



US008155012B2

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

(10) **Patent No.:** **US 8,155,012 B2**
(45) **Date of Patent:** **Apr. 10, 2012**

(54) **SYSTEM AND METHOD FOR ADAPTING A
PIECE OF TERMINAL EQUIPMENT**

FOREIGN PATENT DOCUMENTS

DE 3907652 A1 9/1990
(Continued)

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

OTHER PUBLICATIONS

Entertainment Services and Technology Association (ESTA)—Recommended Practice for Ethernet Cabling Systems in Entertainment Lighting Applications [44 pages] (1996).

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

(Continued)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 331 days.

Primary Examiner — Chi Pham

Assistant Examiner — Soon-Dong Hyun

(21) Appl. No.: **12/239,001**

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

(22) Filed: **Sep. 26, 2008**

(65) **Prior Publication Data**

US 2009/0022057 A1 Jan. 22, 2009

Related U.S. Application Data

(63) 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)

(52) **U.S. Cl.** **370/241; 370/445; 340/568.1**

(58) **Field of Classification Search** None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

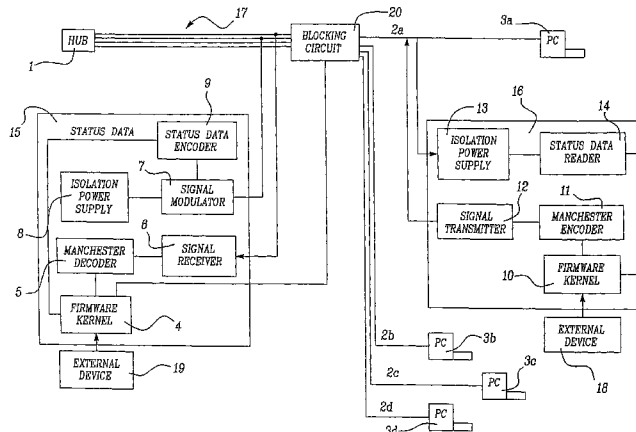
202,495 A 4/1878 Watson

(Continued)

(57) **ABSTRACT**

In accordance with the teachings of the present invention, a communication system (17) is provided for generating and monitoring data over pre-existing conductors (2A-2D) between associated pieces of networked computer equipment (3A-3D). The system includes a communication device (16) attached to the electronic equipment that transmits information to a central module (15) by impressing a low frequency signal on the pre-existing data lines of the remotely located equipment. A receiver (6) in the central module (15) monitors the low frequency data on the data lines to determine the transmitted information of the electronic equipment. The communication device may also be powered by a low current power signal from the central module (15). The power signal to the communication device may also be fluctuated to provide useful information, such as status information, to the communication device. Relocation of the electronic equipment with attached communication device to another location on the network is detected immediately and may be used to update a database. This invention is particularly adapted to be used with an existing Ethernet communications link or equivalents thereof.

