

IPR2023-01416
U.S. Patent No. 6,947,477
Petitioners' Oral Argument Slides

January 14, 2025

Table of Contents

1	Summary of the Disputes
2	Claim Interpretation
3	Ground 1 - Genossar (Claims 1, 3-5, 8-9, 13, 15-17 and 19-20)
4	Ground 3 and 4 - Barratt '470 (Claims 1, 3-6, 8-10, 13, 15-17, and 19-20)
	Barratt '470 in view of Barrat '490 (Claims 7, 11, 12)
5	Ground 5 - Barratt '470 in view of PHS (Claims 2, 14, and 18)
6	Ground 2 - Genossar in view of WiMAX (Claims 2, 10-12, 14, and 18)
7	Overview of the '477 Patent

Summary of the Disputes

ERICSSON  T-Mobile NOKIA

Non-Disputed Issues

Claims 16-17, 19-20 are anticipated by Genossar (Ground 1, Paper 1 p. 26-27)

Claims 16-17, 19-20 are anticipated by Barratt '470 (Ground 3, Paper 1 p. 58-59)

Q. Now, you said you were asked to opine on certain claims in the '477 patent. Am I correct that you did not opine on all of the claims in the '477 patent in these proceedings?

A. **Yes. I was asked to opine on certain set of claims, which are Claims 1 through 15 and Claim 18.**

Q. So fair to say you're not offering an opinion in this proceeding on Claims 16, 17, 19, or 20. Right?

A. **Yes, that's right.**

EX1038 (Madisetti Dep.) at 8:6-16

Summary of Disputes

- 1 Genossar anticipates “a profile parameter storage device **coupled to** said profile parameter determiner” (Grounds 1 and 2)
- 2 Genossar anticipates “said **profile parameter storage device** for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 1 and 2)
- 3 Barratt '470 anticipates “a profile parameter storage device **coupled to** said profile parameter determiner” (Grounds 3, 4, and 5)
- 4 Barratt '470 anticipates “said **profile parameter storage device** for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 3, 4, and 5)
- 5 Barratt '470 discloses channel-related parameters (Grounds 3, 4, and 5)
- 6 Barratt '470 and PHS render obvious challenged claim 18 (Ground 5)
- 7 WiMAX is publicly available prior art (Ground 2)

'477 Patent | “coupled to”

1.pre	Profile-creating apparatus for creating at least a first profile associated with transmission upon at least a first channel of at least a first burst-data signal transmitted in bursts to a receiving station, said profile-creating apparatus comprising:
1.A	a profile parameter determiner coupled to receive an indication of an initial burst of the first burst data signal transmitted upon the first channel to the receiving station,
1.B	said profile parameter determiner for determining a value of at least one signal-related parameter and at least one channel-related parameter, wherein the signal-related and channel-related parameters are collectively representative of communication of the first burst data signal over the first channel to the receiving station; and
1.C	a profile parameter storage device coupled to said profile parameter determiner , said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter determined by said profile parameter determiner,
1.D	the values stored at said profile parameter storage device to be used to facilitate receive operations performed at the receiving station on subsequent bursts of the first burst data signal.

Petitioner's Position

Plain and ordinary – joined or connected in any way

Paper 1, p. 6, Paper 24, pp. 3-10

Patent Owner's Position

Plain and ordinary – requiring two separate and distinct components

Paper 21, p. 2

Dr. Madisetti Did Not Apply The Agreed Construction

9 Q My question was a little bit different.

10 In forming your opinions in this
11 declaration, you did not apply the construction
12 of -- for the phrase "coupled to" as meaning
13 joined or connected to in any way. Correct?

14 MS. SPIRES: Object to form.

15 A As I said, Counsel, I'm not seeing such a
16 construction from any party or any side. All I've
17 said is that my opinions apply to the -- my
18 opinions said that the petitioner did not identify
19 the two structures, nor showed that they were
20 coupled in any way or any -- any such
21 identification of how the petitioner understood in
22 an adequate manner that they were coupled to the
1 extent they were described.

EX1038, Madisetti Deposition 26:9-27:1, Paper 24, p. 9

'477 Patent | "coupled to"



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

(10) Patent No.: **US 6,947,477 B2**
(45) Date of Patent: **Sep. 20, 2005**

(54) **APPARATUS AND METHOD FOR CREATING SIGNAL AND PROFILES AT A RECEIVING STATION**

(52) U.S. CL. 375/222; 375/224
(58) Field of Search 375/222; 370/314; 370/321; 347

(75) Inventors: **Paul F. Strubbsaker**, Plano, TX (US);
Russell C. McKawa, Richardson, TX (US)

(56) References Cited
U.S. PATENT DOCUMENTS

(73) Assignee: **Raze Technologies, Inc.**, Plano, TX (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 156(b) by 000 days.

(21) Appl. No. **09/839,719**
(22) Filed: **Apr. 20, 2001**

5,793,753 A * 8/1998 Hensley et al. 455/15
5,832,365 A * 11/1998 Chen et al. 455/15
5,978,600 A * 11/1999 Fischer et al. 455/14
6,222,858 B1 * 4/2001 Constantine 370/474
6,230,326 B1 * 5/2001 Unger et al. 725/111
6,320,903 B1 * 11/2001 Jakson et al. 375/232
6,345,071 B1 * 2/2002 Hand 375/222
6,590,872 B1 * 7/2003 Shue et al. 370/314
6,586,490 B1 * 10/2003 Johnson 370/328
6,654,384 B1 * 11/2003 Reza et al. 370/469
2003/002495 A1 * 1/2003 Shahr et al. 370/389

(65) **Prior Publication Data**
US 2002/0097685 A1 Jul. 25, 2002

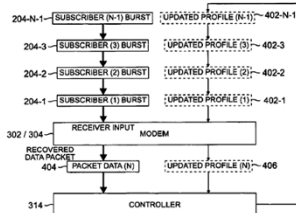
FOREIGN PATENT DOCUMENTS
EP 0 800 285 A2 10/1997
WO 96/04481 10/1996
WO 99/03837 6/1999

Related U.S. Application Data

(60) Provisional application No. 60/262,527, filed on Jan. 19, 2001, provisional application No. 60/262,712, filed on Jan. 19, 2001, provisional application No. 60/262,825, filed on Jan. 19, 2001, provisional application No. 60/262,698, filed on Jan. 19, 2001, provisional application No. 60/262,825, filed on Jan. 19, 2001, provisional application No. 60/262,951, filed on Jan. 19, 2001, provisional application No. 60/262,524, filed on Jan. 19, 2001, provisional application No. 60/263,101, filed on Jan. 19, 2001, provisional application No. 60/263,097, filed on Jan. 19, 2001, provisional application No. 60/263,101, filed on Jan. 19, 2001, provisional application No. 60/273,579, filed on Mar. 5, 2001, provisional application No. 60/262,555, filed on Jan. 19, 2001, provisional application No. 60/262,708, filed on Jan. 19, 2001, provisional application No. 60/273,680, filed on Mar. 5, 2001, provisional application No. 60/273,757, filed on Mar. 5, 2001, provisional application No. 60/270,578, filed on Feb. 21, 2001, and provisional application No. 60/270,450, filed on Feb. 21, 2001.

(51) Int. Cl. H04B 1/38; H04L 5/16

20 Claims, 5 Drawing Sheets



- 1.A** a profile parameter determiner **coupled to** receive an indication of an initial burst of the first burst data signal transmitted upon the first channel to the receiving station,
- 1.B** said **profile parameter determiner for determining a value of at least one signal-related parameter and at least one channel-related parameter**, wherein the signal-related and channel-related parameters are collectively representative of communication of the first burst data signal over the first channel to the receiving station; and

Modem **302** and modem **304** are selectively coupled to receive uplink signals sent by different ones of subscriber stations to the base station (not shown). Here, IF/RF

'477 Patent 9:65-10:2

304. Thereafter, the down-converted signals, bursts sub**3** . . . sub**1** and bursts subN . . . sub**2** are operated upon by modems **304** and **302** respectively. The modems are shown to be functionally coupled to controller **316** via lines **310**, for receiving contention results, and **312** for passing parameters, frame times and weight values for the modems to apply to the received signals. Controller **314** includes control CPU **316** and memory device **318**.

