



(12) **United States Patent**
Vorbach et al.

(10) **Patent No.:** **US 8,471,593 B2**
(45) **Date of Patent:** **Jun. 25, 2013**

(54) **LOGIC CELL ARRAY AND BUS SYSTEM**

(76) Inventors: **Martin Vorbach**, München (DE); **Frank May**, München (DE); **Dirk Reichardt**, München (DE); **Frank Lier**, München (DE); **Gerd Ehlers**, Grasbrunn (DE); **Armin Nüchel**, Neupotz (DE); **Volker Baumgarte**, München (DE); **Prashant Rao**, München (DE); **Jens Oertel**, Bad Bergzabern (DE)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **13/289,296**

(22) Filed: **Nov. 4, 2011**

(65) **Prior Publication Data**

US 2012/0072699 A1 Mar. 22, 2012

Related U.S. Application Data

(63) Continuation of application No. 12/371,040, filed on Feb. 13, 2009, now Pat. No. 8,058,899, which is a continuation of application No. 10/398,546, filed as application No. PCT/EP01/11593 on Oct. 8, 2001, now Pat. No. 7,595,659.

(51) **Int. Cl.**
G06F 7/52 (2006.01)

(52) **U.S. Cl.**
USPC **326/41; 326/38; 326/39; 708/620; 708/501**

(58) **Field of Classification Search**
USPC **326/38-41; 708/490, 501-505, 620, 708/650, 670**
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS		
3,564,506	A	2/1971 Bee et al.
3,681,578	A	8/1972 Stevens
3,753,008	A	8/1973 Guarnaschelli
3,754,211	A	8/1973 Rocher et al.
3,855,577	A	12/1974 Vandierendonck
3,956,589	A	5/1976 Weathers et al.
3,970,993	A	7/1976 Finnila
4,151,611	A	4/1979 Sugawara et al.
4,233,667	A	11/1980 Devine et al.
4,414,547	A	11/1983 Knapp et al.

(Continued)

FOREIGN PATENT DOCUMENTS

DE	42 21 278	1/1994
DE	44 16 881	11/1994

(Continued)

OTHER PUBLICATIONS

U.S. Reexamination Application Control No. 90/010,979, Vorbach et al., filed May 4, 2010.

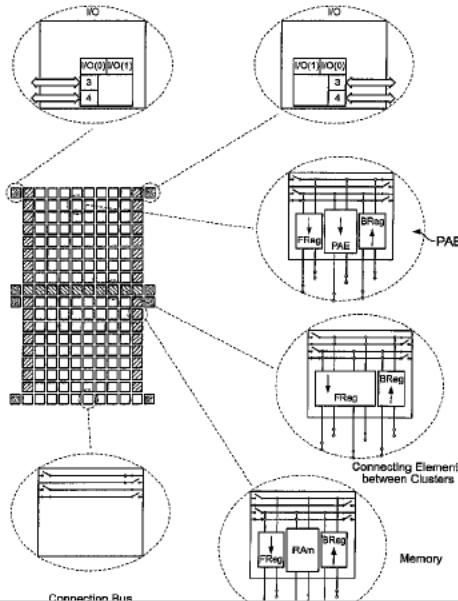
(Continued)

Primary Examiner — Vibol Tan
(74) *Attorney, Agent, or Firm* — Bechen PLLC

(57) **ABSTRACT**

A logic cell array having a number of logic cells and a segmented bus system for logic cell communication, the bus system including different segment lines having shorter and longer segments for connecting two points in order to be able to minimize the number of bus elements traversed between separate communication start and end points.

