



US008942107B2

(12) **United States Patent**
Austerman, III et al.

(10) **Patent No.:** **US 8,942,107 B2**
(45) **Date of Patent:** **Jan. 27, 2015**

(54) **PIECE OF ETHERNET TERMINAL EQUIPMENT**

(75) Inventors: **John F. Austerman, III**, Huntington Woods, MI (US); **Marshall B. Cummings**, Troy, MI (US)

(73) Assignee: **ChriMar Systems, Inc.**, Farmington Hills, MI (US)

(*) 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.: **13/370,918**

(22) Filed: **Feb. 10, 2012**

(65) **Prior Publication Data**

US 2012/0250784 A1 Oct. 4, 2012

Related U.S. Application Data

(63) Continuation of application No. 12/239,001, filed on Sep. 26, 2008, now Pat. No. 8,155,012, which is a continuation of application No. 10/668,708, filed on Sep. 23, 2003, now Pat. No. 7,457,250, which is a continuation of application No. 09/370,430, filed on Aug. 9, 1999, now Pat. No. 6,650,622, which is a continuation-in-part of application No. PCT/US99/07846, filed on Apr. 8, 1999.

(60) Provisional application No. 60/081,279, filed on Apr. 10, 1998.

(51) **Int. Cl.**
H04L 12/12 (2006.01)
G08B 13/14 (2006.01)
H04L 1/24 (2006.01)
H04B 3/54 (2006.01)

(52) **U.S. Cl.**
CPC .. **H04L 1/24** (2013.01); **H04B 3/54** (2013.01); **H04B 2203/5445** (2013.01); **H04B 2203/5458** (2013.01); **H04B 2203/5466** (2013.01); **H04B 2203/547** (2013.01); **H04B 2203/5491** (2013.01); **H04B 2203/5495** (2013.01)

USPC **370/241**; 370/463; 340/568.1

(58) **Field of Classification Search**

None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

202,495 A 4/1878 Watson
244,426 A 7/1881 Bell

(Continued)

FOREIGN PATENT DOCUMENTS

CA 2183106 A1 2/1998
CN 2050662 U 1/1990

(Continued)

OTHER PUBLICATIONS

"10BaseT Takes Off" (LAN Magazine, May 1991).

(Continued)

Primary Examiner — Chi H Pham

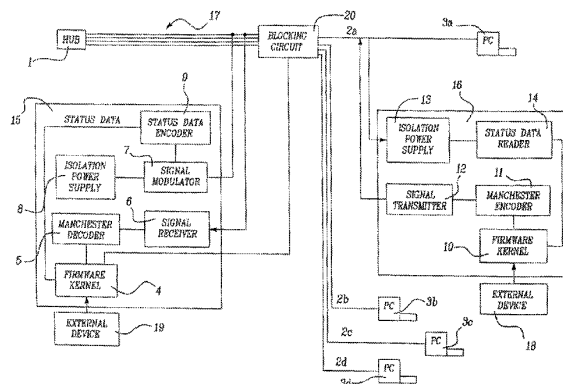
Assistant Examiner — Soon-Dong D Hyun

(74) *Attorney, Agent, or Firm* — Harness, Dickey & Pierce, P.L.C.

(57) **ABSTRACT**

A piece of Ethernet terminal equipment having an Ethernet connector including first and second pairs of contacts used to carry Ethernet communication signals. At least one path for the purpose of drawing DC current. The at least one path coupled across at least one of the contacts of the first pair of contacts and at least one of the contacts of the second pair of contacts. The piece of Ethernet terminal equipment to draw different magnitudes of DC current flow via the at least one path. The different magnitudes of DC current flow to result from at least one condition applied to at least one of the contacts of the first and second pairs of contacts, wherein at least one of the magnitudes of the DC current flow to convey information about the piece of Ethernet terminal equipment.