148 Claims, 13 Drawing Sheets



U.S. PATENT DOCUMENTS			
406,567 A	7/1889 Edison	4,484,028 A	11/1984 Kelley et al.
2,846,509 A	8/1958 Dubuar	4,487,836 A	12/1984 Takayanagi et al. 436/2
3,359,379 A	12/1967 Pullum et al. 379/340	4,494,541 A	1/1985 Archibald 606/35
3,407,400 A	10/1968 Lurie	4,495,494 A	1/1985 McCune
3,408,643 A	10/1968 Sliman	4,507,568 A	3/1985 Ziegler et al. 307/112
3,423,521 A	1/1969 Friesen et al. 725/84	4,524,349 A	6/1985 Hyatt
3,425,050 A	1/1969 Tellerman et al.	4,527,216 A	7/1985 Stammely
3,500,132 A	3/1970 Garrett 361/186	4,528,667 A	7/1985 Fruhauf 714/809
3,535,472 A	10/1970 Babbitt, III 455/14	4,532,626 A	7/1985 Flores et al. 370/438
3,537,095 A	10/1970 Cones	4,535,401 A	8/1985 Penn 700/3
3,593,274 A	7/1971 Krugler, Jr. 340/458	4,551,671 A	11/1985 Annunziata et al.
3,597,549 A	8/1971 Farmer et al.	4,564,726 A	1/1986 Ibata 379/166
3,618,065 A	11/1971 Trip et al. 340/568.3	4,578,539 A	3/1986 Townsing
3,634,845 A	1/1972 Colman 340/508	4,593,389 A	6/1986 Wurzburg et al.
3,659,277 A	4/1972 Brown	4,602,364 A	7/1986 Herman et al.
3,696,378 A	10/1972 Daniel	4,617,656 A	10/1986 Kobayashi et al.
3,697,984 A	10/1972 Atkinson et al.	4,622,541 A	11/1986 Stockdale 340/566
3,731,012 A	5/1973 Shaffer 379/380	4,631,367 A	12/1986 Coviello et al.
3,758,728 A	9/1973 Le Roch et al. 379/4	4,633,217 A	12/1986 Akano
3,768,084 A	10/1973 Haynes 377/12	4,636,771 A	1/1987 Ochs
3,781,481 A	12/1973 Shaffer et al. 379/299	4,639,714 A	1/1987 Crowe 375/259
3,794,989 A	2/1974 Manley et al.	4,647,721 A	3/1987 Busam et al.
3,818,179 A	6/1974 Mase 219/267	4,647,912 A	3/1987 Bates et al.
3,828,139 A	8/1974 Chambers, Jr. 379/401	4,649,548 A	3/1987 Crane
3,832,521 A	8/1974 Niendorf 219/130.32	4,654,640 A	3/1987 Carll et al.
3,836,901 A	9/1974 Matto et al.	4,656,318 A	4/1987 Noyes 379/102.04
3,848,179 A	11/1974 Kayama 323/280	4,658,242 A	4/1987 Zeder
3,863,036 A	1/1975 McCrudden	4,661,797 A	4/1987 Schmall 340/561
3,868,484 A	2/1975 Bolton et al. 340/455.2	4,670,902 A	6/1987 Nairwirt
3,886,419 A	5/1975 Omura et al. 318/132	4,674,084 A	6/1987 Suzuki et al.
3,932,857 A	1/1976 Way et al.	4,685,129 A	8/1987 Gavrilovich
3,983,338 A	9/1976 Mathauser 379/30	4,686,514 A	8/1987 Liptak et al. 340/571
4,024,359 A	5/1977 De Marco et al.	4,691,344 A	9/1987 Brown et al.
4,024,360 A	5/1977 Biraghi et al.	4,692,761 A	9/1987 Robinton 340/825.01
4,063,220 A	12/1977 Metcalfe et al.	4,701,630 A	10/1987 Annunziata et al.
4,064,431 A	12/1977 Cote 362/4	4,701,946 A	10/1987 Oliva et al.
4,101,878 A	7/1978 Shimizu et al. 307/140	4,712,233 A	12/1987 Kuo 379/386
4,121,201 A	10/1978 Weathers	4,717,896 A	1/1988 Graham
4,128,804 A	12/1978 Russell 324/424	4,719,616 A	1/1988 Akano
4,131,767 A	12/1978 Weinstein 379/406.06	4,723,267 A	2/1988 Jones et al. 379/93.05
4,156,799 A	5/1979 Cave	4,728,948 A	3/1988 Fields
4,160,884 A	7/1979 Bishop 379/348	4,731,810 A	3/1988 Watkins 379/33
4,161,719 A	7/1979 Parikh et al. 375/365	4,731,829 A	3/1988 Bonnet et al.
4,173,714 A	11/1979 Bloch et al.	4,733,223 A	3/1988 Gilbert
4,179,688 A	12/1979 Romnet 340/815.83	4,733,389 A	3/1988 Puvogel
4,186,339 A	1/1980 Finger 324/142	4,736,195 A	4/1988 McMurtry et al.
4,191,971 A	3/1980 Dischert et al. 348/211.11	4,737,787 A	4/1988 Ito et al.
4,230,912 A	10/1980 Lee et al.	4,751,498 A	6/1988 Shalvi et al. 340/524
4,232,199 A	11/1980 Boatwright et al. 379/197	4,755,792 A	7/1988 Pezzolo et al. 340/538
4,254,305 A	3/1981 Treiber 379/324	4,755,922 A	7/1988 Puvogel
4,260,882 A	4/1981 Barnes 250/205	4,758,823 A	7/1988 Berruyer et al.
4,268,723 A	5/1981 Taylor 379/395.01	4,760,382 A	7/1988 Faulkner
4,273,955 A	6/1981 Armstrong	4,766,386 A	8/1988 Oliver et al. 324/533
4,277,740 A	7/1981 Parks 324/540	4,779,153 A	10/1988 Tsubota 360/96.51
4,282,407 A	8/1981 Stiefel 379/377	4,782,322 A	11/1988 Lechner et al.
4,290,056 A	9/1981 Chow 340/538	4,782,355 A	11/1988 Sakai et al. 396/72
4,293,948 A	10/1981 Soderblom	4,785,812 A	11/1988 Pihl et al. 607/8
4,303,073 A	12/1981 Archibald 606/35	4,799,211 A	1/1989 Felker et al. 370/252
4,313,081 A	1/1982 Smith 323/209	4,813,066 A	3/1989 Holtz et al.
4,315,107 A	2/1982 Ciesielka et al. 379/400	4,815,106 A	3/1989 Propp et al. 375/257
4,322,677 A	3/1982 Wright 324/531	4,817,106 A	3/1989 Thompson 372/50.12
4,340,788 A	7/1982 Sbuelz	4,821,319 A	4/1989 Middleton et al. 379/167.13
4,348,661 A	9/1982 Lucchesi	4,823,600 A	4/1989 Biegel et al.
4,349,703 A	9/1982 Chea, Jr. 379/382	4,825,349 A	4/1989 Marcel 363/50
4,367,455 A	1/1983 Fried 340/310.11	4,839,886 A	6/1989 Wu 370/463
4,383,315 A	5/1983 Tornig	4,862,158 A	8/1989 Keller et al.
4,388,667 A	6/1983 Saurenman 361/231	4,864,598 A	9/1989 Lynch et al.
4,397,020 A	8/1983 Howson 350/510	4,866,768 A	9/1989 Sinberg
4,398,066 A	8/1983 Sinberg 379/412	4,875,223 A	10/1989 Curtis 375/258
4,410,982 A	10/1983 Fleischfresser et al. 370/384	4,882,728 A	11/1989 Herman
4,413,250 A	11/1983 Porter et al.	4,884,263 A	11/1989 Suzuki 370/225
4,454,477 A	6/1984 Joffe	4,884,287 A	11/1989 Jones et al. 375/377
4,463,352 A	7/1984 Forbes et al. 370/424	4,885,563 A	12/1989 Johnson et al. 375/259
4,464,658 A	8/1984 Thelen	4,896,315 A	1/1990 Felker et al.
4,467,314 A	8/1984 Weikel et al. 700/295	4,901,003 A	2/1990 Clegg
4,475,079 A	10/1984 Gale 324/533	4,901,217 A	2/1990 Wilson 363/126
		4,903,006 A	2/1990 Boomgaard 307/3