'477 Patent 10:7-14
Paper 24, p. 5

'477 Patent | “coupled to”



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

(10) Patent No.: US 6,947,477 B2
(45) Date of Patent: Sep. 20, 2005

(54) APPARATUS AND METHOD FOR CREATING
SIGNAL AND PROFILES AT A RECEIVING
STATION

(52) U.S. CL 375/222; 375/224

(58) Field of Search 375/222; 370/314,
370/321, 347

(75) Inventors: Paul F. Struhsaker, Plano, TX (US); Russell C. McKown, Richardson, TX (US)	(56) References Cited U.S. PATENT DOCUMENTS
--	--

(73)	Assignee: Raze Technologies, Inc., Plano, TX	5,793,753 A	8/1998	Hershey et al.	
	(US)	5,832,365 A	* 11/1998	Chen et al.	455/15
		5,978,650 A	11/1999	Fischer et al.	455/3

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 801 days.

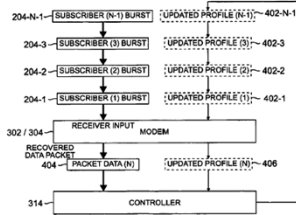
(21)	Appl. No.: 09/839,719	6,636,490 B1 * 10/2003	Johnson	370/328
		6,654,384 B1 * 11/2003	Reza et al.	370/469
(22)	Filed: Apr. 20, 2001	2003/0002495 A1 * 1/2003	Shahar et al.	370/389

(65) Prior Publication Data		FOREIGN PATENT DOCUMENTS	
US 2002/0097685 A1 Jul. 25, 2002	EP	0 800 285 A2	10/1997
	WO	WO/96/01481	10/1996

Related U.S. Application Data		WO	WO 99/31837	6/1999
(60)	Provisional application No. 60/262,827, filed on Jan. 19, 2001, provisional application No. 60/262,712, filed on Jan. 10, 2001, provisional application No. 60/263,826, filed on	* cited by examiner		

[illegible](51) Int. Cl.⁷ H04B 1/38; H04L 5/16 20 Claims, 5 Drawing Sheets

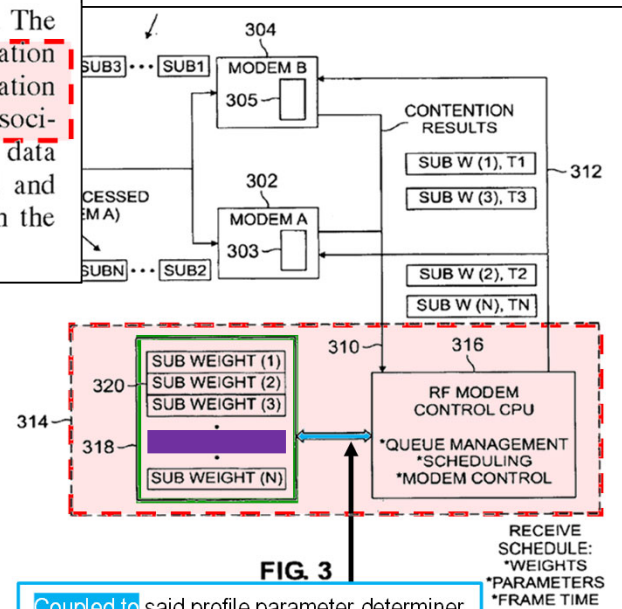
20 Claims, 5 Drawing Sheets



1.A a profile parameter determiner coupled to receive an indication of an initial burst of the first burst data signal transmitted upon the first channel to the receiving station,

1.B said profile parameter determiner for determining a value of at least one signal-related parameter and at least one channel-related parameter, wherein the signal-related and channel-related parameters are collectively representative of communication of the first burst data signal over the first channel to the receiving station; and

forming part of the receive portion of the base station. The modems are controlled by a controller, such as a base station central processing unit (CPU), to control demodulation operations thereat. The controller maintains profiles associated with the channels wherein separate ones of the data bursts are communicated. The profiles are retrieved and values of the elements of such profiles are utilized in the demodulation of the respective data bursts.



'477 Patent Fig. 3 Annotated

'477 Patent | “coupled to”

- Q. And so my question is, if “couple to” requires the two different component to be separate and distinct, in your view can the profile storage device be a subcomponent of the profile parameter determiner?
- A. **I don't have an opinion on that issue. I have to rely on what my declaration would say, is that the petitioner did not identify what the prior art that it relied upon was, the alleged profile parameter storage device or the profile parameter determiner, nor did they identify what these different and distinct components or structures were, nor did they show how they were coupled to. So that was my opinion where I agreed with the board.**

EX1038, Madisetti Deposition 16:15-17:7; Paper 24, pp. 8-9

'477 Patent | “storage device for storing values”

1.pre	Profile-creating apparatus for creating at least a first profile associated with transmission upon at least a first channel of at least a first burst-data signal transmitted in bursts to a receiving station, said profile-creating apparatus comprising:
1.A	a profile parameter determiner coupled to receive an indication of an initial burst of the first burst data signal transmitted upon the first channel to the receiving station,
1.B	said profile parameter determiner for determining a value of at least one signal-related parameter and at least one channel-related parameter, wherein the signal-related and channel-related parameters are collectively representative of communication of the first burst data signal over the first channel to the receiving station; and
1.C	a profile parameter storage device coupled to said profile parameter determiner, said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter determined by said profile parameter determiner,
1.D	the values stored at said profile parameter storage device to be used to facilitate receive operations performed at the receiving station on subsequent bursts of the first burst data signal.

Petitioner's Position



a storage device, which may comprise multiple memory components

Paper 1, p. 6, Paper 24, pp. 10-11

Patent Owner's Position at the District Court



a storage device, which may comprise multiple memory components

Paper 24, p. 11

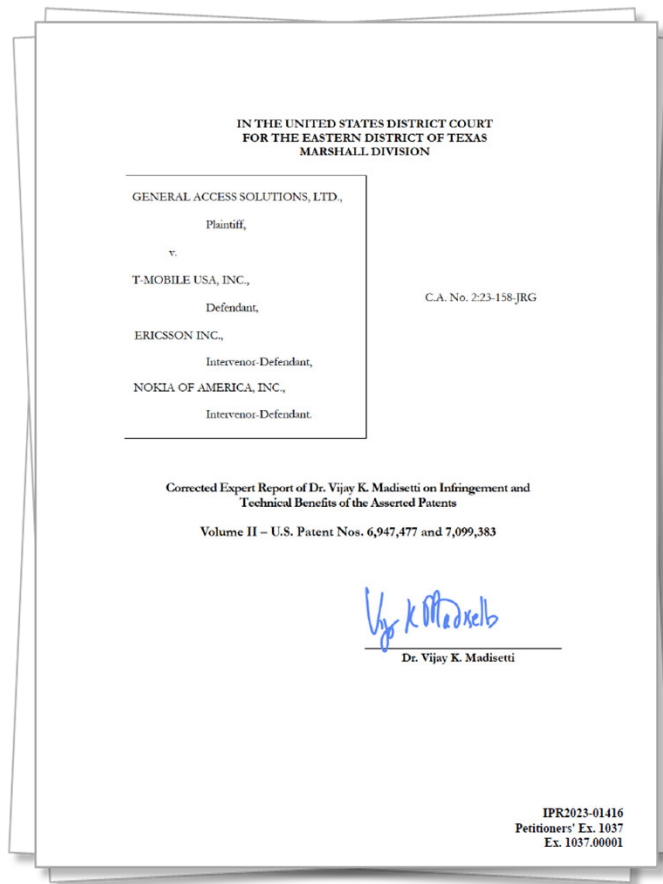
Patent Owner's Position in IPR



A single device that stores both alleged parameters

Paper 21, p. 2

'477 Patent | “storage device for storing values”



1.C a profile parameter storage device coupled to said profile parameter determiner, said profile parameter storage **device for storing values** representative of the at least one signal-related parameter and the at least one channel-related parameter determined by said profile parameter determiner,

2. Separate Storage of Signal and Channel Related Parameters

373. T-Mobile may assert that, in some cases, it stores values associated with signal and/or channel related parameters in separate memories and that its base stations therefore do not include the claimed profile parameter storage device. As discussed above in the context of the potential non-infringing alternatives, the claimed “profile parameter storage device,” may include more than one component. Indeed, it is common for storage devices to comprise multiple memory components (e.g., hard disk drives that contain multiple NAND chips; SoCs with multiple memory portions, etc.). To the extent that T-Mobile’s base stations store UE data on multiple memories, those memories are part of the same “device.”