30 Claims, 11 Drawing Sheets



U.S. PATENT DOCUMENTS			RE34,444 E		
4,498,134	A	2/1985 Hansen et al.	5,274,593	A	11/1993 Kaplinsky
4,498,172	A	2/1985 Bhavsar	5,276,836	A	12/1993 Proebsting
4,566,102	A	1/1986 Hefner	5,287,472	A	1/1994 Fukumaru et al.
4,571,736	A	2/1986 Agrawal et al.	5,287,511	A	2/1994 Horst
4,590,583	A	5/1986 Miller	5,287,532	A	2/1994 Robinson et al.
4,591,979	A	5/1986 Iwashita	5,301,284	A	2/1994 Hunt
4,594,682	A	6/1986 Drimak	5,301,344	A	4/1994 Estes et al.
4,623,997	A	11/1986 Tulpule	5,303,172	A	4/1994 Kolchinsky
4,646,300	A	2/1987 Goodman et al.	5,311,079	A	4/1994 Magar et al.
4,663,706	A	5/1987 Allen et al.	5,327,125	A	5/1994 Ditlow et al.
4,667,190	A	5/1987 Fant et al.	5,336,950	A	7/1994 Iwase et al.
4,682,284	A	7/1987 Schrofer	5,343,406	A	8/1994 Popli et al.
4,686,386	A	8/1987 Tadao	5,347,639	A	8/1994 Freeman et al.
4,706,216	A	11/1987 Carter	5,349,193	A	9/1994 Rechtschaffen et al.
4,720,778	A	1/1988 Hall et al.	5,353,432	A	9/1994 Mott et al.
4,720,780	A	1/1988 Dolecek	5,355,508	A	10/1994 Richek et al.
4,739,474	A	4/1988 Holsztynski	5,361,373	A	10/1994 Kan
4,760,525	A	7/1988 Webb	5,365,125	A	11/1994 Gilson
4,761,755	A	8/1988 Ardini et al.	5,379,444	A	11/1994 Goetting et al.
4,791,603	A	12/1988 Henry	5,379,444	A	1/1995 Mumme
4,811,214	A	3/1989 Nosenchuck et al.	5,386,154	A	1/1995 Goetting et al.
4,852,043	A	7/1989 Guest	5,386,518	A	1/1995 Reagle et al.
4,852,048	A	7/1989 Morton	5,392,437	A	2/1995 Matter et al.
4,860,201	A	8/1989 Stolfo et al.	5,408,643	A	4/1995 Katayose
4,870,302	A	9/1989 Freeman	5,410,723	A	4/1995 Schmidt et al.
4,873,666	A	10/1989 Lefebvre et al.	5,412,795	A	5/1995 Larson
4,882,687	A	11/1989 Gordon	5,418,952	A	5/1995 Morley et al.
4,884,231	A	11/1989 Mor et al.	5,418,953	A	5/1995 Hunt et al.
4,891,810	A	1/1990 de Corlieu et al.	5,421,019	A	5/1995 Holsztynski et al.
4,901,268	A	2/1990 Judd	5,422,823	A	6/1995 Agrawal et al.
4,910,665	A	3/1990 Matheyses et al.	5,425,036	A	6/1995 Liu et al.
4,918,440	A	4/1990 Furtek et al.	5,426,378	A	6/1995 Ong
4,939,641	A	7/1990 Schwartz et al.	5,428,526	A	6/1995 Flood et al.
4,959,781	A	9/1990 Rubinstein et al.	5,430,687	A	6/1995 Hung et al.
4,967,340	A	10/1990 Dawes	5,435,000	A	7/1995 Boothroyd et al.
4,972,314	A	11/1990 Getzinger et al.	5,440,245	A	8/1995 Galbraith et al.
4,992,933	A	2/1991 Taylor	5,440,538	A	8/1995 Olsen et al.
5,010,401	A	4/1991 Murakami et al.	5,442,790	A	8/1995 Nosenchuck
5,014,193	A	5/1991 Garner et al.	5,444,394	A	8/1995 Watson et al.
5,015,884	A	5/1991 Agrawal et al.	5,448,186	A	9/1995 Kawata
5,021,947	A	6/1991 Campbell et al.	5,450,022	A	9/1995 New
5,023,775	A	6/1991 Poret	5,455,525	A	10/1995 Ho et al.
5,031,179	A	7/1991 Yoshida et al.	5,457,644	A	10/1995 McCollum
5,034,914	A	7/1991 Osterlund	5,465,375	A	11/1995 Thepaut et al.
5,036,473	A	7/1991 Butts et al.	5,469,003	A	11/1995 Kean
5,036,493	A	7/1991 Nielsen	5,473,266	A	12/1995 Ahanin et al.
5,041,924	A	8/1991 Blackborow et al.	5,473,267	A	12/1995 Stansfield
5,043,978	A	8/1991 Nagler et al.	5,475,583	A	12/1995 Bock et al.
5,047,924	A	9/1991 Fujioka et al.	5,475,803	A	12/1995 Stearns et al.
5,055,997	A	10/1991 Sluijter et al.	5,475,856	A	12/1995 Kogge
5,065,308	A	11/1991 Evans	5,477,525	A	12/1995 Okabe
5,072,178	A	12/1991 Matsumoto	5,483,620	A	1/1996 Pechanek et al.
5,076,482	A	12/1991 Kozyrski et al.	5,485,103	A	1/1996 Pedersen et al.
5,081,375	A	1/1992 Pickett et al.	5,485,104	A	1/1996 Agrawal et al.
5,099,447	A	3/1992 Myszewski	5,489,857	A	2/1996 Agrawal et al.
5,103,311	A	4/1992 Sluijter et al.	5,491,353	A	2/1996 Kean
5,109,503	A	4/1992 Cruickshank et al.	5,493,239	A	2/1996 Zlotnick
5,113,498	A	5/1992 Evan et al.	5,493,663	A	2/1996 Parikh
5,115,510	A	5/1992 Okamoto et al.	5,497,498	A	3/1996 Taylor
5,119,290	A	6/1992 Loo et al.	5,502,838	A	3/1996 Kikinis
5,123,109	A	6/1992 Hillis	5,504,439	A	4/1996 Tavana
5,128,559	A	7/1992 Steele	5,506,998	A	4/1996 Kato et al.
5,142,469	A	8/1992 Weisenborn	5,510,730	A	4/1996 El Gamal et al.
5,144,166	A	9/1992 Camarota et al.	5,511,173	A	4/1996 Yamaura et al.
5,193,202	A	3/1993 Jackson et al.	5,513,366	A	4/1996 Agarwal et al.
5,203,005	A	4/1993 Horst	5,521,837	A	5/1996 Frankle et al.
5,204,935	A	4/1993 Mihara et al.	5,522,083	A	5/1996 Gove et al.
5,208,491	A	5/1993 Ebeling et al.	5,525,971	A	6/1996 Flynn
5,212,716	A	5/1993 Ferraiolo et al.	5,530,873	A	6/1996 Takano
5,212,777	A	5/1993 Gove et al.	5,530,946	A	6/1996 Bouvier et al.
5,218,302	A	6/1993 Loewe et al.	5,532,693	A	7/1996 Winters et al.
5,226,122	A	7/1993 Thayer et al.	5,532,957	A	7/1996 Malhi
RE34,363	E	8/1993 Freeman	5,535,406	A	7/1996 Kolchinsky
5,233,539	A	8/1993 Agrawal et al.	5,537,057	A	7/1996 Leong et al.
5,237,686	A	8/1993 Asano et al.	5,537,580	A	7/1996 Giomi et al.
5,243,238	A	9/1993 Kean	5,537,601	A	7/1996 Kimura et al.
			5,541,530	A	7/1996 Cliff et al.