US 8,155,012 B2

4,918,688 A	4/1990	Krause et al.	5,249,183 A	9/1993	Wong et al.
4,922,503 A	5/1990	Leone	5,255,962 A	10/1993	Neuhnus et al. 303/188
4,926,158 A	5/1990	Zeigler 370/294	5,257,287 A	10/1993	Blumenthal et al.
4,935,926 A	6/1990	Herman	5,260,664 A	11/1993	Graham
4,935,959 A	6/1990	Markovic et al.	5,264,777 A	11/1993	Smead
4,937,811 A	6/1990	Harris 370/200	5,267,238 A	11/1993	Yano et al. 370/452
4,937,851 A	6/1990	Lynch et al.	5,270,896 A	12/1993	McDonald 361/45
4,942,604 A	7/1990	Smith et al.	5,275,172 A	1/1994	Ives 600/544
4,951,309 A	8/1990	Gross et al. 379/102.04	5,278,888 A	1/1994	Myllymaki
4,953,055 A	8/1990	Douhet et al.	5,280,251 A	1/1994	Strangio
4,958,371 A	9/1990	Damoci et al.	5,285,477 A	2/1994	Leonowich 375/257
4,961,222 A	10/1990	Johansson et al.	5,289,359 A	2/1994	Ziermann
4,969,179 A	11/1990	Kanare et al. 379/33	5,289,458 A	2/1994	Taha
4,973,954 A	11/1990	Schwartz 370/475	5,289,461 A	2/1994	de Nijs
4,980,913 A	12/1990	Skret	5,297,141 A *	3/1994	Marum 370/402
4,991,123 A	2/1991	Casamassima	5,301,246 A	4/1994	Archibald et al.
4,992,774 A	2/1991	McCullough 345/204	5,302,889 A	4/1994	Marsh 323/284
4,998,275 A	3/1991	Braunstein et al.	5,306,956 A	4/1994	Ikeda et al. 307/125
4,998,850 A	3/1991	Crowell 406/48	5,311,114 A	5/1994	Sambamurthy et al.
5,003,457 A	3/1991	Ikei et al. 700/4	5,311,518 A	5/1994	Takato et al.
5,003,579 A	3/1991	Jones	5,313,642 A	5/1994	Seigel 713/323
5,007,858 A	4/1991	Daly et al. 439/498	5,315,237 A	5/1994	Iwakura et al. 324/754
5,020,100 A	5/1991	Gardiner	5,321,372 A	6/1994	Smith 333/1
5,020,773 A	6/1991	Tuft et al. 251/129.12	5,323,461 A	6/1994	Rosenbaum et al. 379/399.01
5,021,779 A	6/1991	Bisak 340/825.69	5,333,177 A	7/1994	Braitberg et al. 455/559
5,029,201 A	7/1991	Bindels 379/93.25	5,333,192 A	7/1994	McGinn
5,032,819 A	7/1991	Sakuragi et al.	5,345,422 A	9/1994	Redwine 365/189.09
5,032,833 A	7/1991	Laporte 340/825.02	5,345,592 A	9/1994	Woodmas 725/130
5,033,112 A	7/1991	Bowling et al. 398/110	5,347,225 A	9/1994	Graham
5,034,723 A	7/1991	Maman	5,351,272 A	9/1994	Abraham 375/260
5,034,738 A	7/1991	Ishihara et al.	5,353,009 A	10/1994	Marsh 340/505
5,034,978 A	7/1991	Nguyen et al.	5,365,515 A	11/1994	Graham
5,038,782 A	8/1991	Gevens et al. 600/383	5,368,041 A	11/1994	Shambroom 600/544
5,051,723 A	9/1991	Long et al.	5,379,441 A	1/1995	Watanabe et al. 710/317
5,055,827 A	10/1991	Philipp	5,381,804 A	1/1995	Shambroom 600/544
5,056,131 A	10/1991	Kanare et al. 379/33	5,384,429 A	1/1995	Bulson et al. 174/102 R
5,059,782 A	10/1991	Fukuyama 250/214 A	5,389,882 A	2/1995	l'Anson 324/522
5,059,948 A	10/1991	Desmeules 340/568.4	5,396,555 A	3/1995	Shibata
5,063,563 A	11/1991	Ikeda et al.	5,406,260 A	4/1995	Cummings et al.
