,646	B2	3/2005	Rahman et al.	
6,995,537	B1	2/2006	Plutowski et al.	
7,007,446	B2	3/2006	Dettmann	
7,017,327	B2	3/2006	Hunt et al.	
7,126,237	B2	10/2006	Walters et al.	
7,367,173	B2	5/2008	Daly et al.	
7,532,968	B2	5/2009	Kadota	
7,690,458	B2	4/2010	Ueda	
7,801,653	B2	9/2010	Sheidler et al.	
7,832,513	B2	11/2010	Verbrugge et al.	
7,855,901	B2	12/2010	Oyobe et al.	
7,946,365	B2	5/2011	Aoyagi et al.	
7,973,499	B2	7/2011	Yoshioka	
8,055,399	B2	11/2011	Wyatt et al.	
2003/0081632	A1	5/2003	Kielhofer et al.	
2004/0000130	A1*	1/2004	Bartel	A01D 34/69 56/11.3
2004/0124026	A1	7/2004	Walters et al.	
2004/0160201	A1	8/2004	Rahman et al.	
2006/0059879	A1	3/2006	Edmond	
2007/0132415	A1	6/2007	Patel et al.	
2007/0145918	A1	6/2007	Kumar et al.	
2008/0234096	A1	9/2008	Joshi et al.	
2008/0289309	A1	11/2008	Gust et al.	
2009/0000839	A1	1/2009	Ishii et al.	
2009/0065273	A1	3/2009	Wyatt et al.	
2009/0069964	A1	3/2009	Wyatt et al.	
2009/0201650	A1	8/2009	Hauser et al.	

FOREIGN PATENT DOCUMENTS

EP	0151208	A1	8/1985
EP	1151892	A2	11/2001
EP	1228917	A1	8/2002
EP	1327547	A2	7/2003
EP	1645456	A2	4/2006
JP	2001320807	A	11/2001
JP	03291692	A	10/2003
JP	2004100718	A	4/2004
JP	2007037366	A	2/2007
JP	2007236016	A	9/2007
WO	2006039520	A1	4/2006
WO	2006039521	A1	4/2006
WO	2009036208	A1	3/2009
WO	2009036211	A2	3/2009
WO	2010048561	A2	4/2010

OTHER PUBLICATIONS

"International Search Report and Written Opinion of the International Searching Authority issued on Mar. 12, 2008 with regard to PCT/US08/076069".

"International Search Report and Written Opinion of the International Searching Authority issued on Mar. 20, 2009 with regard to PCT/US08/076072".

"DC 12-24V 30A Three Phase Power Hardware for Either PMSM or AC Induction Machines; Literature No. BPRA071; Texas Instruments Europe, Dec. 1997; pp. 1-13".

"Edmond Electric Company Ltd.; Patent Pending, Tetsted and Proven Design Apr. 25, 2007; http://electricalwntractor.com".

"Implementation of a Speed Field Oriented Control of 3-Phase PMSM Motor Using TMS320F240; Application Report SPRA 588; Texas Instruments, Inc.; pp. 26-32; date unknown".

"Institute En Genie De L'Energie Electrique; Power Electronic System (IGEE 401) Week 8 Switch-Mode dc-ac Converters (Chapter 8), Images 1-24, pp. 1-12; author, date, publisher unknown".

"Jacobsen, A Textron Comapny; Jacobsen E-PLex II, Riding Greens Mower; pp. 1-2; Version 3.0; Jan. 2007.".

"Jacobsen, A Textron Company; Jacobsen E-Walk, Green Mowers, p. 1-2; Version 3.0 Jan. 2007".

"Jacobsen, A Textron Company; The Toro Comapny, Mid-Duty Specifications: Electric e2065 Workman; Toro-Golf Course Managemt Workman, Apr. 24, 2007; http://www.toro.com.".

"Notification of Transmittal of International Search Report and the Written Opinion of the International Searching Authority or the Declaration of PCT/US2009/061919 dated Jun. 4, 2009".

"Ohm, Dal Y. and Oleksuk, Richard J.; Influence of PWM Schemes and Commutation Methods for DC and Brushless Motors and Drives; pp. 1-12; Presented as P.E. Technology 1002C.".

"Tractors: Specifications; Electric Lawn Tractors and Conversion Kits; Nov. 19, 2006; http://electricalawntractor.com".

"Van-Tung Phan, Hong-Hee-Lee, "Dual Three-Phase Inverter Using a Single Processor to Drive Two Motors in Electric Vehicle Apploications=", Digital Object Identifier: 10.1109/IFOST.2006.312237, Publication Year: 2006, p. 24-28".

"Williamson, S Lukic, M., Emadi, A, Compehensive drive train efficiency analysis of hybrid elctric and fuel cell vehicles based on motor-controller efficiency modeling:, Power Electronics, IEEE Transactions on vol. 21, Issue 3, Digital Object Identifier: 10.1109/TPEL.2006872388, Publication Year: 2006, pp. 730-740".

"Zambada, Jorge; Sensorless Field Oriented Control of PMSM Motors; Microchip AN1078; Microchip Technology Inc., 2007; pp. 1-30".

Extended Search Report for European Patent Application No. 09822810.9 dated Jun. 19, 2015 (8 pp.).

* cited by examiner