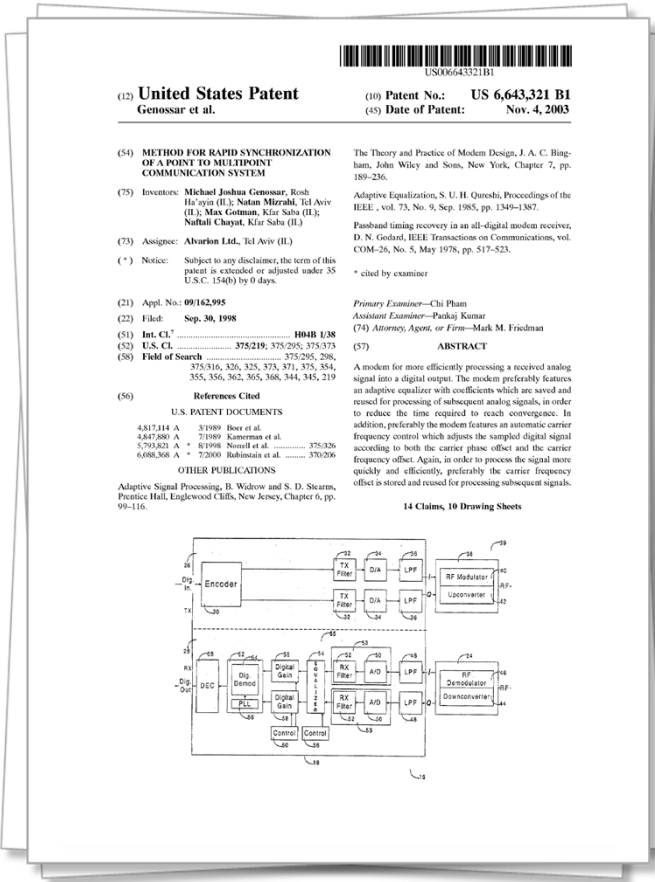
Madiseti District Court Infringement Report, Para. 373; Paper 24, p. 11-12

Ground 1 – Genossar

(Claims 1, 3-5, 8-9, 13, 15-17, and 19-20)

ERICSSON  T-Mobile NOKIA

Genossar | U.S. Patent No. 6,643,321



(54) **METHOD FOR RAPID SYNCHRONIZATION OF A POINT TO MULTIPOINT COMMUNICATION SYSTEM**

(75) Inventors: **Michael Joshua Genossar**, Rosh Ha'ayin (IL); **Natan Mizrahi**, Tel Aviv (IL); **Max Gotman**, Kfar Saba (IL); **Naftali Chayat**, Kfar Saba (IL)

(73) Assignee: **Alvarion Ltd.**, Tel Aviv (IL)

(*) 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.: **09/162,995**

(22) Filed: **Sep. 30, 1998**

(51) Int. Cl.⁷ **H04B 1/38**

(52) U.S. Cl. **375/219; 375/295; 375/373**

(58) Field of Search **375/295, 298, 375/316, 326, 325, 373, 371, 375, 354, 355, 356, 362, 365, 368, 344, 345, 219**

Genossar, cover; Paper 1, p. 2

Summary of Disputes

- 1 Genossar anticipates “a profile parameter storage device **coupled to** said profile parameter determiner” (Grounds 1 and 2)
- 2 Genossar anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 1 and 2)
- 3 Barratt '470 anticipates “a profile parameter storage device coupled to said profile parameter determiner” (Grounds 3, 4, and 5)
- 4 Barratt '470 anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 3, 4, and 5)
- 5 Barratt '470 discloses channel-related parameters (Grounds 3, 4, and 5)
- 6 Barratt '470 and PHS render obvious challenged claim 18 (Ground 5)
- 7 WiMAX is publicly available prior art (Ground 2)

Genossar | Discloses a Profile Parameter Storage Device Coupled to Said Profile Parameter Determiner

(12) United States Patent Genossar et al.

(10) Patent No.: US 6,643,321 B1
(45) Date of Patent: Nov. 4, 2003

(54) METHOD FOR RAPID SYNCHRONIZATION OF A POINT TO MULTIPoint COMMUNICATION SYSTEM

(75) Inventors: Michael Joshua Genossar, Rosh
Ha'ayin (IL); Natan Mirzahi, Tel Aviv
(IL); Max Gotsman, Kfar Saba (IL);
Nofal Chayot, Kfar Saba (IL)

(73) Assignee: Alvarion Ltd., Tel Aviv (IL)

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

The Theory and Practice of Modern Design, J. A. C. Bingham, John Wiley and Sons, New York, Chapter 7, pp. 189-226.

Adaptive Equalization, S. U. H. Qureshi, Proceedings of the
IEEE, vol. 73, No. 9, Sep. 1985, pp. 1349-1367.

Fastband timing recovery in an all-digital modem receiver,
D. N. Godard, IEEE Transactions on Communications, vol.
COM-26, No. 5, May 1978, pp. 517-523.

* cited by examiner

(21) Appl. No.: 09/162,995

(22) Filed: Sep. 30, 1998

(51) Int. Cl. H04B 1/38

(52) U.S. Cl. 375/219; 375/295; 375/373

(58) Field of Search 375/316, 326, 325, 373, 371, 375, 354,

355, 356, 362, 365, 368, 344, 345, 219

(56) References Cited

U.S. PATENT DOCUMENTS

4,817,114 A 3/1989 Boer et al.

4,847,880 A 7/1989 Kamenman et al.

5,703,821 A 8/1998 Nouel et al.

6,088,368 A 7/2000 Rabinovitch et al.

OTHER PUBLICATIONS

Adaptive Signal Processing, B. Widrow and S. D. Stearns,
Prentice Hall, Englewood Cliffs, New Jersey, Chapter 6, pp.
99-116.

Primary Examiner—Chi Pham

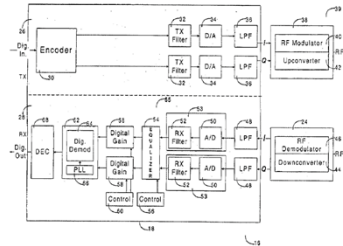
Assistant Examiner—Padmak Kumar

(74) Attorney, Agent, or Firm—Mark M. Friedman

(57) ABSTRACT

A modem for more efficiently processing a received analog
signal into a digital output. The modem preferably features
an adaptive equalizer with coefficients which are saved and
reused for processing of subsequent analog signals, in order
to reduce the time required to reach convergence. In
addition, preferably the modem features an automatic carrier
frequency control which adjusts the sampled digital signal
according to both the carrier phase offset and the carrier
frequency offset. Again, in order to process the signal more
quickly and efficiently, preferably the carrier frequency
offset is stored and reused for processing subsequent signals.

14 Claims, 10 Drawing Sheets



procedure. Second, the carrier frequency offset of PLL 66 is initialized to the previously stored value, as shown with reference to FIGS. 5A and 5B.