5,063,585 A	11/1991	Shapiro 379/30	5,408,669 A	4/1995	Stewart et al. 713/300
5,066,939 A	11/1991	Mansfield, Jr. 455/402	5,414,708 A	5/1995	Webber et al. 370/445
5,066,942 A	11/1991	Matsuo 340/568.2	5,414,709 A	5/1995	Baze
5,076,763 A	12/1991	Anastos 417/44.11	5,422,519 A	6/1995	Russell 307/104
5,077,526 A	12/1991	Vokey et al. 324/541	5,424,710 A	6/1995	Baumann
RE33,807 E	1/1992	Abel et al.	5,438,606 A	8/1995	Cerulli 379/24
5,089,974 A	2/1992	Demeyer et al.	5,440,335 A	8/1995	Beveridge 725/106
5,093,828 A	3/1992	Braun et al. 370/451	5,441,520 A	8/1995	Olsen et al. 607/6
RE33,900 E	4/1992	Howson 370/105	5,444,184 A	8/1995	Hassel 174/113 R
5,119,398 A	6/1992	Webber, Jr.	5,450,486 A	9/1995	Maas et al.
5,119,402 A	6/1992	Ginzburg et al. 375/288	5,452,344 A	9/1995	Larson 340/538.11
5,121,482 A	6/1992	Patton 710/16	5,455,467 A	10/1995	Young et al. 307/104
5,121,500 A	6/1992	Arlington et al. 713/330	5,457,629 A	10/1995	Miller et al. 701/1
5,124,982 A	6/1992	Kaku	5,459,283 A	10/1995	Birdwell, Jr.
5,131,033 A	7/1992	Reum 379/413	5,461,671 A	10/1995	Sakuragi et al. 379/400
5,133,005 A	7/1992	Kelly et al.	5,467,384 A	11/1995	Skinner, Sr. 455/402
5,136,580 A	8/1992	Videloek et al.	5,469,437 A	11/1995	Runaldue
5,142,269 A	8/1992	Mueller	5,477,091 A	12/1995	Fiorina et al.
5,144,544 A	9/1992	Jenneve et al.	5,483,574 A	1/1996	Yuyama 379/32.04
5,148,144 A	9/1992	Sutterlin et al.	5,483,656 A	1/1996	Oprescu et al. 713/320
5,164,960 A	11/1992	Wincn et al.	5,485,488 A	1/1996	Van Brunt et al.
5,168,170 A	12/1992	Hartig	5,488,306 A	1/1996	Bonaccio
5,179,291 A	1/1993	Nishikawa et al.	5,491,463 A	2/1996	Sargeant et al.
5,179,710 A	1/1993	Coschieri 713/300	5,493,684 A	2/1996	Gephardt et al. 713/322
5,181,240 A	1/1993	Sakuragi	5,497,460 A	3/1996	Bailey
5,189,409 A	2/1993	Okuno 340/825.57	5,498,911 A	3/1996	Bossler 307/10.1
5,192,231 A	3/1993	Dolin, Jr. 439/620.21	5,513,370 A	4/1996	Paul 709/249
5,195,183 A *	3/1993	Miller et al. 709/231	5,514,859 A	5/1996	Seigel
5,199,049 A	3/1993	Wilson 375/351	5,515,303 A	5/1996	Cargin, Jr. et al. 361/683
5,200,743 A	4/1993	St. Martin et al.	5,517,172 A	5/1996	Chiu 340/5.7
5,200,877 A	4/1993	Betton et al. 361/92	5,519,882 A	5/1996	Asano et al. 710/10
5,216,704 A	6/1993	Williams et al.	5,528,248 A	6/1996	Steiner et al. 342/357.06
5,222,164 A	6/1993	Bass, Sr. et al. 385/14	5,528,661 A	6/1996	Siu et al. 379/29.01
5,223,806 A	6/1993	Curtis et al. 333/12	5,532,898 A	7/1996	Price 361/119
5,226,120 A	7/1993	Brown et al.	5,537,468 A	7/1996	Hartman 379/221.01
5,231,375 A	7/1993	Sanders et al.	5,540,235 A	7/1996	Wilson 600/554
5,235,599 A	8/1993	Nishimura et al. 714/4	5,541,957 A	7/1996	Lau 375/258
5,237,606 A	8/1993	Ziermann	5,548,466 A	8/1996	Smith 361/44

