



US007372826B2

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

(10) **Patent No.:** **US 7,372,826 B2**  
(45) **Date of Patent:** **May 13, 2008**

(54) **PROVIDING ADVANCED COMMUNICATIONS FEATURES**

5,634,196 A \* 5/1997 Alford ..... 455/18  
5,717,830 A \* 2/1998 Sigler et al. .... 455/426.1  
5,838,748 A \* 11/1998 Nguyen ..... 375/370

(75) Inventors: **Ashraf M. Dahod**, Andover, MA (US);  
**Michael Silva**, East Sandwich, MA (US);  
**Peter Higgins**, Sandwich, MA (US);  
**Rajat Ghai**, West Yarmouth, MA (US);  
**John DePietro**, Brewster, MA (US);  
**Nick Lopez**, Sleepy Hollow, IL (US);  
**Paul Shieh**, Westborough, MA (US)

(Continued)

FOREIGN PATENT DOCUMENTS

EP 0 650 284 4/1995

(Continued)

OTHER PUBLICATIONS

Schulzrinne, H. "The Session Initiation Protocol," [http://www.cs.columbia.edu/~ucoms6181/slides/11/sip\\_long/.pdf](http://www.cs.columbia.edu/~ucoms6181/slides/11/sip_long/.pdf), May 2001.

(Continued)

(73) Assignee: **Starent Networks, Corp.**, Tewksbury, MA (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.

*Primary Examiner*—Joseph Feild  
*Assistant Examiner*—Inder Pal Mehra  
(74) *Attorney, Agent, or Firm*—Wilmer Cutler Pickering Hale and Dorr LLP

(21) Appl. No.: **10/210,897**

(57) **ABSTRACT**

(22) Filed: **Aug. 1, 2002**

(65) **Prior Publication Data**

US 2004/0022208 A1 Feb. 5, 2004

(51) **Int. Cl.**  
**H04Q 7/00** (2006.01)

(52) **U.S. Cl.** ..... **370/328**; 370/349; 370/356;  
370/389; 370/401; 455/517

(58) **Field of Classification Search** ..... 370/312,  
370/328, 335, 342, 352–353, 355, 356, 432,  
370/441, 466, 349, 390, 401, 338, 389; 455/524,  
455/542, 560, 404.1, 412.1, 412.2, 414.1,  
455/517, 520; 705/26, 27; 379/88.01, 88.03,  
379/88.04, 88.16, 265.01, 265.02; 709/207,  
709/231, 238

See application file for complete search history.

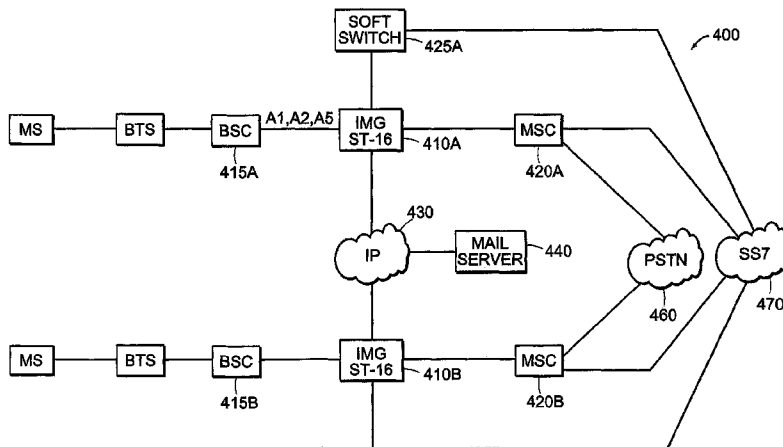
Advanced communications features are provided in a mobile communications network having at least one mobile switching center and at least one mobile station subsystem. The mobile switching center and mobile station subsystem each communicate signaling messages according to a mobile signaling protocol. An indication is received that a half-duplex mobile communications session is to be initiated between a first mobile station subsystem and a second mobile station subsystem. The first and second mobile station subsystems include full-duplex communications apparatus for use in full-duplex mobile communications sessions. The half-duplex mobile communications session relies on the first and second mobile station subsystems, and all of the reliance is only on the full-duplex communications apparatus. Mobile communications telephone calls are established with the first mobile station subsystem and the second mobile station subsystem. One of the first and second mobile station subsystems is selected as a voice signal source in the half-duplex communications session.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,677,656 A \* 6/1987 Burke et al. .... 455/403  
5,513,181 A \* 4/1996 Bresalier et al. .... 370/465