Genossar, 13:43-45

By contrast, equalizer controller 56 of the present invention stores the values for the equalizer coefficients and then reuses these values as an initial estimate when a new signal is received. In particular, for fixed applications in which

Genossar, 11:28-31

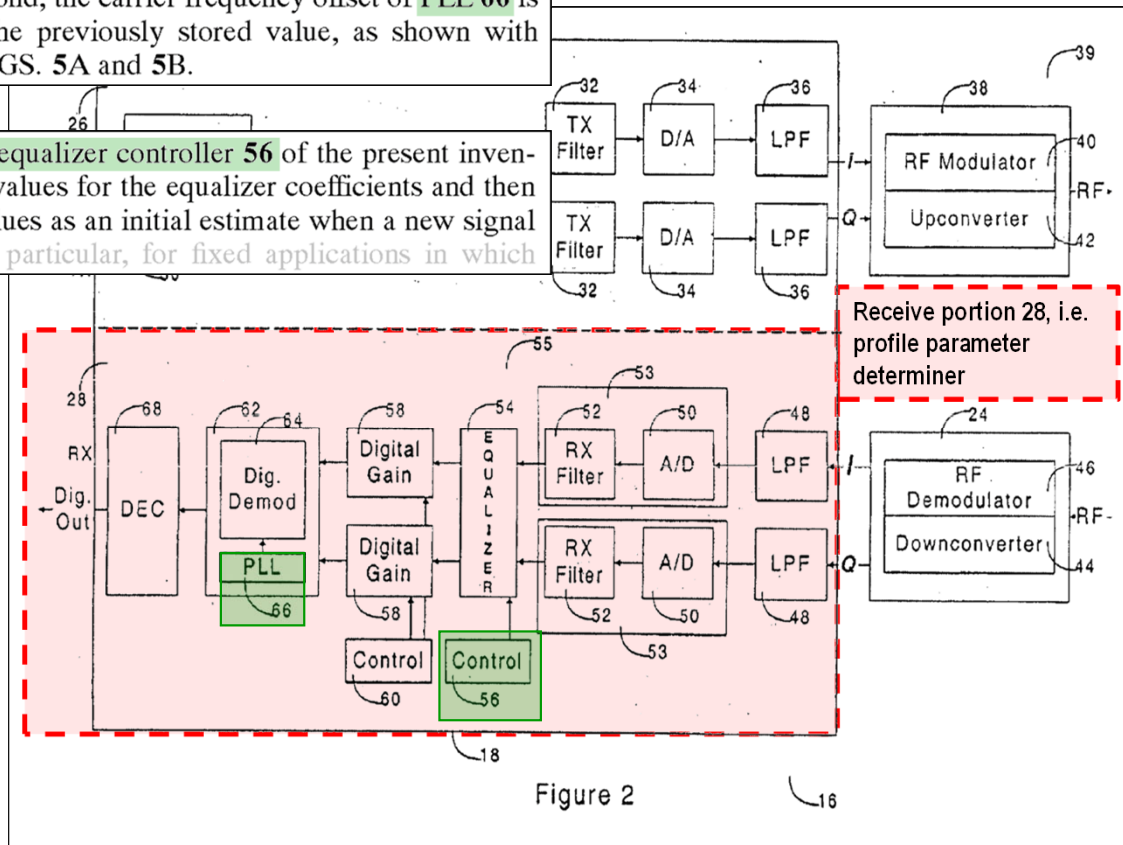


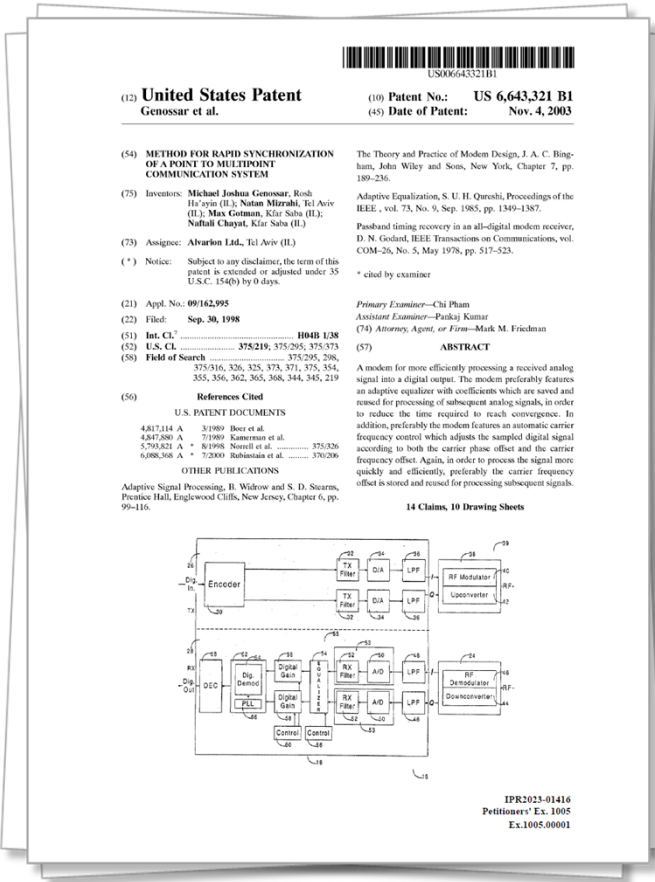
Figure 2

Genossar, Fig. 2; Paper 1, pp. 16-18, 20, Paper 24, pp. 13-14

Summary of Disputes

- 1 Genossar anticipates “a profile parameter storage device coupled to said profile parameter determiner” (Grounds 1 and 2)
- 2 Genossar anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 1 and 2)
- 3 Barratt '470 anticipates “a profile parameter storage device coupled to said profile parameter determiner” (Grounds 3, 4, and 5)
- 4 Barratt '470 anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 3, 4, and 5)
- 5 Barratt '470 discloses channel-related parameters (Grounds 3, 4, and 5)
- 6 Barratt '470 and PHS render obvious challenged claim 18 (Ground 5)
- 7 WiMAX is publicly available prior art (Ground 2)

Genossar | Discloses a Profile Parameter Storage Device For Storing Values Representative of the At Least One Signal-Related Parameter and the At Least One Channel-Related Parameter



Genossar parameter	Corresponding '477 parameter type	Genossar profile parameter storage device
carrier frequency offset	signal-related parameter	PLL [phase locked loop] 66. Genossar 11:61-65, 13:37-45
equalizer coefficients	channel-related parameters	in combination with Equalizer controller 56. Genossar 11:26-30, 11:38-40, 13:37-45

Paper 1, p., 20, Paper 24, p. 18

Genossar | No Dispute | Discloses Both Channel-Related and Signal-Related Parameters

'477 PATENT

which the burst was transmitted. The parameters include, for instance, signal-related parameters and channel-related parameters. Signal-related parameters include, for instance, the amount of forward error correction (FEC) of the burst, change in frequency of the burst, changes in time of the burst, changes in power levels of the burst, etc. And, channel-related parameters include values of equalization weighting, antenna parameters, either at the subscriber station or at the base station, etc. The calculated parameters are

'477 Patent at 11:56-64; Paper 1, p. 7

The profiles further selectably include other parameters, such as the modulation index of the data signals communicated by the subscriber stations to the base station, the modulation orthogonalizations of the bursts of data signals of the bursts of data signals, parameters associated with FEC (forward error correction) of the data bursts sent to the base station by the subscriber stations, antenna combining parameters when antenna diversity and/or beamforming is utilized, timing adjustment parameters, as well as other values.

477 Patent 6:10-18

SIGNAL-RELATED PARAMETERS

CHANNEL-RELATED PARAMETERS

GENOSSAR

burst. The frequencies by which the signal is modulated, upconverted, downconverted and demodulated will have some deviation from their ideal values. The sum of all these deviations is the carrier frequency offset.

Genossar at 17:44-47; Paper 1, p. 18

FIG. 3A shows the structure of a preferred feedforward equalizer 54. Equalizer 54 could also optionally be a decision feedback equalizer (DFE). Equalizer 54 features a plurality of delay elements 68 and a plurality of coefficients 70. Each arrow represents a complex number, although for the sake of simplicity, single lines are used to represent both components of such a number. An input signal 72 is fed to delay elements 68. Input signal 72 and delayed values 73 of input signal 72 are then multiplied by multipliers 70 by complex valued equalizer coefficients 71, illustrated as coefficients 71 C1 through C8. The number of equalizer coefficients 71 could clearly be larger or smaller than the seven coefficients 71 shown for the purposes of illustration only, without intending to be limiting in any way. Outputs 74 of multipliers 70 are then fed to a summer 76.

Genossar at 12:19-33; Paper 1, pp. 18-19

Genossar | Discloses a Profile Parameter Storage Device For Storing Values Representative of the At Least One Signal-Related Parameter and the At Least One Channel-Related Parameter

US00643321 B1

United States Patent

Genossar et al.

(12)

(10) Patent No.: US 6,643,321 B1

(45) Date of Patent: Nov. 4, 2003

(54) METHOD FOR RAPID SYNCHRONIZATION OF A POINT TO POINT COMMUNICATION SYSTEM

(75) Inventors: Michael Joshua Genossar, Roni Hatzay (IL); Natan Mirzahi, El Aviv (IL); Max Gottman, Kfir Saba (IL); Nofali Chayot, Kfir Saba (IL)

(73) Assignee: Alvarion Ltd., Tel Aviv (IL)

(*) 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.: 09/162,995

(22) Filed: Sep. 30, 1998

(51) Int. Cl.⁷: H04B 1/38

(52) U.S. Cl.: 375/219; 375/295; 375/373

(56) Field of Search: 375/316, 326, 325, 373, 371, 375, 354, 355, 356, 362, 365, 368, 344, 345, 219

(56) References Cited

U.S. PATENT DOCUMENTS

4,817,114 A 3/1989 Boer et al.