US 8,155,012 B2

5,563,489	A	10/1996	Murry	318/778	5,854,839	A	12/1998	Chen et al.	379/413
5,570,002	A	10/1996	Castleman	323/283	5,859,584	A	1/1999	Counsell et al.	340/538
5,572,182	A	11/1996	De Pinho Filho	340/855.4	5,859,596	A	1/1999	McRae	340/870.02
5,574,748	A	11/1996	Vander Mey et al.	375/139	5,884,086	A	3/1999	Amoni et al.	713/300
5,578,991	A	11/1996	Scholder		5,915,002	A	6/1999	Shimosako	379/93.07
5,581,772	A	12/1996	Nanno et al.	713/340	5,918,016	A	6/1999	Brewer et al.	709/220
5,594,332	A	1/1997	Harman et al.	324/127	5,920,253	A	7/1999	Laine	375/259
5,596,637	A	1/1997	Pasetti et al.	379/399.02	5,923,363	A	7/1999	Elberbaum	348/156
5,608,545	A	3/1997	Kagawa	358/468	5,929,624	A	7/1999	Ricq et al.	324/67
5,608,792	A	3/1997	Laidner	379/386	5,929,778	A	7/1999	Asama et al.	
5,617,418	A	4/1997	Shirani et al.	370/465	5,933,073	A	8/1999	Shuey	375/258
5,623,184	A	4/1997	Rector	315/102	5,933,590	A	8/1999	Allen	714/4
5,630,058	A	5/1997	Mosley et al.	726/35	5,937,033	A	8/1999	Bellows	379/29.01
5,631,570	A	5/1997	King	324/718	5,939,801	A	8/1999	Bouffard	307/65
5,635,896	A	6/1997	Tinsley et al.	340/310.15	5,944,659	A	8/1999	Flach et al.	600/300
5,642,248	A	6/1997	Campolo et al.	361/42	5,944,824	A	8/1999	He	726/6
5,649,001	A	7/1997	Thomas et al.	379/93.07	5,944,831	A	8/1999	Pate et al.	713/324
5,652,479	A	7/1997	LoCascio et al.	315/225	5,946,180	A	8/1999	Simpson	361/93.3
5,652,575	A	7/1997	Pryor et al.	379/29.11	5,948,077	A	9/1999	Choi et al.	
5,652,893	A	7/1997	Ben-Meir et al.	713/310	5,949,806	A	9/1999	Ness et al.	372/38.07
5,652,895	A	7/1997	Poisner	713/322	5,953,314	A *	9/1999	Ganmukhi et al.	370/220
5,655,077	A	8/1997	Johnes et al.	726/8	5,960,208	A	9/1999	Obata et al.	713/330
5,659,542	A	8/1997	Bell et al.	370/496	5,963,557	A	10/1999	Eng	
5,664,002	A	9/1997	Skinner, Sr.	379/56.2	5,991,311	A	11/1999	Long et al.	
5,670,937	A	9/1997	Right et al.	340/506	5,991,885	A	11/1999	Chang et al.	
5,671,354	A	9/1997	Ito et al.	726/3	5,994,998	A	11/1999	Fisher et al.	
5,675,321	A	10/1997	McBride		5,995,348	A	11/1999	McCartan et al.	361/42
5,675,371	A	10/1997	Barringer	725/148	5,995,353	A	11/1999	Cunningham et al.	361/111
5,675,811	A	10/1997	Broedner	713/323	6,000,003	A	12/1999	Allen	
5,675,813	A	10/1997	Holmdahl	713/310	6,005,760	A	12/1999	Holce et al.	361/93.6
5,678,547	A	10/1997	Faupel et al.	600/409	6,011,680	A	1/2000	Solleder et al.	361/90
5,678,559	A	10/1997	Drakulic	600/544	6,011,794	A	1/2000	Mordowitz	370/389
5,679,987	A	10/1997	Ogawa	307/147	6,011,910	A	1/2000	Chau et al.	709/229
5,684,826	A	11/1997	Ratner	375/222	6,016,519	A	1/2000	Chida et al.	710/19
5,684,950	A	11/1997	Dare et al.	726/10	6,018,452	A	1/2000	Meyerhoefer	361/111
5,686,826	A	11/1997	Kurtz et al.	323/365	6,021,493	A	2/2000	Cromer et al.	
5,689,230	A	11/1997	Merwin et al.	340/310.11	6,021,496	A	2/2000	Dutcher et al.	726/21
5,692,917	A	12/1997	Rieb et al.		6,031,368	A	2/2000	Klippel et al.	324/133