5,550,782	A	8/1996	Cliff et al.	5,754,871	A	5/1998	Wilkinson et al.
5,555,434	A	9/1996	Carlstedt	5,760,602	A	6/1998	Tan
5,559,450	A	9/1996	Ngai et al.	5,761,484	A	6/1998	Agarwal et al.
5,561,738	A	10/1996	Kinerk et al.	5,773,994	A	6/1998	Jones
5,568,624	A	10/1996	Sites et al.	5,774,704	A	6/1998	Williams
5,570,040	A	10/1996	Lytle et al.	5,778,237	A	7/1998	Yamamoto et al.
5,572,710	A	11/1996	Asano et al.	5,778,439	A	7/1998	Trimberger et al.
5,574,927	A	11/1996	Scantlin	5,781,756	A	7/1998	Hung
5,574,930	A	11/1996	Halverson, Jr. et al.	5,784,313	A	7/1998	Trimberger et al.
5,581,731	A	12/1996	King et al.	5,784,630	A	7/1998	Saito et al.
5,581,734	A	12/1996	DiBrino et al.	5,784,636	A	7/1998	Rupp
5,583,450	A	12/1996	Trimberger et al.	5,794,059	A	8/1998	Barker et al.
5,584,013	A	12/1996	Cheong et al.	5,794,062	A	8/1998	Baxter
5,586,044	A	12/1996	Agrawal et al.	5,801,547	A	9/1998	Kean
5,587,921	A	12/1996	Agrawal et al.	5,801,715	A	9/1998	Norman
5,588,152	A	12/1996	Dapp et al.	5,801,958	A	9/1998	Dangelo et al.
5,590,345	A	12/1996	Barker et al.	5,802,290	A	9/1998	Casselmann
5,590,348	A	12/1996	Phillips et al.	5,804,986	A	9/1998	Jones
5,596,742	A	1/1997	Agarwal et al.	5,815,004	A	9/1998	Trimberger et al.
5,600,265	A	2/1997	El Gamal et al.	5,815,715	A	9/1998	Ku.cedilla.uk.cedilla.akar
5,600,597	A	2/1997	Kean et al.	5,815,726	A	9/1998	Cliff
5,600,845	A	2/1997	Gilson	5,821,774	A	10/1998	Veytsman et al.
5,603,005	A	2/1997	Bauman et al.	5,828,229	A	10/1998	Cliff et al.
5,606,698	A	2/1997	Powell	5,828,858	A	10/1998	Athanas et al.
5,608,342	A	3/1997	Trimberger	5,831,448	A	11/1998	Kean
5,611,049	A	3/1997	Pitts	5,832,288	A	11/1998	Wong
5,617,547	A	4/1997	Feeney et al.	5,838,165	A	11/1998	Chatter
5,617,577	A	4/1997	Barker et al.	5,838,988	A	11/1998	Panwar et al.
5,619,720	A	4/1997	Garde et al.	5,841,973	A	11/1998	Kessler et al.
5,625,806	A	4/1997	Kromer	5,844,422	A	12/1998	Trimberger et al.
5,625,836	A	4/1997	Barker et al.	5,844,888	A	12/1998	Markkula, Jr. et al.
5,627,992	A	5/1997	Baror	5,848,238	A	12/1998	Shimomura et al.
5,632,029	A	5/1997	Bruce et al.	5,854,918	A	12/1998	Baxter
5,634,131	A	5/1997	Matter et al.	5,857,097	A	1/1999	Henzinger et al.
5,635,851	A	6/1997	Tavana	5,857,109	A	1/1999	Taylor
5,642,058	A	6/1997	Trimberger et al.	5,859,544	A	1/1999	Norman
5,646,544	A	7/1997	Iadanza	5,860,119	A	1/1999	Dockser
5,646,545	A	7/1997	Trimberger et al.	5,862,403	A	1/1999	Kanai et al.