125 Claims, 13 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

406,567 A	7/1889	Edison	4,397,020 A	8/1983	Howson
2,846,509 A	8/1958	Dubuar	4,398,066 A	8/1983	Sinberg
3,359,379 A	12/1967	Pullum et al.	4,410,982 A	10/1983	Fleischfresser et al.
3,407,400 A	10/1968	Lurie	4,413,250 A	11/1983	Porter et al.
3,408,643 A	10/1968	Sliman	4,438,298 A	3/1984	Rubin
3,423,521 A	1/1969	Friesen et al.	4,446,341 A	5/1984	Rubin
3,425,050 A	1/1969	Tellerman et al.	4,454,477 A	6/1984	Joffe
3,500,132 A	3/1970	Garrett	4,463,352 A	7/1984	Forbes et al.
3,535,472 A	10/1970	Babbitt, III	4,464,658 A	8/1984	Thelen
3,537,095 A	10/1970	Cones	4,467,147 A	8/1984	Rubin
3,593,274 A	7/1971	Krugler, Jr.	4,467,314 A	8/1984	Weikel et al.
3,597,549 A	8/1971	Farmer et al.	4,475,079 A	10/1984	Gale
3,618,065 A	11/1971	Trip et al.	4,479,228 A	10/1984	Crane
3,634,845 A	1/1972	Colman	4,482,999 A	11/1984	Janson et al.
3,659,277 A	4/1972	Brown	4,484,028 A	11/1984	Kelley et al.
3,696,378 A	10/1972	Daniel	4,487,836 A	12/1984	Takayanagi et al.
3,697,984 A	10/1972	Atkinson et al.	4,494,541 A	1/1985	Archibald
3,731,012 A	5/1973	Shaffer	4,495,494 A	1/1985	McCune
3,758,728 A	9/1973	Le Roch et al.	4,507,568 A	3/1985	Ziegler et al.
3,768,084 A	10/1973	Haynes	4,524,349 A	6/1985	Hyatt
3,781,481 A	12/1973	Shaffer et al.	4,525,636 A	6/1985	Kominami et al.
3,794,989 A	2/1974	Manley et al.	4,527,216 A	7/1985	Stammely
3,818,179 A	6/1974	Mase	4,528,667 A	7/1985	Fruhauf
3,828,139 A	8/1974	Chambers, Jr.	4,532,626 A	7/1985	Flores et al.
3,832,521 A	8/1974	Niendorf	4,535,401 A	8/1985	Penn
3,832,678 A	8/1974	Gysell et al.	4,551,671 A	11/1985	Annunziata et al.
3,836,901 A	9/1974	Matto et al.	4,564,726 A	1/1986	Ibata
3,842,218 A	10/1974	DeLuca et al.	4,571,656 A	2/1986	Ruckman
3,848,179 A	11/1974	Kayama	4,575,714 A	3/1986	Rummel
3,863,036 A	1/1975	McCrudden	4,578,539 A	3/1986	Townsing
3,868,484 A	2/1975	Bolton et al.	4,586,104 A	4/1986	Standler
3,886,419 A	5/1975	Omura et al.	4,593,389 A	6/1986	Wurzburg et al.
RE28,692 E	1/1976	Highstone et al.	4,602,364 A	7/1986	Herman et al.
3,932,857 A	1/1976	Way et al.	4,611,101 A	9/1986	Walter et al.
3,969,594 A	7/1976	DeLuca et al.	4,617,656 A	10/1986	Kobayashi et al.
3,983,338 A	9/1976	Mathauser	4,622,541 A	11/1986	Stockdale
4,024,359 A	5/1977	De Marco et al.	4,629,836 A	12/1986	Walsworth
4,024,360 A	5/1977	Biraghi et al.	4,631,367 A	12/1986	Coviello et al.
4,054,760 A	10/1977	Morgen	4,633,217 A	12/1986	Akano
4,063,220 A	12/1977	Metcalfe et al.	4,636,771 A	1/1987	Ochs
4,064,431 A	12/1977	Cote	4,639,714 A	1/1987	Crowe
4,101,878 A	7/1978	Shimizu et al.	4,647,721 A	3/1987	Busam et al.
4,121,201 A	10/1978	Weathers	4,647,912 A	3/1987	Bates et al.
4,128,804 A	12/1978	Russell	4,649,548 A	3/1987	Crane
4,131,767 A	12/1978	Weinstein	4,654,638 A	3/1987	Clift
4,156,799 A	5/1979	Cave	4,654,640 A	3/1987	Carll et al.
4,160,884 A	7/1979	Bishop	4,656,318 A	4/1987	Noyes
4,161,719 A	7/1979	Parikh et al.	4,658,099 A	4/1987	Frazer
4,162,489 A	7/1979	Thilo et al.	4,658,242 A	4/1987	Zeder
4,173,714 A	11/1979	Bloch et al.	4,661,797 A	4/1987	Schmall
4,179,688 A	12/1979	Romney	4,661,979 A	4/1987	Jakab
4,186,339 A	1/1980	Finger	4,670,902 A	6/1987	Naiwirt
4,191,971 A	3/1980	Dischert et al.	4,674,084 A	6/1987	Suzuki et al.
4,230,912 A	10/1980	Lee et al.	4,685,129 A	8/1987	Gavrilovich
4,232,199 A	11/1980	Boatwright et al.	4,686,514 A	8/1987	Liptak, Jr. et al.
4,254,305 A	3/1981	Treiber	4,691,344 A	9/1987	Brown et al.
4,260,882 A	4/1981	Barnes	4,692,761 A	9/1987	Robinton
4,268,723 A	5/1981	Taylor	4,701,630 A	10/1987	Annunziata et al.
4,273,955 A	6/1981	Armstrong	4,701,946 A	10/1987	Oliva et al.
4,277,740 A	7/1981	Parks	4,712,233 A	12/1987	Kuo
4,282,407 A	8/1981	Stiefel	4,717,896 A	1/1988	Graham
4,290,056 A	9/1981	Chow	4,719,616 A	1/1988	Akano
4,292,480 A	9/1981	Sweatt	4,723,267 A	2/1988	Jones et al.
4,293,948 A	10/1981	Soderblom	4,728,948 A	3/1988	Fields
4,303,073 A	12/1981	Archibald	4,729,125 A	3/1988	Sterling, Jr. et al.
4,313,081 A	1/1982	Smith	4,731,810 A	3/1988	Watkins
4,315,107 A	2/1982	Ciesielka et al.	4,731,829 A	3/1988	Bonnet et al.
4,322,677 A	3/1982	Wright	4,733,223 A	3/1988	Gilbert
4,340,788 A	7/1982	Sbuelz	4,733,389 A	3/1988	Puvogel
4,348,661 A	9/1982	Lucchesi	4,736,195 A	4/1988	McMurtry et al.
4,349,703 A	9/1982	Chea, Jr.	4,737,787 A	4/1988	Ito et al.
4,350,849 A	9/1982	Ahuja	4,742,334 A	5/1988	Teich et al.
4,367,455 A	1/1983	Fried	4,751,498 A	6/1988	Shalvi et al.
4,383,315 A	5/1983	Tornng	4,755,792 A	7/1988	Pezzolo et al.
4,388,667 A	6/1983	Saurenman	4,755,922 A	7/1988	Puvogel
			4,758,823 A	7/1988	Berruyer et al.
			4,760,382 A	7/1988	Faulkner
			4,766,386 A	8/1988	Oliver et al.
			4,771,229 A	9/1988	Ziegler