5,696,660	A	12/1997	Price	361/119	6,033,101	A	3/2000	Reddick et al.	700/286
5,706,287	A	1/1998	Leimkoetter	370/410	6,038,457	A	3/2000	Barkat	455/556.1
5,715,174	A	2/1998	Cotichini et al.		6,047,376	A	4/2000	Hosoe	726/5
5,729,204	A	3/1998	Fackler et al.	340/2.4	6,049,139	A	4/2000	Nagaura	307/10.1
5,742,514	A	4/1998	Bonola	700/286	6,049,881	A	4/2000	Massman et al.	713/300
5,742,833	A	4/1998	Dea et al.	713/323	6,057,670	A	5/2000	Sink et al.	320/117
5,758,101	A	5/1998	Pemberton	710/302	6,064,305	A	5/2000	Lockyer	
5,761,084	A	6/1998	Edwards	700/293	6,092,131	A	7/2000	Caldwell et al.	710/100
5,764,647	A	6/1998	Riley		6,092,196	A	7/2000	Reiche	726/6
5,766,133	A	6/1998	Faisandier	600/509	6,095,867	A	8/2000	Brandt et al.	439/620.09
5,779,196	A	7/1998	Timar	244/209	6,097,761	A	8/2000	Buhning et al.	375/257
5,781,015	A	7/1998	Duffin et al.	324/508	6,100,471	A	8/2000	Fouache	174/72.C
5,783,999	A	7/1998	Price et al.	340/644	6,101,459	A	8/2000	Tavallaie	702/152
5,784,441	A	7/1998	Davis et al.	379/106.01	6,111,936	A	8/2000	Bremer	
5,790,363	A	8/1998	Chaudhry	361/119	6,115,468	A	9/2000	De Nicolo	
5,793,764	A *	8/1998	Bartoldus et al.	370/390	6,121,778	A	9/2000	Moore	324/619
5,796,185	A	8/1998	Takata et al.	307/140	6,125,448	A	9/2000	Schwan et al.	
5,796,965	A	8/1998	Choi et al.	713/300	6,130,894	A	10/2000	Ojard et al.	
5,799,040	A	8/1998	Lau	375/258	6,134,666	A	10/2000	De Nicolo	713/300
5,799,194	A	8/1998	Allen		6,140,911	A	10/2000	Fisher et al.	
5,799,196	A	8/1998	Flannery	713/320	6,141,763	A	10/2000	Smith et al.	713/300
5,802,042	A	9/1998	Natarajan et al.	370/255	6,144,722	A	11/2000	Anderson et al.	379/27.01
5,802,305	A	9/1998	McKaughan et al.	709/227	6,147,601	A	11/2000	Sandelman et al.	
5,805,597	A	9/1998	Edem	370/445	6,147,603	A	11/2000	Rand	
5,805,904	A	9/1998	Jung	713/300	6,147,963	A	11/2000	Walker et al.	
5,808,846	A	9/1998	Holce et al.	361/93.6	6,169,475	B1	1/2001	Browning	
5,810,606	A	9/1998	Ballast et al.	439/15	6,172,606	B1	1/2001	Lockyer	
5,814,900	A	9/1998	Esser et al.	307/104	6,175,556	B1	1/2001	Allen, Jr. et al.	370/293
5,815,665	A	9/1998	Teper et al.	709/229	6,178,458	B1	1/2001	Wang	709/232
5,821,868	A	10/1998	Kuhling		6,178,514	B1	1/2001	Wood	713/300
5,828,293	A	10/1998	Rickard	375/257	6,178,140	B1	1/2001	Vokey et al.	324/523
5,834,942	A	11/1998	De Angelis	324/522	6,205,137	B1 *	3/2001	Ariga	370/360
5,835,005	A	11/1998	Furukawa et al.	370/400	6,218,930	B1	4/2001	Katzenberg et al.	
5,836,785	A	11/1998	Lee	439/505	6,219,216	B1	4/2001	Holce et al.	361/94
5,841,203	A	11/1998	Chambers et al.	307/10.8	6,233,689	B1	5/2001	Allen et al.	713/320
5,841,360	A	11/1998	Binder		6,236,625	B1	5/2001	Schell et al.	369/13.22
5,842,955	A	12/1998	Wilkinson	482/52	6,243,394	B1	6/2001	Deng	
5,845,150	A	12/1998	Henion	710/19	6,243,818	B1	6/2001	Schwan et al.	713/300
5,845,190	A	12/1998	Bushue et al.	725/130	6,246,748	B1	6/2001	Yano	