4,847,880 A 7/1989 Kamenman et al.

5,703,821 A 8/1998 Nouel et al.

6,088,368 A 7/2000 Raboinaia et al.

OTHER PUBLICATIONS

Adaptive Signal Processing, B. Widrow and S. D. Stearns, Prentice Hall, Englewood Cliffs, New Jersey, Chapter 6, pp. 99-116.

The Theory and Practice of Modem Design, J. A. C. Bingham, John Wiley and Sons, New York, Chapter 7, pp. 189-226.

Adaptive Equalization, S. U. H. Qureshi, Proceedings of the IEEE, vol. 73, No. 9, Sep. 1985, pp. 1349-1367.

Passband timing recovery in an all-digital modem receiver, D. N. Godard, IEEE Transactions on Communications, vol. COM-26, No. 5, May 1978, pp. 517-523.

(*) cited by examiner

Primary Examiner—Chi Pham

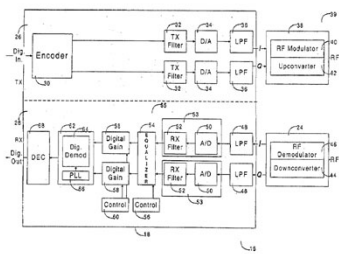
Assistant Examiner—Padmak Kumar

(74) Attorney, Agent, or Firm—Mark M. Friedman

(57) ABSTRACT

A modem for more efficiently processing a received analog signal into a digital output. The modem preferably features an adaptive equalizer with coefficients which are saved and reused for processing of subsequent analog signals, in order to reduce the time required to reach convergence. In addition, preferably the modem features an automatic carrier frequency control which adjusts the sampled digital signal according to both the carrier phase offset and the carrier frequency offset. Again, in order to process the signal more quickly and efficiently, preferably the carrier frequency offset is stored and reused for processing subsequent signals.

14 Claims, 10 Drawing Sheets



CHANNEL-RELATED PARAMETERS

expected to change rapidly. Furthermore, for base station modem 18 an additional efficiency is realized, since the equalizer coefficients are expected to differ between transmissions from different terminal station modems 22, such that the equalizer coefficients can be stored for each terminal station 14 separately, and then reused when that terminal station 14 is transmitting again. Thus, reusing these values enables equalizer 54 to begin processing at a point which is much closer to convergence than simply starting at any arbitrary value.

Genossar, 11:38-40

The steps of the method for every burst are as follows. First, before the synchronization portion of the burst is processed, coefficients 71 of equalizer 54 are initialized to previously stored values from equalizer controller 56, which includes some type of writable memory for storing these values, according to an initialized coefficient adjustment procedure. Second, the carrier frequency offset of PLL 66 is initialized to the previously stored value, as shown with reference to FIGS. 5A and 5B.

Genossar, 13:37-45

SIGNAL-RELATED PARAMETERS

quickly. By contrast, as shown below in more detail with reference to FIGS. 5A and 5B, PLL 66 at base station modem 18 does store and reuse the values for carrier frequency offset, such that the process of convergence at the beginning of a burst is able to occur much more quickly.

Genossar, 11:61-65

The overall operation of AFC 62 is as follows. During processing of the start of the header, the value of frequency register 130 is loaded from stored memory, where the calculated value of this frequency register for this particular terminal station was stored during a previous burst, and phase register 138 is set to an arbitrary value, preferably zero. Next, during processing of the header, carrier phase error detector 114 is not operative. The input to loop filter 116 is therefore zero at all times, and integrator 132 produces only fixed values. At the end of the header, the carrier phase offset is estimated and the value stored in phase register 138 is corrected accordingly. For the remainder of the burst, carrier phase error detector 114 operates. At the end of the burst, frequency register 130 stores the last calculated value of frequency register 130 until the next burst transmission from this particular terminal station.

Genossar, 18:52-67

Demonstrative Exhibit – Not Evidence

Paper 1, p., 20, Paper 24, p. 18

21

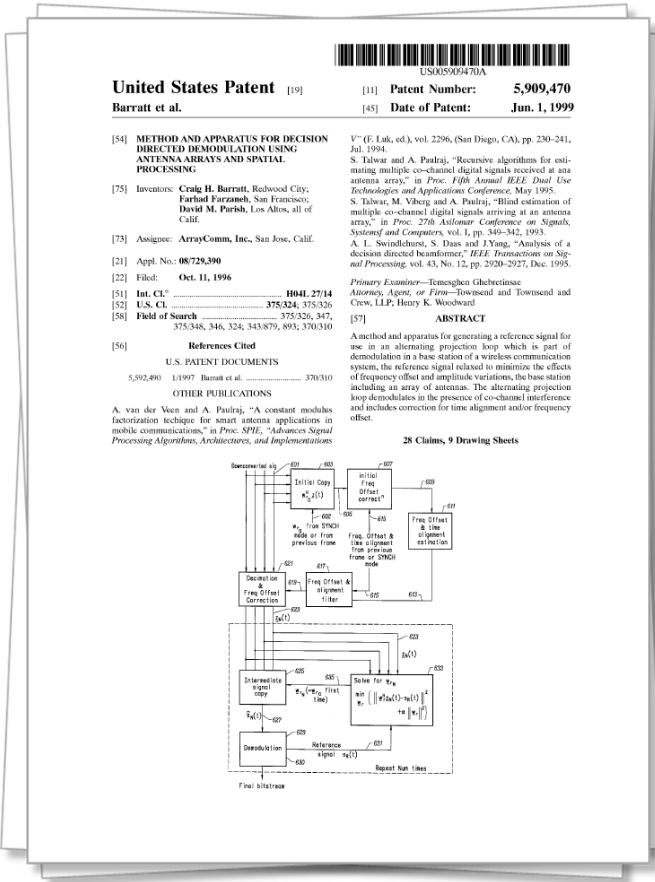
Ex.1001.00021

Ground 3 – Barratt '470

(Claims 1, 3-6, 8-10, 13, 15-17, and 19-20)

ERICSSON  **T-Mobile** **NOKIA**

Barratt '470 | U.S. Patent No. 5,909,470



United States Patent [19]

Barratt et al.

Patent Number: 5,909,470

Date of Patent: Jun. 1, 1999

[54] METHOD AND APPARATUS FOR DECISION DIRECTED DEMODULATION USING ANTENNA ARRAYS AND SPATIAL PROCESSING

[75] Inventors: Craig H. Barratt, Redwood City; Farhad Farzaneh, San Francisco; David M. Parish, Los Altos, all of Calif.

[73] Assignee: ArrayComm, Inc., San Jose, Calif.

[21] Appl. No.: 08/729,390

[22] Filed: Oct. 11, 1996

[51] Int. Cl. H04L 27/14

[52] U.S. Cl. 375/324; 375/326

[58] Field of Search 375/348, 346, 324; 343/879, 893; 370/310

[56] References Cited
U.S. PATENT DOCUMENTS
5,902,480 1/1997 Barratt et al. 370/310
OTHER PUBLICATIONS
A. van der Veen and A. Paulraj, "A constant modulus factorization technique for smart antenna applications in mobile communications," in Proc. SPIE, "Advances Signal Processing Algorithms, Architectures, and Implementations V" (F. Luk, ed.), vol. 2296, (San Diego, CA), pp. 230-241, Jul. 1994.
S. Talwar and A. Paulraj, "Recursive algorithms for estimating multiple co-channel digital signals received at an antenna array," in Proc. Fifth Annual IEEE Dual Use Technologies and Applications Conference, May 1995.
S. Talwar, M. Viberg and A. Paulraj, "Blind estimation of multiple co-channel digital signals arriving at an antenna array," in Proc. 27th Asilomar Conference on Signals, Systems and Computers, vol. I, pp. 349-342, 1993.
A. L. Swindlehurst, S. Daas and J. Yang, "Analysis of a decision directed beamformer," IEEE Transactions on Signal Processing, vol. 43, No. 12, pp. 2920-2927, Dec. 1995.