5,649,176	A	7/1997	Selvidge et al.	5,867,691	A	2/1999	Shiraishi
5,649,179	A	7/1997	Steenstra et al.	5,867,723	A	2/1999	Chin et al.
5,652,529	A	7/1997	Gould et al.	5,870,620	A	2/1999	Kadosumi et al.
5,652,894	A	7/1997	Hu et al.	5,884,075	A	3/1999	Hester et al.
5,655,069	A	8/1997	Ogawara et al.	5,887,162	A	3/1999	Williams et al.
5,655,124	A	8/1997	Lin	5,887,165	A	3/1999	Martel et al.
5,656,950	A	8/1997	Duong et al.	5,889,533	A	3/1999	Lee
5,657,330	A	8/1997	Matsumoto	5,889,982	A	3/1999	Rodgers et al.
5,659,785	A	8/1997	Pechanek et al.	5,892,370	A	4/1999	Eaton et al.
5,659,797	A	8/1997	Zandveld et al.	5,892,961	A	4/1999	Trimberger
5,675,262	A	10/1997	Doung et al.	5,892,962	A	4/1999	Cloutier
5,675,743	A	10/1997	Mavity	5,894,565	A	4/1999	Furtek et al.
5,675,757	A	10/1997	Davidson et al.	5,895,487	A	4/1999	Boyd et al.
5,675,777	A	10/1997	Glickman	5,898,602	A	4/1999	Rothman et al.
5,677,909	A	10/1997	Heide	5,901,279	A	5/1999	Davis, III
5,680,583	A	10/1997	Kuijsten	5,913,925	A	6/1999	Kahle et al.
5,682,491	A	10/1997	Pechanek et al.	5,915,099	A	6/1999	Takata et al.
5,682,544	A	10/1997	Pechanek et al.	5,915,123	A	6/1999	Mirsky et al.
5,687,325	A	11/1997	Chang	5,924,119	A	7/1999	Sindhu et al.
5,694,602	A	12/1997	Smith	5,926,638	A	7/1999	Inoue
5,696,791	A	12/1997	Yeung	5,933,023	A	8/1999	Young
5,696,976	A	12/1997	Nizar et al.	5,933,642	A	8/1999	Greenbaum et al.
5,701,091	A	12/1997	Kean	5,936,424	A	8/1999	Young et al.
5,705,938	A	1/1998	Kean	5,943,242	A	8/1999	Vorbach et al.
5,706,482	A	1/1998	Matsushima et al.	5,956,518	A	9/1999	DeHon et al.
5,713,037	A	1/1998	Wilkinson et al.	5,960,193	A	9/1999	Gutttag et al.
5,717,890	A	2/1998	Ichida et al.	5,960,200	A	9/1999	Eager et al.
5,717,943	A	2/1998	Barker et al.	5,966,143	A	10/1999	Breternitz, Jr.
5,732,209	A	3/1998	Vigil et al.	5,966,534	A	10/1999	Cooke et al.
5,734,869	A	3/1998	Chen	5,970,254	A	10/1999	Cooke et al.
5,734,921	A	3/1998	Dapp et al.	5,978,260	A	11/1999	Trimberger et al.
5,737,516	A	4/1998	Circello et al.	5,978,583	A	11/1999	Ekanadham et al.
5,737,565	A	4/1998	Mayfield	5,996,048	A	11/1999	Cherabuddi et al.
5,742,180	A	4/1998	DeHon et al.	5,996,083	A	11/1999	Gupta et al.
5,745,734	A	4/1998	Craft et al.	5,999,990	A	12/1999	Sharrit et al.
5,748,872	A	5/1998	Norman	6,003,143	A	12/1999	Kim et al.
5,748,979	A	5/1998	Trimberger	6,011,407	A	1/2000	New
5,752,035	A	5/1998	Trimberger	6,014,509	A	1/2000	Furtek et al.
5,754,459	A	5/1998	Telikepalli	6,020,758	A	2/2000	Patel et al.