(56)

References Cited

U.S. PATENT DOCUMENTS

4,779,153 A	10/1988	Tsubota	5,093,828 A	3/1992	Braun et al.
4,782,322 A	11/1988	Lechner et al.	RE33,900 E	4/1992	Howson
4,782,355 A	11/1988	Sakai et al.	5,119,398 A	6/1992	Webber, Jr.
4,782,482 A	11/1988	Kiatipov et al.	5,119,402 A	6/1992	Ginzburg et al.
4,785,812 A	11/1988	Pihl et al.	5,121,482 A	6/1992	Patton
4,799,211 A	1/1989	Felker et al.	5,121,500 A	6/1992	Arlington et al.
4,813,066 A	3/1989	Holtz et al.	5,124,982 A	6/1992	Kaku
4,815,106 A	3/1989	Propp et al.	5,131,033 A	7/1992	Reum
4,817,106 A	3/1989	Thompson	5,133,005 A	7/1992	Kelley et al.
4,821,319 A	4/1989	Middleton et al.	5,136,580 A	8/1992	Videloock et al.
4,823,600 A	4/1989	Biegel et al.	5,142,269 A	8/1992	Mueller
4,825,349 A	4/1989	Marcel	5,144,544 A	9/1992	Jenneve et al.
4,839,886 A	6/1989	Wu et al.	5,148,144 A	9/1992	Sutterlin et al.
4,862,158 A	8/1989	Keller et al.	5,164,960 A	11/1992	Wincn et al.
4,864,598 A	9/1989	Lynch et al.	5,168,170 A	12/1992	Hartig
4,866,768 A	9/1989	Sinberg	5,179,291 A	1/1993	Nishikawa et al.
4,875,223 A	10/1989	Curtis	5,179,710 A	1/1993	Coschieri
4,882,728 A	11/1989	Herman	5,181,240 A	1/1993	Sakuragi et al.
4,884,263 A	11/1989	Suzuki	5,189,409 A	2/1993	Okuno
4,884,287 A	11/1989	Jones et al.	5,192,231 A	3/1993	Dolin, Jr.
4,885,563 A	12/1989	Johnson et al.	5,195,183 A	3/1993	Miller et al.
4,896,315 A	1/1990	Felker et al.	5,199,049 A	3/1993	Wilson
4,901,003 A	2/1990	Clegg	5,200,743 A	4/1993	St. Martin et al.
4,901,217 A	2/1990	Wilson	5,200,877 A	4/1993	Betton et al.
4,903,006 A	2/1990	Boomgaard	5,216,704 A	6/1993	Williams et al.
4,907,261 A	3/1990	Chapman	5,222,164 A	6/1993	Bass, Sr. et al.
4,916,621 A	4/1990	Bean et al.	5,223,806 A	6/1993	Curtis et al.
4,918,688 A	4/1990	Krause et al.	5,226,120 A	7/1993	Brown et al.
4,922,503 A	5/1990	Leone	5,231,375 A	7/1993	Sanders et al.
4,926,158 A	5/1990	Zeigler	5,235,599 A	8/1993	Nishimura et al.
4,935,926 A	6/1990	Herman	5,237,606 A	8/1993	Ziermann
4,935,959 A	6/1990	Markovic et al.	5,241,160 A	8/1993	Bashan et al.
4,937,811 A	6/1990	Harris	5,243,328 A	9/1993	Lee et al.
4,937,851 A	6/1990	Lynch et al.	5,249,183 A	9/1993	Wong et al.
4,942,604 A	7/1990	Smith et al.	5,255,962 A	10/1993	Neuhaus et al.
4,951,309 A	8/1990	Gross et al.	5,257,287 A	10/1993	Blumenthal et al.
4,953,055 A	8/1990	Douhet et al.	5,260,664 A	11/1993	Graham
4,958,371 A	9/1990	Damoci et al.	5,264,777 A	11/1993	Smead