Primary Examiner—Temesghen Ghebretinsae
Attorney, Agent, or Firm—Townsend and Townsend and Crew, LLP; Henry K. Woodward

ABSTRACT
A method and apparatus for generating a reference signal for use in an alternating projection loop which is part of demodulation in a base station of a wireless communication system, the reference signal related to minimize the effects of frequency offset and amplitude variations, the base station including an array of antennas. The alternating projection loop demodulates in the presence of co-channel interference and includes correction for time alignment and/or frequency offset.

[11] Patent Number: 5,909,470

[45] Date of Patent: Jun. 1, 1999

[54] METHOD AND APPARATUS FOR DECISION DIRECTED DEMODULATION USING ANTENNA ARRAYS AND SPATIAL PROCESSING

[75] Inventors: Craig H. Barratt, Redwood City; Farhad Farzaneh, San Francisco; David M. Parish, Los Altos, all of Calif.

[73] Assignee: ArrayComm, Inc., San Jose, Calif.

[21] Appl. No.: 08/729,390

[22] Filed: Oct. 11, 1996

[51] Int. Cl. H04L 27/14

[52] U.S. Cl. 375/324; 375/326

[58] Field of Search 375/326, 347, 375/348, 346, 324; 343/879, 893; 370/310

[57] ABSTRACT

Primary Examiner—Temesghen Ghebretinsae
Attorney, Agent, or Firm—Townsend and Townsend and Crew, LLP; Henry K. Woodward

ABSTRACT

Barratt '470, cover, Paper 1, p. 2

Demonstrative Exhibit – Not Evidence

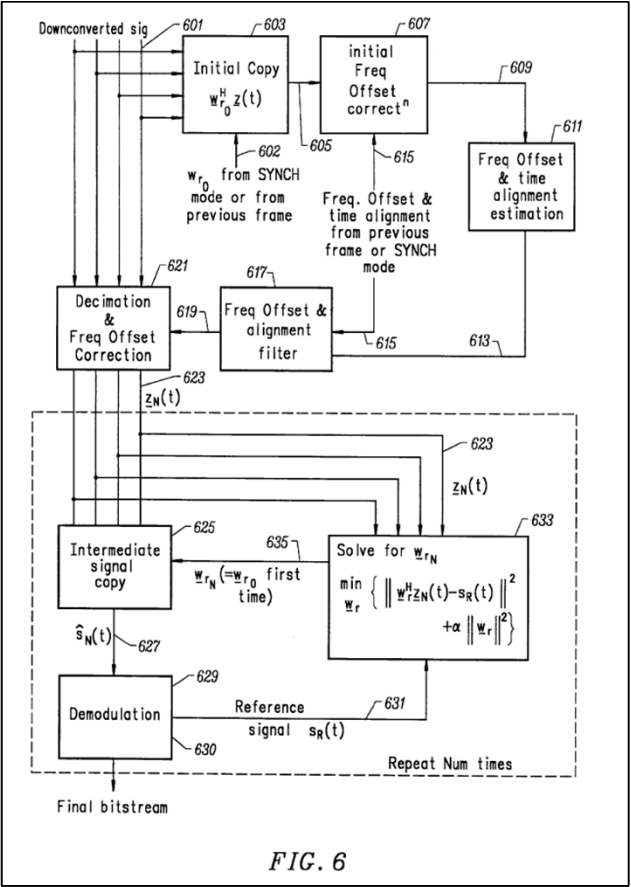
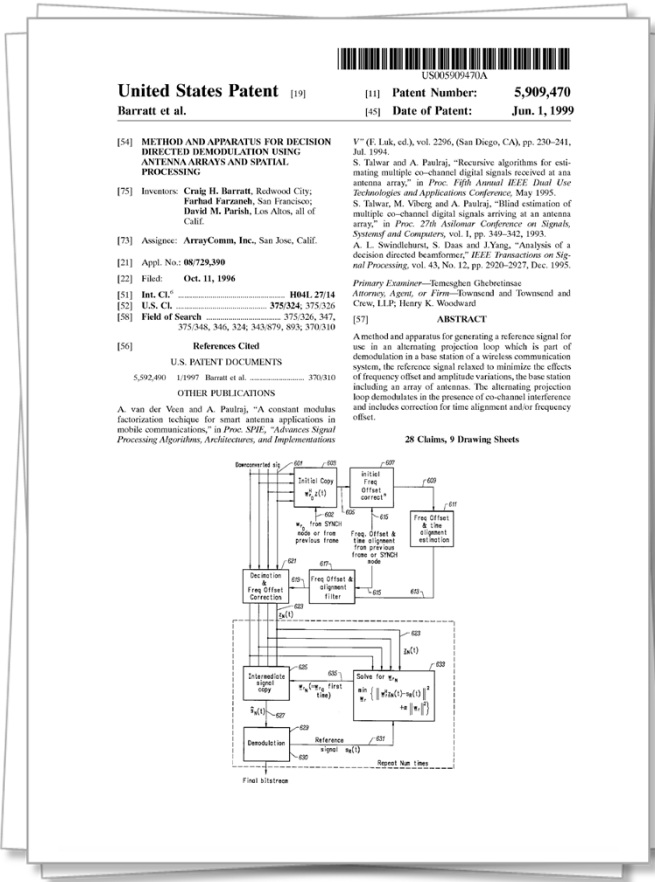
23

Ex.1001.00023

Summary of Disputes

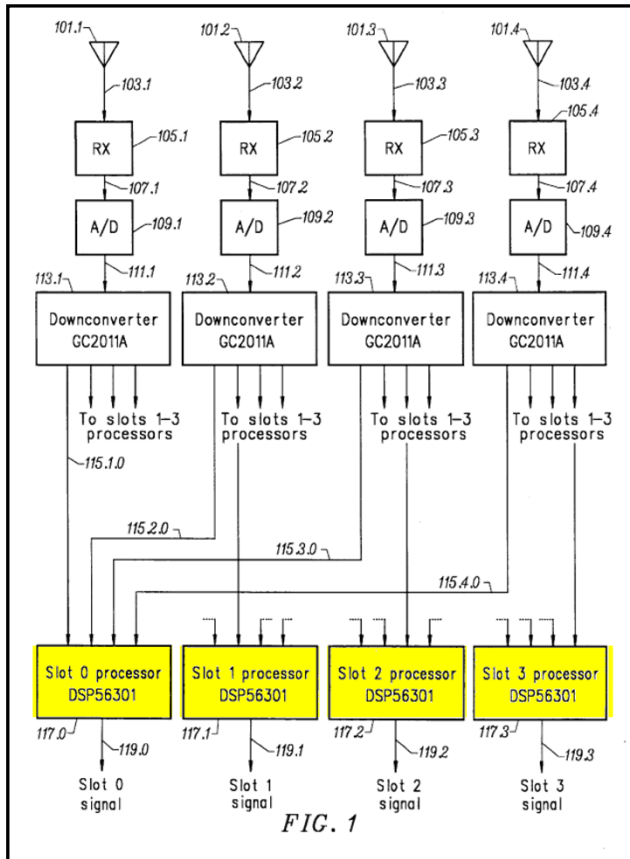
- 1 Genossar anticipates “a profile parameter storage device coupled to said profile parameter determiner” (Grounds 1 and 2)
- 2 Genossar anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 1 and 2)
- 3 Barratt '470 anticipates “a profile parameter storage device **coupled to** said profile parameter determiner” (Grounds 3, 4, and 5)
- 4 Barratt '470 anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 3, 4, and 5)
- 5 Barratt '470 discloses channel-related parameters (Grounds 3, 4, and 5)
- 6 Barratt '470 and PHS render obvious challenged claim 18 (Ground 5)
- 7 WiMAX is publicly available prior art (Ground 2)

Barratt '470 | Discloses a Profile Parameter Storage Device
Coupled to Said Profile Parameter Determiner



Barratt '470, Fig. 6

Barratt '470 | Discloses a Profile Parameter Storage Device Coupled to Said Profile Parameter Determiner



Barratt '470, Fig. 1

135. Further, Barratt '470 discloses a DSP device (i.e., “profile parameter determiner”) contained in the base station and configured to process the received down-converted burst data signals. *Id.* at 10:60-67, 24:24-48. Annotated Figure 1 (reproduced below) illustrates a base station that includes four DSP processors 117, one for each timeslot (i.e., “channel”) in a frame. *Id.* at 9:60-67; 24:24-48. Each DSP 117 maintains values associated with the signals received during that timeslot, including: an initial weight matrix, frequency offset, and time alignment parameters. *Id.* at 8:36-61; 16:17-17:7; 24:24-48. Figure 1 also shows, for example, that the Slot 0 processor 117.0 (“profile parameter determiner”) is coupled to receive an initial burst of a first burst data signal transmitted to the base station upon the “Slot 0” channel.