6,023,564	A	2/2000	Trimberger	6,256,724	B1	7/2001	Hocevar et al.
6,023,742	A	2/2000	Ebeling et al.	6,260,114	B1	7/2001	Schug
6,026,481	A	2/2000	New et al.	6,260,179	B1	7/2001	Ohsawa et al.
6,034,538	A	3/2000	Abramovici	6,262,908	B1	7/2001	Marshall et al.
6,035,371	A	3/2000	Magloire	6,263,430	B1	7/2001	Trimberger et al.
6,038,650	A	3/2000	Vorbach et al.	6,266,760	B1	7/2001	DeHon et al.
6,038,656	A	3/2000	Martin et al.	6,279,077	B1	8/2001	Nasserbakht et al.
6,044,030	A	3/2000	Zheng et al.	6,282,627	B1	8/2001	Wong et al.
6,045,585	A	4/2000	Blainey	6,282,701	B1	8/2001	Wygodny et al.
6,047,115	A	4/2000	Mohan et al.	6,285,624	B1	9/2001	Chen
6,049,222	A	4/2000	Lawman	6,286,134	B1	9/2001	Click, Jr. et al.
6,049,866	A	4/2000	Earl	6,288,566	B1	9/2001	Hanrahan et al.
6,052,524	A	4/2000	Pauna	6,289,369	B1	9/2001	Sundaresan
6,052,773	A	4/2000	DeHon et al.	6,289,440	B1	9/2001	Casselman
6,054,873	A	4/2000	Laramie	6,298,043	B1	10/2001	Mauger et al.
6,055,619	A	4/2000	North et al.	6,298,396	B1	10/2001	Loyer et al.
6,058,266	A	5/2000	Megiddo et al.	6,298,472	B1	10/2001	Phillips et al.
6,058,469	A	5/2000	Baxter	6,301,706	B1	10/2001	Maslennikov et al.
6,064,819	A	5/2000	Franssen et al.	6,311,200	B1	10/2001	Hanrahan et al.
6,072,348	A	6/2000	New et al.	6,311,265	B1	10/2001	Beckerle et al.
6,075,935	A	6/2000	Ussery et al.	6,317,819	B1	11/2001	Morton
6,076,157	A	6/2000	Borkenhagen et al.	6,321,298	B1	11/2001	Hubis
6,077,315	A	6/2000	Greenbaum et al.	6,321,366	B1	11/2001	Tseng et al.
6,078,736	A	6/2000	Guccione	6,321,373	B1	11/2001	Ekanadham et al.
6,081,903	A	6/2000	Vorbach et al.	6,338,106	B1	1/2002	Vorbach et al.
6,084,429	A	7/2000	Trimberger	6,339,424	B1	1/2002	Ishikawa et al.
6,085,317	A	7/2000	Smith	6,339,840	B1	1/2002	Kothari et al.
6,086,628	A	7/2000	Dave et al.	6,341,318	B1	1/2002	Dakhil
6,088,795	A	7/2000	Vorbach et al.	6,347,346	B1	2/2002	Taylor
6,092,174	A	7/2000	Roussakov	6,349,346	B1	2/2002	Hanrahan et al.
RE36,839	E	8/2000	Simmons et al.	6,353,841	B1	3/2002	Marshall et al.
6,096,091	A	8/2000	Hartmann	6,362,650	B1	3/2002	New et al.
6,105,105	A	8/2000	Trimberger et al.	6,370,596	B1	4/2002	Dakhil
6,105,106	A	8/2000	Manning	6,373,779	B1	4/2002	Pang et al.
6,108,760	A	8/2000	Mirsky et al.	6,374,286	B1	4/2002	Gee
6,118,724	A	9/2000	Higginbottom	6,378,068	B1	4/2002	Foster et al.
6,119,181	A	9/2000	Vorbach et al.	6,381,624	B1	4/2002	Colon-Bonet et al.
6,122,719	A	9/2000	Mirsky et al.	6,389,379	B1	5/2002	Lin et al.
6,125,072	A	9/2000	Wu	6,389,579	B1	5/2002	Phillips et al.