4,961,222 A	10/1990	Johansson et al.	5,267,238 A	11/1993	Yano et al.
4,969,179 A	11/1990	Kanare et al.	5,270,896 A	12/1993	McDonald
4,973,954 A	11/1990	Schwarz	5,275,172 A	1/1994	Ives
4,980,913 A	12/1990	Skret	5,278,888 A	1/1994	Myllymaki
4,991,123 A	2/1991	Casamassima	5,280,251 A	1/1994	Strangio
4,992,774 A	2/1991	McCullough	5,285,477 A	2/1994	Leonowich
4,998,275 A	3/1991	Braunstein et al.	5,289,359 A	2/1994	Ziermann
4,998,850 A	3/1991	Crowell	5,289,458 A	2/1994	Taha
5,003,457 A	3/1991	Ikei et al.	5,289,461 A	2/1994	de Nijs
5,003,579 A	3/1991	Jones	5,297,141 A	3/1994	Marum
5,007,858 A	4/1991	Daly et al.	5,301,246 A	4/1994	Archibald et al.
5,020,100 A	5/1991	Gardiner	5,302,889 A	4/1994	Marsh
5,020,773 A	6/1991	Tuft et al.	5,306,956 A	4/1994	Ikeda et al.
5,021,779 A	6/1991	Bisak	5,311,114 A	5/1994	Sambamurthy et al.
5,029,201 A	7/1991	Bindels	5,311,518 A	5/1994	Takato et al.
5,032,819 A	7/1991	Sakuragi et al.	5,313,642 A	5/1994	Seigel
5,032,833 A	7/1991	Laporte	5,315,237 A	5/1994	Iwakura et al.
5,033,112 A	7/1991	Bowling et al.	5,319,363 A	6/1994	Welch et al.
5,034,723 A	7/1991	Maman	5,321,372 A	6/1994	Smith
5,034,738 A	7/1991	Ishihara et al.	5,323,461 A	6/1994	Rosenbaum et al.
5,034,948 A	7/1991	Mizutani et al.	5,333,177 A	7/1994	Braitberg et al.
5,034,978 A	7/1991	Nguyen et al.	5,333,192 A	7/1994	McGinn
5,038,782 A	8/1991	Gevens et al.	5,336,946 A	8/1994	Segaram et al.
5,051,723 A	9/1991	Long et al.	5,345,422 A	9/1994	Redwine
5,055,827 A	10/1991	Philipp	5,345,592 A	9/1994	Woodmas
5,056,131 A	10/1991	Kanare et al.	5,347,225 A	9/1994	Graham
5,059,782 A	10/1991	Fukuyama	5,351,272 A	9/1994	Abraham
5,059,948 A	10/1991	Desmeules	5,353,009 A	10/1994	Marsh et al.
5,063,563 A	11/1991	Ikeda et al.	5,357,145 A	10/1994	Segaram
5,063,585 A	11/1991	Shapiro	5,365,515 A	11/1994	Graham
5,066,939 A	11/1991	Mansfield, Jr.	5,368,041 A	11/1994	Shambroom
5,066,942 A	11/1991	Matsuo	5,379,441 A	1/1995	Watanabe et al.
5,073,919 A	12/1991	Hagensick	5,381,804 A	1/1995	Shambroom
5,076,763 A	12/1991	Anastos et al.	5,384,429 A	1/1995	Bulson et al.
5,077,526 A	12/1991	Vokey et al.	5,389,882 A	2/1995	I'Anson et al.
RE33,807 E	1/1992	Abel et al.	5,391,932 A	2/1995	Small et al.
5,089,974 A	2/1992	Demeyer et al.	5,396,555 A	3/1995	Shibata et al.
			5,406,260 A *	4/1995	Cummings et al. 340/568.2
			5,408,669 A	4/1995	Stewart et al.
			5,414,708 A	5/1995	Webber et al.
			5,414,709 A	5/1995	Baze