Ex. 1003, van der Weide declaration, ¶ 135
Paper 1, pp. 42, 47-48; Ex. 1003, Para. 135; Paper 24, pp. 15-18

Barratt '470 | Discloses a Profile Parameter Storage Device Coupled to Said Profile Parameter Determiner

United States Patent [19]
Barratt et al.

Patent Number: 5,909,470

Date of Patent: Jun. 1, 1999

54] METHOD AND APPARATUS FOR DECISION DIRECTED DEMODULATION USING ANTENNA ARRAYS AND SPATIAL PROCESSING.

75] Inventors: Craig H. Barratt, Redwood City; Farhad Farzaneh, San Francisco; David M. Parish, Los Altos, all of Calif.

73] Assignee: ArrayComm, Inc., San Jose, Calif.

21] Appl. No.: 08/729,390

22] Filed: Oct. 11, 1996

51] Int. Cl.⁷: H04L 27/14

52] U.S. Cl.: 375/324, 375/326

58] Field of Search: 375/326, 347, 375/348, 346, 324, 343/879, 803, 370/310

References Cited
U.S. PATENT DOCUMENTS
5,592,400 1/1997 Barratt et al. 370/310
OTHER PUBLICATIONS
A. van der Veen and A. Paulraj, "A constant modulus factorization technique for smart antenna applications in mobile communications," in Proc. SPIE, "Advanced Signal Processing Algorithms, Architectures, and Implementations

V" (F. Luk, ed.), vol. 2206, (San Diego, CA), pp. 230-241, Jul. 1994.

S. Talwar and A. Paulraj, "Recursive algorithms for estimating multiple co-channel digital signals received at an antenna array," in Proc. Fifth Annual IEEE Dual Use Technologies and Applications Conference, May 1995.

S. Talwar, M. Viberg and A. Paulraj, "Blind estimation of multiple co-channel digital signals arriving at an antenna array," in Proc. 27th Asilomar Conference on Signals, Systems and Computers, vol. 1, pp. 349-342, 1993.

A. L. Swindlehurst, S. Das and J. Yang, "Analysis of a decision directed beamformer," IEEE Transactions on Signal Processing, vol. 43, No. 12, pp. 2920-2927, Dec. 1995.

Primary Examiner—Temesghen Ghebretinsae
Attorney, Agent, or Firm—Townsend and Townsend and Chew, LLP; Henry K. Woodward

ABSTRACT
A method and apparatus for generating a reference signal for use in an alternating projection loop which is part of demodulation in a base station of a wireless communication system, the reference signal related to minimize the effects of frequency offset and amplitude variations, the base station including an array of antennas. The alternating projection loop demodulates in the presence of co-channel interference and includes correction for time alignment and/or frequency offset.

28 Claims, 9 Drawing Sheets

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA
Advance Information
24-Bit General Purpose Digital Signal Processor

DSP56301

The DSP56301 is the first member in the new DSP56300 Family. This family uses a high performance, single clock cycle per instruction engine providing two fold performance increase over Motorola's popular DSP56000 Family, while retaining code compatibility. Several significant architectural enhancements include a barrel shifter, 24 bit addressing, instruction cache, and DMA functionality.

The DSP56301 offers 66 MIPS using an internal 66 MHz clock and will soon be available at 80 MIPS using an internal 80 MHz clock at 3.0 - 3.6 volts. The DSP56300 Family offers a new level of performance in MIPS, rich instruction set, and low power dissipation enabling a new generation of products in wireless, telecommunications, and multimedia.

Figure 1 DSP56301 Block Diagram

© MOTOROLA, INC., 1993

IPR2023-01416
Petitioner's Ex. 1042
Ex. 1042.00056

Ex. 1042 p. 56, Motorola DSP56301 datasheet

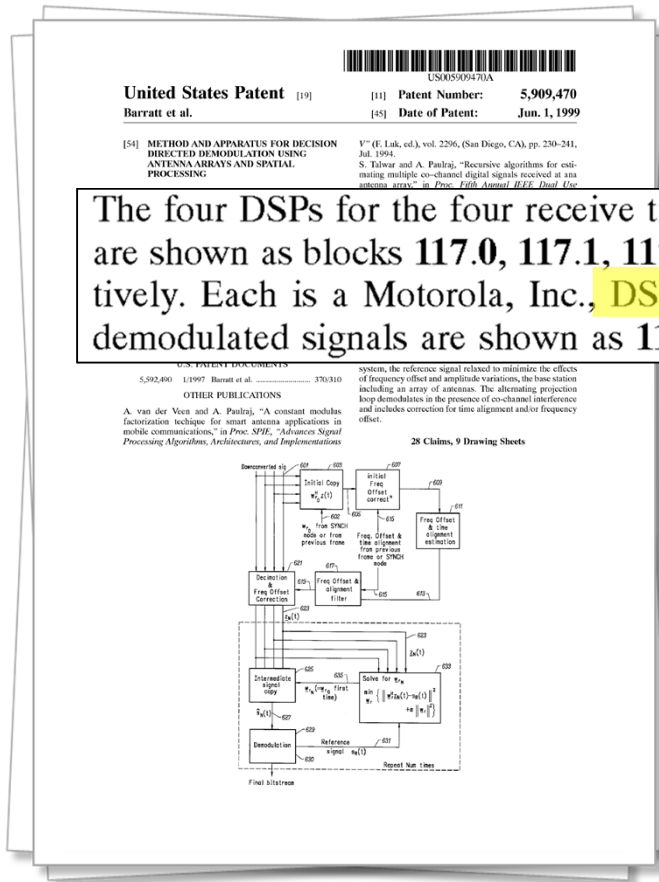
Demonstrative Exhibit – Not Evidence

Paper 1, pp. 42, 47-48; Paper 24, pp. 15-18

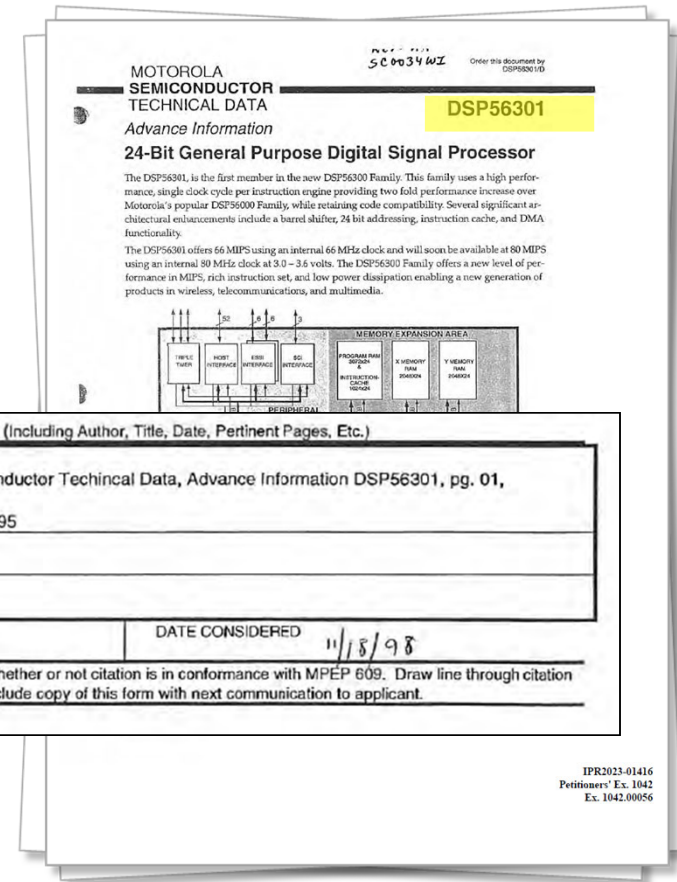
27

Ex.1001.00027

Barratt '470 | Discloses a Profile Parameter Storage Device Coupled to Said Profile Parameter Determiner