6,125,408	A	9/2000	McGee et al.	6,392,912	B1	5/2002	Hanrahan et al.
6,127,908	A	10/2000	Bozler et al.	6,400,601	B1	6/2002	Sudo et al.
6,128,720	A	10/2000	Pechanek et al.	6,404,224	B1	6/2002	Azegami et al.
6,134,166	A	10/2000	Lytle et al.	6,405,185	B1	6/2002	Pechanek et al.
6,137,307	A	10/2000	Iwanczuk et al.	6,405,299	B1	6/2002	Vorbach et al.
6,145,072	A	11/2000	Shams et al.	6,421,808	B1	7/2002	McGeer
6,150,837	A	11/2000	Beal et al.	6,421,809	B1	7/2002	Wuytack et al.
6,150,839	A	11/2000	New et al.	6,421,817	B1	7/2002	Mohan et al.
6,154,048	A	11/2000	Iwanczuk et al.	6,425,054	B1	7/2002	Nguyen
6,154,049	A	11/2000	New	6,425,068	B1	7/2002	Vorbach
6,154,826	A	11/2000	Wulf et al.	6,426,649	B1	7/2002	Fu et al.
6,157,214	A	12/2000	Marshall	6,427,156	B1	7/2002	Chapman et al.
6,170,051	B1	1/2001	Dowling	6,430,309	B1	8/2002	Pressman et al.
6,172,520	B1	1/2001	Lawman et al.	6,434,642	B1	8/2002	Camilleri et al.
6,173,419	B1	1/2001	Barnett	6,434,672	B1	8/2002	Gaither
6,173,434	B1	1/2001	Wirthlin et al.	6,434,695	B1	8/2002	Esfahani et al.
6,178,494	B1	1/2001	Casselman	6,434,699	B1*	8/2002	Jones et al. 713/168
6,185,256	B1	2/2001	Saito et al.	6,437,441	B1	8/2002	Yamamoto
6,185,731	B1	2/2001	Maeda et al.	6,438,747	B1	8/2002	Schreiber et al.
6,188,240	B1	2/2001	Nakaya	6,449,283	B1	9/2002	Chao et al.
6,188,650	B1	2/2001	Hamada et al.	6,456,628	B1	9/2002	Greim et al.
6,191,614	B1	2/2001	Schultz et al.	6,457,116	B1	9/2002	Mirsky et al.
6,198,304	B1	3/2001	Sasaki	6,476,634	B1	11/2002	Bilski
6,201,406	B1	3/2001	Iwanczuk et al.	6,477,643	B1	11/2002	Vorbach et al.
6,202,163	B1	3/2001	Gabzdyl et al.	6,480,937	B1	11/2002	Vorbach et al.
6,202,182	B1	3/2001	Abramovici et al.	6,480,954	B2	11/2002	Trimberger et al.
6,204,687	B1	3/2001	Schultz et al.	6,483,343	B1	11/2002	Faith et al.
6,211,697	B1	4/2001	Lien et al.	6,487,709	B1	11/2002	Keller et al.
6,212,544	B1	4/2001	Borkenhagen et al.	6,490,695	B1	12/2002	Zagorski et al.
6,212,650	B1	4/2001	Guccione	6,496,740	B1	12/2002	Robertson et al.
6,215,326	B1	4/2001	Jefferson et al.	6,496,902	B1	12/2002	Faanes et al.
6,216,223	B1	4/2001	Revilla et al.	6,496,971	B1	12/2002	Lesea et al.
6,219,833	B1	4/2001	Solomon et al.	6,504,398	B1	1/2003	Lien et al.
RE37,195	E	5/2001	Kean	6,507,898	B1	1/2003	Gibson et al.
6,230,307	B1	5/2001	Davis et al.	6,507,947	B1	1/2003	Schreiber et al.
6,240,502	B1	5/2001	Panwar et al.	6,512,804	B1	1/2003	Johnson et al.
6,243,808	B1	6/2001	Wang	6,513,077	B2	1/2003	Vorbach et al.
6,247,147	B1	6/2001	Beenstra et al.	6,516,382	B2	2/2003	Manning