6,272,219	B1	8/2001	De Bruycker et al.	
6,272,552	B1	8/2001	Melvin et al.	
6,275,498	B1*	8/2001	Bisceglia et al.	370/438
6,278,357	B1	8/2001	Croushore et al.	375/259
6,278,665	B1	8/2001	Schell et al.	369/13.22
6,279,060	B1	8/2001	Luke et al.	710/64
6,292,901	B1	9/2001	Lys et al.	713/300
6,295,356	B1	9/2001	De Nicolo	
6,295,569	B1	9/2001	Shimura et al.	710/305
6,301,527	B1	10/2001	Butland et al.	700/286
6,314,102	B1	11/2001	Czerwec et al.	
6,317,675	B1	11/2001	Stolzl et al.	701/76
6,329,810	B1	12/2001	Reid	324/117 H
6,344,794	B1	2/2002	Ulrich et al.	
6,348,874	B1	2/2002	Cole et al.	
6,349,353	B1	2/2002	Lewis et al.	710/300
6,351,648	B1	2/2002	Karapetkov et al.	455/466
6,359,906	B1	3/2002	Dyke et al.	
6,366,143	B1	4/2002	Liu et al.	327/142
6,366,208	B1	4/2002	Hopkins et al.	340/650
6,373,851	B1	4/2002	Dadario	
6,377,874	B1	4/2002	Ykema	700/286
6,384,755	B1	5/2002	Hayden	
6,393,050	B1	5/2002	Liu	75/219
6,393,474	B1	5/2002	Eichert et al.	709/223
6,393,607	B1	5/2002	Hughes et al.	725/130
6,396,391	B1	5/2002	Binder	340/538.15
6,398,779	B1	6/2002	Buyse et al.	606/34
6,418,332	B1	7/2002	Mastrototaro et al.	600/316
6,449,348	B1	9/2002	Lamb et al.	379/93.36
6,456,625	B1	9/2002	Itoi	370/401
6,459,175	B1	10/2002	Potega	307/149
6,473,608	B1	10/2002	Lehr et al.	
6,480,510	B1	11/2002	Binder	370/502
6,496,103	B1	12/2002	Weiss et al.	375/257
6,504,825	B1	1/2003	Atkins et al.	
6,522,151	B2	2/2003	Armistead et al.	
6,526,516	B1	2/2003	Ishikawa et al.	713/340
6,529,127	B2	3/2003	Townsend et al.	340/505
6,535,983	B1	3/2003	McCormack et al.	713/310
6,546,494	B1	4/2003	Jackson et al.	713/300
6,587,454	B1	7/2003	Lamb	370/352
6,643,566	B1	11/2003	Lehr et al.	
6,658,108	B1	12/2003	Bissell et al.	
6,681,013	B1	1/2004	Miyamoto	379/413
6,701,443	B1	3/2004	Bell	713/300
6,744,888	B1	6/2004	El-Kik et al.	379/412
6,889,095	B1	5/2005	Eidson et al.	700/12