(56)

References Cited

U.S. PATENT DOCUMENTS

5,420,572 A	5/1995	Dolin, Jr. et al.	5,652,479 A	7/1997	LoCascio et al.
5,422,519 A	6/1995	Russell	5,652,575 A	7/1997	Pryor et al.
5,424,710 A	6/1995	Baumann	5,652,893 A	7/1997	Ben-Meir et al.
5,432,505 A	7/1995	Wise	5,652,895 A	7/1997	Poisner
5,438,606 A	8/1995	Cerulli	5,655,077 A	8/1997	Jones et al.
5,440,335 A	8/1995	Beveridge	5,659,542 A	8/1997	Bell et al.
5,441,520 A	8/1995	Olsen et al.	5,664,002 A	9/1997	Skinner, Sr.
5,444,184 A	8/1995	Hassel	5,670,937 A	9/1997	Right et al.
5,444,856 A	8/1995	Bowers et al.	5,671,354 A	9/1997	Ito et al.
5,446,914 A	8/1995	Paul et al.	5,675,321 A	10/1997	McBride
5,448,565 A	9/1995	Chang et al.	5,675,371 A	10/1997	Barringer
5,450,486 A	9/1995	Maas et al.	5,675,811 A	10/1997	Broedner et al.
5,451,923 A	9/1995	Seberger et al.	5,675,813 A	10/1997	Holmdahl
5,452,344 A	9/1995	Larson	5,678,547 A	10/1997	Faupel et al.
5,455,467 A	10/1995	Young et al.	5,678,559 A	10/1997	Drakulic
5,457,629 A	10/1995	Miller et al.	5,679,987 A	10/1997	Ogawa
5,459,283 A	10/1995	Birdwell, Jr.	5,684,826 A	11/1997	Ratner
5,461,671 A	10/1995	Sakuragi et al.	5,684,950 A	11/1997	Dare et al.
5,467,061 A	11/1995	Aden et al.	5,686,826 A	11/1997	Kurtz et al.
5,467,384 A	11/1995	Skinner, Sr.	5,687,174 A	11/1997	Edem et al.
5,469,437 A	11/1995	Runaldu	5,689,230 A	11/1997	Merwin et al.
5,477,091 A	12/1995	Fiorina et al.	5,692,917 A	12/1997	Rieb et al.
5,483,574 A	1/1996	Yuyama	5,696,660 A	12/1997	Price
5,483,656 A	1/1996	Oprescu et al.	5,706,287 A	1/1998	Leimkoetter
5,485,488 A	1/1996	Van Brunt et al.	5,715,174 A	2/1998	Cotichini et al.
5,488,306 A	1/1996	Bonaccio	5,715,287 A	2/1998	Wadhawan et al.
5,491,463 A	2/1996	Sargeant et al.	5,729,154 A	3/1998	Taguchi et al.
5,493,684 A	2/1996	Gephardt et al.	5,729,204 A	3/1998	Fackler et al.
5,497,460 A	3/1996	Bailey et al.	5,742,216 A	4/1998	Iwasaki et al.
5,498,911 A	3/1996	Bossler et al.	5,742,514 A	4/1998	Bonola
5,513,370 A	4/1996	Paul	5,742,833 A	4/1998	Dea et al.
5,514,859 A	5/1996	Seigel	5,756,280 A	5/1998	Soora et al.
5,515,303 A	5/1996	Cargin, Jr. et al.	5,758,101 A	5/1998	Pemberton
5,517,172 A	5/1996	Chiu	5,761,084 A	6/1998	Edwards
5,519,882 A	5/1996	Asano et al.	5,764,647 A	6/1998	Riley
5,523,747 A	6/1996	Wise	5,766,133 A	6/1998	Faisandier
5,526,349 A	6/1996	Diaz et al.	5,768,301 A	6/1998	Dreyer et al.
5,528,248 A	6/1996	Steiner et al.	5,779,196 A	7/1998	Timar
5,528,507 A	6/1996	McNamara et al.	5,781,015 A	7/1998	Duffin et al.