6,523,107	B1	2/2003	Stansfield et al.	7,254,649	B2	8/2007	Subramanian et al.
6,525,678	B1	2/2003	Veenstra et al.	7,266,725	B2	9/2007	Vorbach et al.
6,526,520	B1	2/2003	Vorbach et al.	7,340,596	B1	3/2008	Crosland et al.
6,538,468	B1	3/2003	Moore	7,346,644	B1	3/2008	Langhammer et al.
6,538,470	B1	3/2003	Langhammer et al.	7,350,178	B1	3/2008	Crosland et al.
6,539,415	B1	3/2003	Mercs	7,382,156	B2	6/2008	Pani et al.
6,539,438	B1	3/2003	Ledzius et al.	7,455,450	B2	11/2008	Liu et al.
6,539,477	B1	3/2003	Seawright	7,500,043	B2*	3/2009	Wood 710/307
6,542,394	B2	4/2003	Marshall et al.	7,595,659	B2	9/2009	Vorbach et al.
6,542,844	B1	4/2003	Hanna	7,650,448	B2	1/2010	Vorbach et al.
6,542,998	B1	4/2003	Vorbach	7,657,877	B2	2/2010	Vorbach et al.
6,553,395	B2	4/2003	Marshall et al.	7,759,968	B1	7/2010	Hussein et al.
6,553,479	B2	4/2003	Mirsky et al.	7,873,811	B1	1/2011	Wolinski et al.
6,567,834	B1	5/2003	Marshall et al.	8,305,835	B2*	11/2012	Schreiber et al. 365/230.06
6,571,381	B1	5/2003	Vorbach et al.	2001/0001860	A1	5/2001	Bieu
6,587,939	B1	7/2003	Takano	2001/0003834	A1	6/2001	Shimonishi
6,598,128	B1	7/2003	Yoshioka et al.	2001/0010074	A1	7/2001	Nishihara et al.
6,606,704	B1	8/2003	Adiletta et al.	2001/0018733	A1	8/2001	Fujii et al.
6,624,819	B1	9/2003	Lewis	2001/0032305	A1	10/2001	Barry
6,625,631	B2	9/2003	Ruehle	2002/0004916	A1	1/2002	Marchand et al.
6,631,487	B1	10/2003	Abramovici et al.	2002/0010853	A1	1/2002	Trimberger et al.
6,633,181	B1	10/2003	Rupp	2002/0013861	A1	1/2002	Adiletta et al.
6,657,457	B1	12/2003	Hanrahan et al.	2002/0038414	A1	3/2002	Taylor
6,658,564	B1	12/2003	Smith et al.	2002/0045952	A1	4/2002	Blemel
6,665,758	B1	12/2003	Frazier et al.	2002/0051482	A1	5/2002	Lomp
6,668,237	B1	12/2003	Guccione et al.	2002/0073282	A1	6/2002	Chauvel et al.
6,681,388	B1	1/2004	Sato et al.	2002/0083308	A1	6/2002	De Oliveira Kastrup Pereira et al.
6,687,788	B2	2/2004	Vorbach et al.	2002/0099759	A1	7/2002	Gootherts
6,694,434	B1	2/2004	McGee et al.	2002/0103839	A1	8/2002	Ozawa
6,697,979	B1	2/2004	Vorbach et al.	2002/0124238	A1	9/2002	Metzgen
6,704,816	B1	3/2004	Burke	2002/0138716	A1	9/2002	Master et al.
6,708,223	B1	3/2004	Wang et al.	2002/0143505	A1	10/2002	Drusinsky
6,708,325	B2	3/2004	Cooke et al.	2002/0144229	A1	10/2002	Hanrahan
6,717,436	B2	4/2004	Kress et al.	2002/0147932	A1	10/2002	Brock et al.
6,721,830	B2	4/2004	Vorbach et al.	2002/0152060	A1	10/2002	Tseng
6,721,884	B1	4/2004	De Oliveira Kastrup Pereira et al.	2002/0156962	A1	10/2002	Chopra et al.
6,725,334	B2	4/2004	Barroso et al.	2002/0162097	A1	10/2002	Meribout
6,728,871	B1	4/2004	Vorbach et al.	2002/0165886	A1	11/2002	Lam
6,745,317	B1	6/2004	Mirsky et al.	2003/0001615	A1	1/2003	Sueyoshi et al.