**27 Claims, 13 Drawing Sheets**



U.S. PATENT DOCUMENTS

6,112,083	A *	8/2000	Sweet et al. ....	455/426.1
6,128,509	A *	10/2000	Vejjola et al. ....	455/556.1
6,131,121	A *	10/2000	Mattaway et al. ....	709/227
6,298,058	B1 *	10/2001	Maier et al. ....	370/390
6,366,782	B1 *	4/2002	Fumarolo et al. ....	455/457
6,400,967	B1 *	6/2002	Nilsson .....	455/563
6,449,496	B1 *	9/2002	Beith et al. ....	455/563
6,477,150	B1 *	11/2002	Maggenti et al. ....	370/312
6,570,871	B1 *	5/2003	Schneider .....	370/356
6,606,305	B1 *	8/2003	Boyle et al. ....	370/260
6,754,180	B1 *	6/2004	Christie .....	370/236
7,058,036	B1 *	6/2006	Yu et al. ....	370/335
2001/0046234	A1	11/2001	Agrawal et al.	
2002/0075805	A1	6/2002	Gupta et al.	
2002/0075814	A1	6/2002	Desai et al.	
2002/0075875	A1	6/2002	Dravida et al.	
2002/0077136	A1	6/2002	Maggenti et al.	
2002/0078464	A1	6/2002	Dravida et al.	
2002/0085552	A1	7/2002	Tandon	
2002/0085589	A1	7/2002	Dravida et al.	
2002/0086665	A1	7/2002	Maggenti et al.	
2003/0017836	A1 *	1/2003	Vishwanathan et al. ....	455/517
2003/0063590	A1 *	4/2003	Mohan et al. ....	370/338
2003/0088421	A1 *	5/2003	Maes et al.	
2003/0128696	A1 *	7/2003	Wengrovitz et al. ....	370/352

2003/0156688	A1 *	8/2003	McCarty et al. ....	379/67.1
2003/0185202	A1 *	10/2003	Maenpaa .....	370/352
2005/0286689	A1 *	12/2005	Vuori .....	379/88.22
2006/0002358	A1	1/2006	Ray et al.	
2006/0140151	A1 *	6/2006	Dantu et al. ....	370/331

FOREIGN PATENT DOCUMENTS

EP	0 845 894	6/1998
WO	WO-98/47298 A2	10/1998
WO	WO-00/22792 A2	4/2000
WO	WO 01/45335	6/2000
WO	WO 00/47005	8/2000
WO	WO 00/57601	9/2000
WO	WO 00/79826 A1	12/2000
WO	WO-01/31939 A2	5/2001
WO	WO 01/56236	8/2001
WO	WO-01/76276 A2	10/2001
WO	WO 02/30010	4/2002
WO	WO-02/45440 A1	6/2002
WO	WO-02/054707 A2	7/2002

OTHER PUBLICATIONS

Handley, M. et al., "SIP Session Initiation Protocol," <http://tools.ietf.org/html/rfc2543>, Mar. 1999.