5,528,661 A	6/1996	Siu et al.	5,783,999 A	7/1998	Price et al.
5,531,611 A	7/1996	Reed et al.	5,784,441 A	7/1998	Davis et al.
5,532,898 A	7/1996	Price	5,790,363 A	8/1998	Chaudhry
5,535,336 A	7/1996	Smith et al.	5,793,764 A	8/1998	Bartoldus et al.
5,537,468 A	7/1996	Hartmann	5,796,185 A	8/1998	Takata et al.
5,540,235 A	7/1996	Wilson	5,796,965 A	8/1998	Choi et al.
5,541,957 A	7/1996	Lau	5,799,040 A	8/1998	Lau
5,548,466 A	8/1996	Smith	5,799,194 A	8/1998	Allen et al.
5,560,022 A	9/1996	Dunstan et al.	5,799,196 A	8/1998	Flannery
5,560,357 A	10/1996	Faupel et al.	5,802,042 A	9/1998	Natarajan et al.
5,563,489 A	10/1996	Murry	5,802,305 A	9/1998	McKaughan et al.
5,568,525 A	10/1996	de Nijs et al.	5,805,597 A	9/1998	Edem
5,570,002 A	10/1996	Castleman	5,805,904 A	9/1998	Jung
5,572,182 A	11/1996	De Pinho Filho et al.	5,808,846 A	9/1998	Holce et al.
5,574,748 A	11/1996	Vander Mey et al.	5,810,606 A	9/1998	Ballast et al.
5,577,023 A	11/1996	Marum et al.	5,812,531 A	9/1998	Cheung et al.
5,577,026 A	11/1996	Gordon et al.	5,814,900 A	9/1998	Esser et al.
5,578,991 A	11/1996	Scholder	5,815,665 A	9/1998	Teper et al.
5,581,772 A	12/1996	Nanno et al.	5,821,868 A	10/1998	Kuhling
5,586,054 A	12/1996	Jensen et al.	5,828,293 A	10/1998	Rickard
5,594,332 A	1/1997	Harman et al.	5,834,942 A	11/1998	De Angelis
5,594,732 A	1/1997	Bell et al.	5,835,005 A	11/1998	Furukawa et al.
5,596,473 A	1/1997	Johnson et al.	5,836,785 A	11/1998	Lee
5,596,637 A	1/1997	Pasetti et al.	5,838,683 A	11/1998	Corley et al.
5,608,545 A	3/1997	Kagawa	5,841,203 A	11/1998	Chambers et al.
5,608,792 A	3/1997	Laidler	5,841,360 A	11/1998	Binder
5,610,593 A	3/1997	Seto	5,842,955 A	12/1998	Wilkinson
5,617,418 A	4/1997	Shirani et al.	5,845,150 A	12/1998	Henion
5,623,184 A	4/1997	Rector	5,845,190 A	12/1998	Bushue et al.
5,630,058 A	5/1997	Mosley et al.	5,848,149 A	12/1998	Chen et al.
5,631,570 A	5/1997	King	5,854,824 A	12/1998	Bengal et al.
5,631,846 A	5/1997	Szurkowski	5,854,839 A	12/1998	Chen et al.
5,635,896 A	6/1997	Tinsley et al.	5,859,584 A	1/1999	Counsell et al.
5,642,248 A	6/1997	Campolo et al.	5,859,596 A	1/1999	McRae
5,645,434 A	7/1997	Leung	5,884,086 A	3/1999	Amoni et al.
5,649,001 A	7/1997	Thomas et al.	5,896,415 A	4/1999	Owens et al.
			5,896,509 A	4/1999	Sugimoto
			5,909,445 A	6/1999	Schneider
			5,915,002 A	6/1999	Shimosako
			5,918,016 A	6/1999	Brewer et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