FOREIGN PATENT DOCUMENTS

DE	42 03 304	A1	8/1992
DE	41 38 065	A1	5/1993
EP	0 357 482	A2	3/1990
EP	0 357 482	B1	3/1990
EP	0386659		9/1990
EP	0 415 312	A1	3/1991
EP	0 357 482	B1	7/1993
EP	0 639 916	A2	6/1994
EP	0 584 447	B1	6/1997
EP	0 852 018	B1	5/2003
FR	2 682 843	A1	10/1991
GB	2 249 919	A	5/1992
JP	60-164289		8/1985
JP	63-018741		1/1988
JP	63-059144		3/1988
JP	64-16053		1/1989
JP	01-160198		6/1989
JP	1160198		6/1989
JP	02-087762		3/1990
JP	2087762		3/1990
JP	4-20192		1/1992
JP	4-180430		6/1992
JP	5-150854		6/1993
JP	06-075652		3/1994
JP	6-75652		3/1994
JP	H6-244893		9/1994
JP	H8-204782		8/1996

JP	1998013576	A	1/1998
WO	92/17968		10/1992
WO	93/02510		2/1993
WO	PCT/IB96/00223		1/1996
WO	96/23377		8/1996
WO	96/29638		9/1996
WO	97/09667		3/1997
WO	98/57248		12/1998
WO	99/34591		7/1999

OTHER PUBLICATIONS

Model 505 Chip Transceiver Schematic [3 pages] (Jun. 27, 1988).
 Network World Article: "SynOptics touts FDDI products affordability" [2 pages] (Sep. 2, 1991).
 Communication Week Article: "FDDI Spec Consortium" [2 pages] (May 27, 1991).
 Network World Article: "DEC to show new FDDI, E-mail wares" [2 pages] (Jan. 28, 1991).
 Network World Article: "Proposed groups eye alternate FDDI media" [3 pages] (Nov. 12, 1990).
 H4000 Ethernet Transceiver Technical Manual [67 pages] (1982).
 Worldwide History of Telecommunications by Anton A. Hurdeman [38 pages] (No date).
 IBM Token-Ring Network Technology, # GA27-3832-0 [146 pages] (1986).
 IBM—Technical Reference—Personal Computer Hardware Reference Library, # 69X7862 [476 pages] (Jun. 1986).
 Token-Ring Network—Architecture Reference, # SC30-3374-02 [485 pages] (Sep. 1989).
 Using the IBM Cabling System with Communication Products, # GA27-3620-1 [355 pages] (Apr. 1986).
 Network World Article: "Token-ring sales take off" [3 pages] (Aug. 17, 1987).
 Closeup Article—The LAN Inner Circle [15 pages] (Mar. 25, 1985).
 Perspective Computer Systems News Article—Making Sure the Pieces Fit [7 pages] (Mar. 1988).
 Data Communications—McGraw-Hill's Technology Magazine for Network Managers: "Multivendor token ring networks coming of age" [5 pages] (Nov. 21, 1989).
 Understanding Token Ring Protocols and Standards by James T. Carlo, Robert D. Love, Michael S. Siegel and Kenneth T. Wilson—Artech House [4 pages] (1998).
 IBM Token-Ring Network Operates on Telephone Twisted-Pair Media (Marketing Announcement) by IBM [4 pages] (Oct. 15, 1985).
 Design of a Twisted Pair Cable for a Token Passing Local Area Network (Intl. Wire & Cable Symposium Proceedings) by Paul Abramson—IBM Corporation [3 pages] (1983).
 IBM Cabling System Planning and Installation Guide, # GA27-3361-07 [344 pages] (Oct. 1987).
 Local Area Network Station Connector (IBM Technical Disclosure Bulletin, vol. 27 No. 2) by E.J. Annunziata and T.E. Stammely [5 pages] (Jul. 1984).
 Product and Price Schedule (SynOptics, Inc.—p. 18 of 25) [1 page] (Aug. 1, 1991).
 Technical Report—"The Effect of Ethernet Behavior on Networks using High-performance Workstations and Servers" by Rich Seifert (Networks and Communications Consulting) [25 pages] (Mar. 3, 1995).
 Technical Report—"Issues in LAN Switching and Migration from a Shared LAN Environment" by Rich Seifert (Networks and Communications Consulting) [28 pages] (Nov. 1995).
 IBM Token-Ring Network—Introduction and Planning Guide, # GA27-3677-03 [241 pages] (Sep. 1990).
 IBM—"International Technical Support Organization High-Speed Networking Technology: An Introductory Survey", # GG24-3816-02 [480 pages] (Jun. 1995).
 IBM—"Local Area Network Concepts and Products: LAN Architecture", # SG24-4753-00 [262 pages] (May 1996).
 IBM—"Local Area Network Concepts and Products: Adapters, Hubs and ATM", # SG24-4754-00 [326 pages] (May 1996).

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.