\* cited by examiner

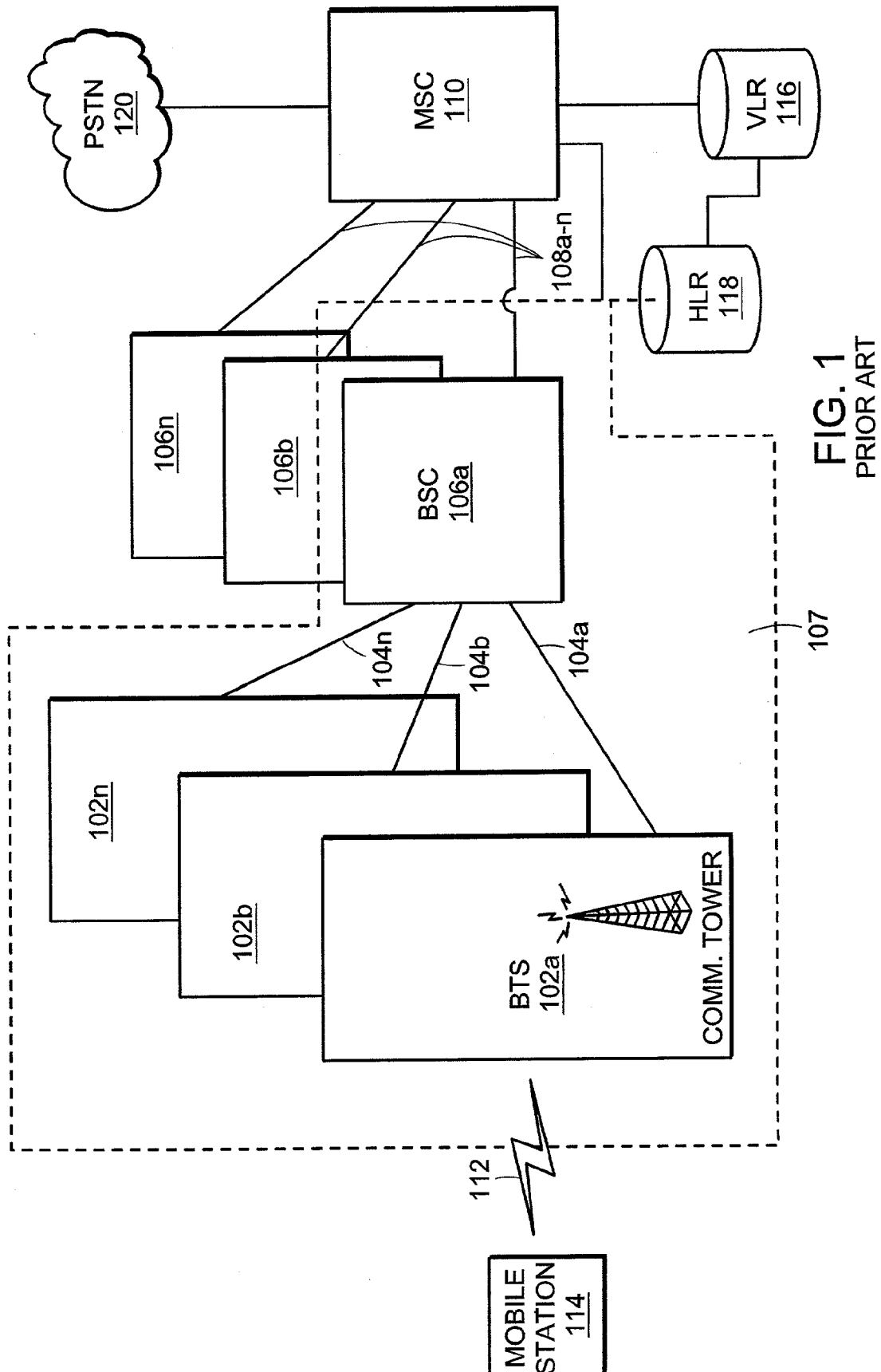


FIG. 1  
PRIOR ART

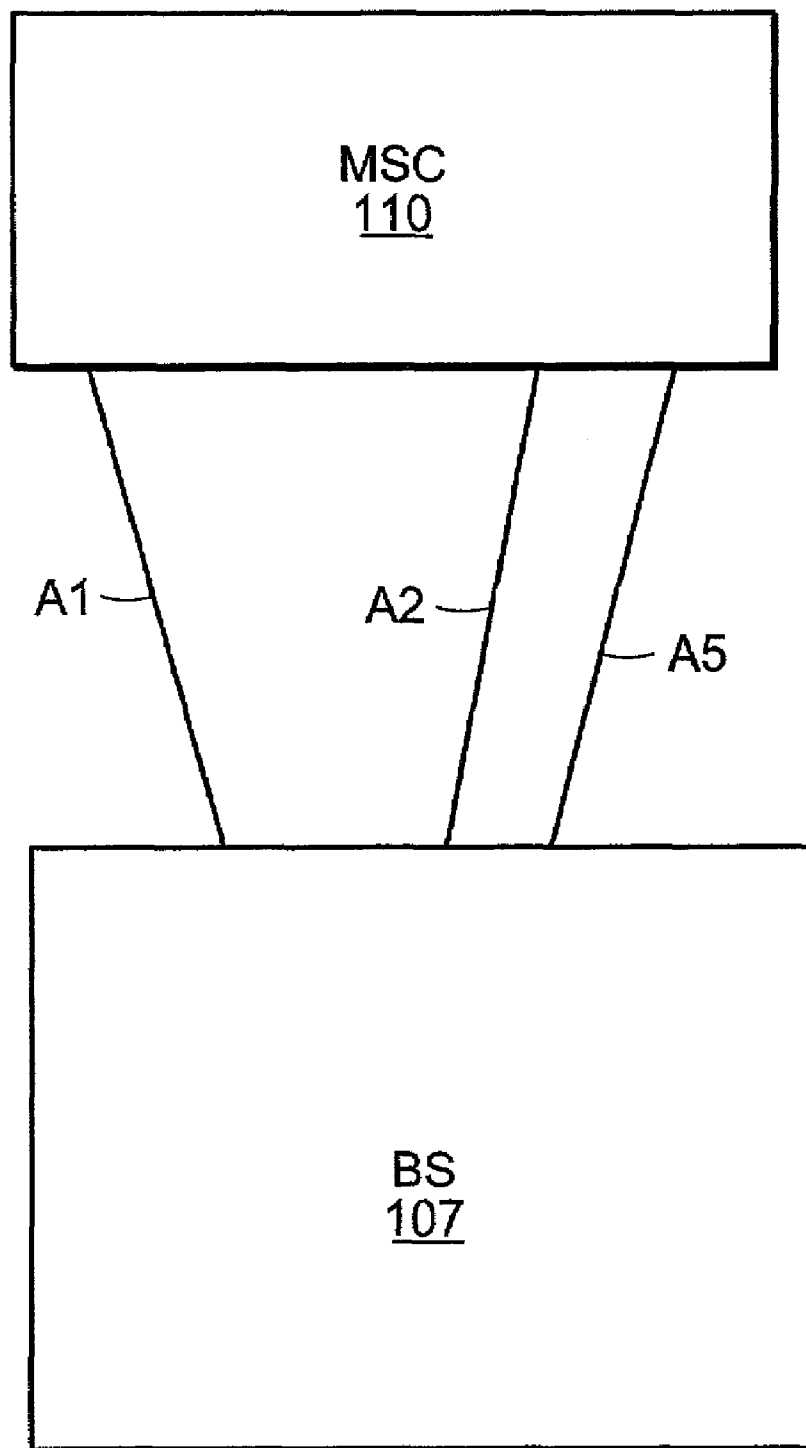