5,920,253 A	7/1999	Laine	6,172,606 B1	1/2001	Lockyer
5,920,266 A	7/1999	Allgood et al.	6,175,556 B1	1/2001	Allen, Jr. et al.
5,923,363 A	7/1999	Elberbaum	6,178,176 B1	1/2001	Voloshin et al.
5,923,663 A *	7/1999	Bontemps et al. 370/445	6,178,455 B1	1/2001	Schutte et al.
5,929,624 A	7/1999	Ricq et al.	6,178,458 B1	1/2001	Wang
5,929,626 A	7/1999	Iwasaki et al.	6,178,514 B1	1/2001	Wood
5,929,778 A	7/1999	Asama et al.	6,181,140 B1	1/2001	Vokey et al.
5,933,073 A	8/1999	Shuey	6,186,803 B1	2/2001	Garside
5,933,590 A	8/1999	Allen	6,205,137 B1	3/2001	Ariga
5,937,033 A	8/1999	Bellows	6,215,789 B1	4/2001	Keenan et al.
5,939,801 A	8/1999	Bouffard et al.	6,218,930 B1	4/2001	Katzenberg et al.
5,944,659 A	8/1999	Flach et al.	6,219,216 B1	4/2001	Holce et al.
5,944,824 A	8/1999	He	6,222,852 B1	4/2001	Gandy
5,944,831 A	8/1999	Pate et al.	6,233,613 B1	5/2001	Walker et al.
5,946,180 A	8/1999	Simpson	6,233,689 B1	5/2001	Allen et al.
5,948,077 A	9/1999	Choi et al.	6,236,625 B1	5/2001	Schell et al.
5,949,806 A	9/1999	Ness et al.	6,236,653 B1	5/2001	Dalton et al.
5,949,974 A	9/1999	Ewing et al.	6,243,394 B1	6/2001	Deng
5,953,314 A	9/1999	Ganmukhi et al.	6,243,818 B1	6/2001	Schwan et al.
5,960,208 A	9/1999	Obata et al.	6,246,748 B1	6/2001	Yano
5,963,557 A	10/1999	Eng	6,252,878 B1	6/2001	Locklear, Jr. et al.
5,971,804 A	10/1999	Gallagher et al.	6,253,121 B1	6/2001	Cline et al.
5,991,311 A	11/1999	Long et al.	6,259,745 B1	7/2001	Chan
5,991,885 A	11/1999	Chang et al.	6,272,219 B1	8/2001	De Bruycker et al.
5,994,998 A	11/1999	Fisher et al.	6,272,552 B1	8/2001	Melvin et al.
5,995,348 A	11/1999	McCartan et al.	6,275,498 B1	8/2001	Bisceglia et al.
5,995,353 A	11/1999	Cunningham et al.	6,278,357 B1	8/2001	Croushore et al.
6,000,003 A	12/1999	Allen et al.	6,278,665 B1	8/2001	Schell et al.
6,005,760 A	12/1999	Holce et al.	6,279,060 B1	8/2001	Luke et al.
6,009,479 A	12/1999	Jeffries	6,292,901 B1	9/2001	Lys et al.
6,011,680 A	1/2000	Solleder et al.	6,295,356 B1	9/2001	De Nicolo
6,011,794 A	1/2000	Mordowitz et al.	6,295,569 B1	9/2001	Shimura et al.
6,011,910 A	1/2000	Chau et al.	6,300,847 B1	10/2001	Gallagher et al.
6,016,519 A	1/2000	Chida et al.	6,301,527 B1	10/2001	Butland et al.
6,018,452 A	1/2000	Meyerhoefer et al.	6,311,173 B1	10/2001	Levin et al.
6,021,493 A	2/2000	Cromer et al.	6,314,102 B1	11/2001	Czerwiec et al.
6,021,496 A	2/2000	Dutcher et al.	6,317,675 B1	11/2001	Stolzl et al.
6,031,368 A	2/2000	Klippel et al.	6,324,268 B1	11/2001	Balachandran et al.
6,033,101 A	3/2000	Reddick et al.	6,329,810 B1	12/2001	Reid