6,748,440	B1	6/2004	Lisitsa et al.	2003/0014743	A1	1/2003	Cooke et al.
6,751,722	B2	6/2004	Mirsky et al.	2003/0046607	A1	3/2003	May et al.
6,754,805	B1	6/2004	Juan	2003/0052711	A1	3/2003	Taylor
6,757,847	B1	6/2004	Farkash et al.	2003/0055861	A1	3/2003	Lai et al.
6,757,892	B1	6/2004	Gokhale et al.	2003/0056062	A1	3/2003	Prabhu
6,782,445	B1	8/2004	Olgiati et al.	2003/0056085	A1	3/2003	Vorbach
6,785,826	B1	8/2004	Durham et al.	2003/0056091	A1	3/2003	Greenberg
6,802,026	B1	10/2004	Patterson et al.	2003/0056202	A1	3/2003	May et al.
6,803,787	B1	10/2004	Wicker, Jr.	2003/0061542	A1	3/2003	Bates et al.
6,820,188	B2	11/2004	Stansfield et al.	2003/0062922	A1	4/2003	Douglass et al.
6,829,697	B1	12/2004	Davis et al.	2003/0070059	A1	4/2003	Dally et al.
6,836,842	B1	12/2004	Guccione et al.	2003/0086300	A1	5/2003	Noyes et al.
6,847,370	B2	1/2005	Baldwin et al.	2003/0093662	A1	5/2003	Vorbach et al.
6,859,869	B1	2/2005	Vorbach	2003/0097513	A1	5/2003	Vorbach et al.
6,868,476	B2	3/2005	Rosenbluth	2003/0123579	A1	7/2003	Safavi et al.
6,871,341	B1	3/2005	Shyr	2003/0135686	A1	7/2003	Vorbach et al.
6,874,108	B1	3/2005	Abramovici et al.	2003/0154349	A1	8/2003	Berg et al.
6,886,092	B1	4/2005	Douglass et al.	2003/0192032	A1	10/2003	Andrade et al.
6,901,502	B2	5/2005	Yano et al.	2003/0226056	A1	12/2003	Yip et al.
6,928,523	B2	8/2005	Yamada	2004/0015899	A1	1/2004	May et al.
6,957,306	B2	10/2005	So et al.	2004/0025005	A1	2/2004	Vorbach et al.
6,961,924	B2	11/2005	Bates et al.	2004/0039880	A1	2/2004	Pentkovski et al.
6,975,138	B2	12/2005	Pani et al.	2004/0078548	A1	4/2004	Claydon et al.
6,977,649	B1	12/2005	Baldwin et al.	2004/0088689	A1	5/2004	Hammes
7,000,161	B1	2/2006	Allen et al.	2004/0088691	A1	5/2004	Hammes et al.
7,007,096	B1	2/2006	Lisitsa et al.	2004/0168099	A1	8/2004	Vorbach et al.
7,010,667	B2	3/2006	Vorbach	2004/0199688	A1	10/2004	Vorbach et al.
7,010,687	B2	3/2006	Ichimura	2005/0066213	A1	3/2005	Vorbach et al.
7,028,107	B2	4/2006	Vorbach et al.	2005/0091468	A1	4/2005	Morita et al.
7,036,114	B2	4/2006	McWilliams et al.	2005/0144210	A1	6/2005	Simkins et al.
7,038,952	B1	5/2006	Zack et al.	2005/0144212	A1	6/2005	Simkins et al.
7,043,416	B1	5/2006	Lin	2005/0144215	A1	6/2005	Simkins et al.
7,144,152	B2	12/2006	Rusu et al.	2006/0036988	A1	2/2006	Allen et al.
7,155,708	B2	12/2006	Hammes et al.	2006/0230094	A1	10/2006	Simkins et al.
7,164,422	B1	1/2007	Wholey et al.	2006/0230096	A1	10/2006	Thendean et al.
7,188,819	B2	3/2007	Thurmann et al.	2007/0050603	A1	3/2007	Vorbach et al.
7,210,129	B2	4/2007	May et al.	2007/0083730	A1	4/2007	Vorbach et al.
7,216,204	B2	5/2007	Rosenbluth				

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.