FIG. 2  
PRIOR ART

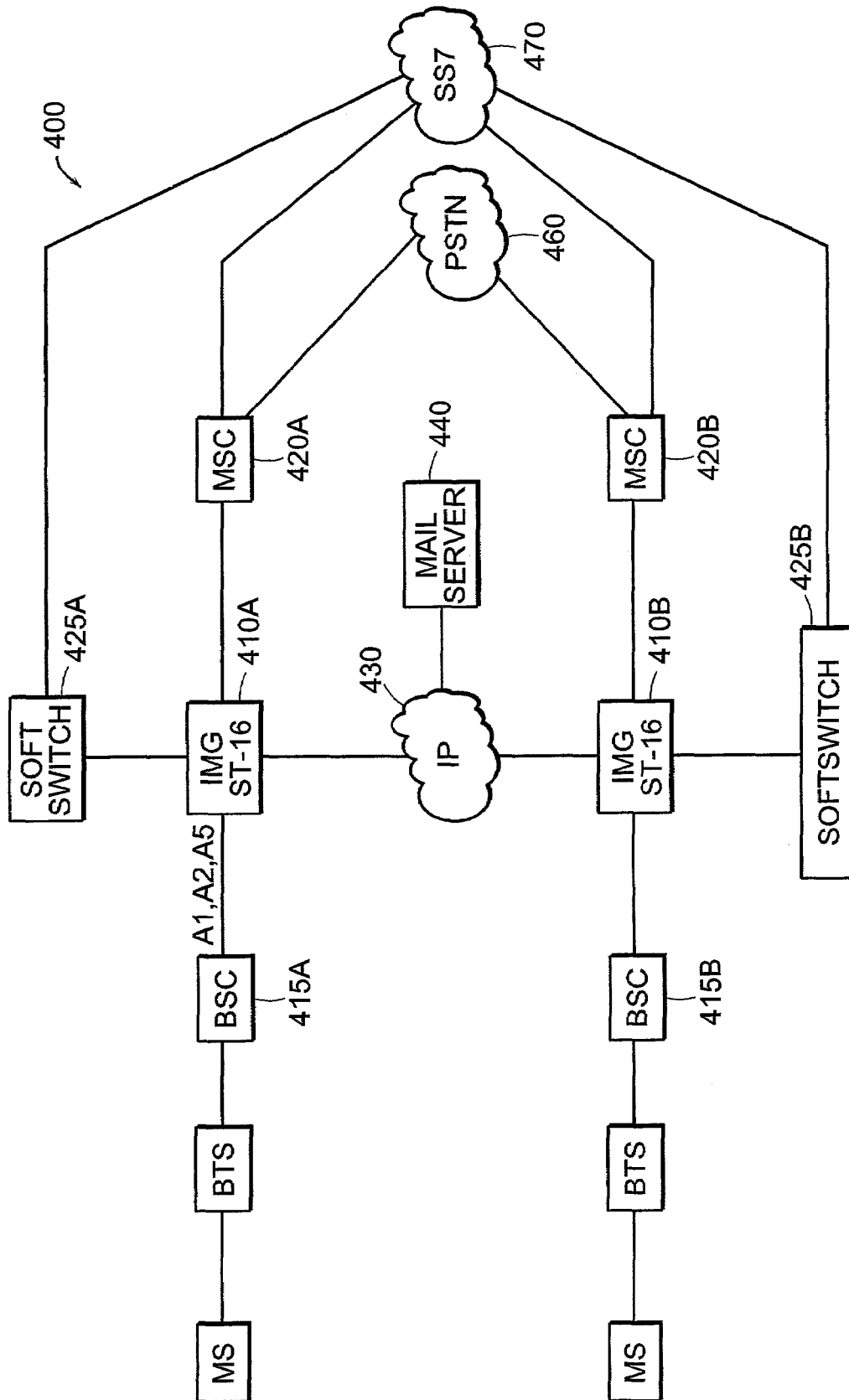


FIG. 3A

# 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.