6,038,457 A	3/2000	Barkat	6,332,166 B1	12/2001	Cranford, Jr. et al.
6,042,390 A	3/2000	Leung	6,344,794 B1	2/2002	Ulrich et al.
6,044,081 A	3/2000	Bell et al.	6,348,874 B1	2/2002	Cole et al.
6,047,376 A	4/2000	Hosoe	6,349,353 B1	2/2002	Lewis et al.
6,049,139 A	4/2000	Nagaura et al.	6,351,648 B1	2/2002	Karapetkov et al.
6,049,881 A	4/2000	Massman et al.	6,359,906 B1	3/2002	Dyke et al.
6,057,670 A	5/2000	Sink et al.	6,362,909 B1	3/2002	Bedrosian
6,064,305 A	5/2000	Lockyer	6,366,143 B1	4/2002	Liu et al.
6,069,899 A	5/2000	Foley	6,366,208 B1	4/2002	Hopkins et al.
6,091,722 A	7/2000	Russell et al.	6,366,618 B1	4/2002	Miller
6,092,131 A	7/2000	Caldwell et al.	6,373,851 B1	4/2002	Dadario
6,092,196 A	7/2000	Reiche	6,377,874 B1	4/2002	Ykema
6,095,867 A	8/2000	Brandt et al.	6,383,076 B1	5/2002	Tiedeken
6,097,761 A	8/2000	Buhring et al.	6,384,755 B1	5/2002	Hayden
6,100,471 A	8/2000	Fouache	6,385,030 B1	5/2002	Beene
6,101,459 A	8/2000	Tavallaei et al.	6,393,050 B1	5/2002	Liu
6,108,330 A	8/2000	Bhatia et al.	6,393,474 B1	5/2002	Eichert et al.
6,111,936 A	8/2000	Bremer	6,393,607 B1	5/2002	Hughes et al.
6,115,468 A	9/2000	De Nicolo	6,396,391 B1	5/2002	Binder
6,121,778 A	9/2000	Moore	6,398,779 B1	6/2002	Buysse et al.
6,125,448 A	9/2000	Schwan et al.	6,415,244 B1	7/2002	Dickens et al.
6,130,894 A	10/2000	Ojard et al.	6,418,332 B1	7/2002	Mastrototaro et al.
6,130,896 A	10/2000	Lueker et al.	6,420,976 B1	7/2002	Baggs et al.
6,134,666 A	10/2000	De Nicolo	6,449,348 B1	9/2002	Lamb et al.
6,137,839 A	10/2000	Mannering et al.	6,456,625 B1	9/2002	Itoi
6,140,911 A	10/2000	Fisher et al.	6,459,175 B1	10/2002	Potega
6,141,763 A	10/2000	Smith et al.	6,473,608 B1	10/2002	Lehr et al.
6,144,722 A	11/2000	Anderson et al.	6,480,510 B1	11/2002	Binder
6,147,601 A	11/2000	Sandelman et al.	6,483,903 B1	11/2002	Itay et al.
6,147,603 A	11/2000	Rand	6,496,103 B1	12/2002	Weiss et al.
6,147,963 A	11/2000	Walker et al.	6,504,825 B1	1/2003	Atkins et al.
6,154,488 A	11/2000	Hunt	6,522,151 B2	2/2003	Armistead et al.
6,157,534 A	12/2000	Gallagher et al.	6,526,516 B1	2/2003	Ishikawa et al.
6,169,475 B1	1/2001	Browning	6,529,127 B2	3/2003	Townsend et al.
6,169,883 B1	1/2001	Vimpari et al.	6,535,983 B1	3/2003	McCormack et al.
6,171,152 B1	1/2001	Kunz	6,546,494 B1	4/2003	Jackson et al.
			6,571,181 B1	5/2003	Rakshani et al.
			6,587,454 B1	7/2003	Lamb
			6,640,308 B1	10/2003	Keyghobad et al.
			6,643,566 B1	11/2003	Lehr et al.

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.