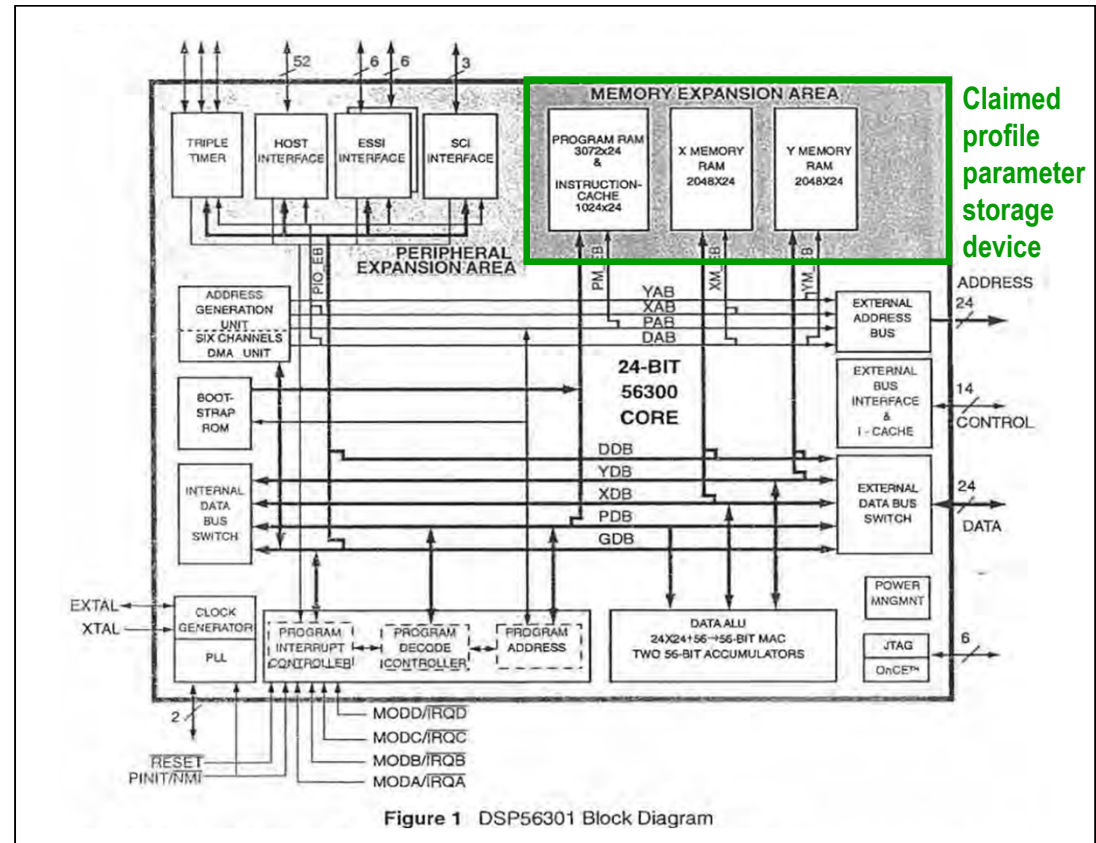
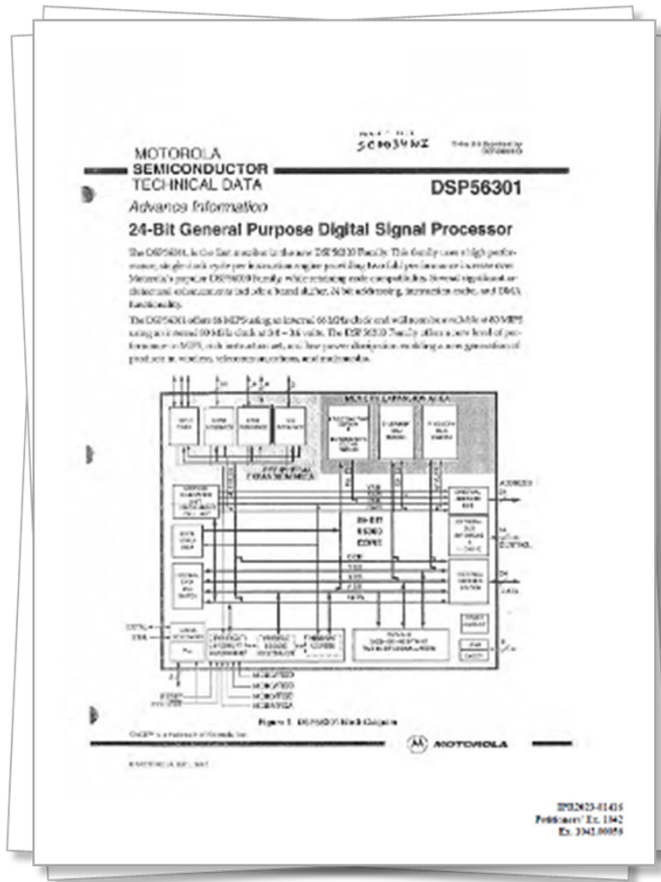
Barratt '470, cover



Ex. 1042 p. 55, USPTO
record of 11/18/1998

Ex. 1042 p. 56, Motorola DSP56301 datasheet

Barratt '470 | Discloses a Profile Parameter Storage Device Coupled to Said Profile Parameter Determiner

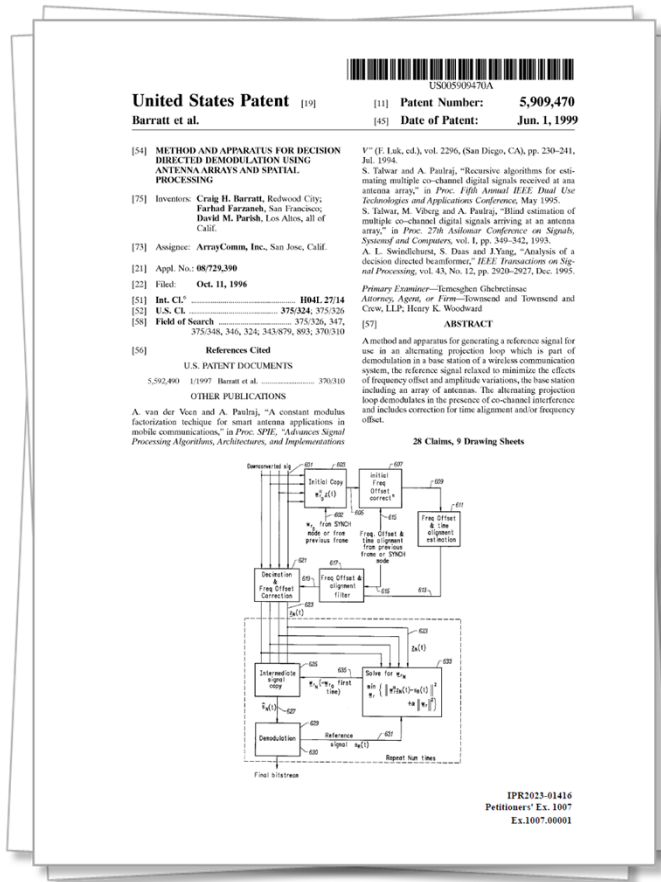


Ex. 1042 p. 56, Motorola DSP56301 datasheet
Paper 1, pp. 42, 47-48; Ex. 1003, Para. 135; Paper 24, pp. 15-18

Summary of Disputes

- 1 Genossar anticipates “a profile parameter storage device coupled to said profile parameter determiner” (Grounds 1 and 2)
- 2 Genossar anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 1 and 2)
- 3 Barratt '470 anticipates “a profile parameter storage device coupled to said profile parameter determiner” (Grounds 3, 4, and 5)
- 4 Barratt '470 anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 3, 4, and 5)**
- 5 Barratt '470 discloses channel-related parameters (Grounds 3, 4, and 5)
- 6 Barratt '470 and PHS render obvious challenged claim 18 (Ground 5)
- 7 WiMAX is publicly available prior art (Ground 2)

Barratt '470 | Discloses a Profile Parameter Storage Device For Storing Values Representative of the At Least One Signal-Related Parameter and the At Least One Channel-Related Parameter



Barratt '470 parameter	'477 parameter type	Barratt '470 profile parameter storage device disclosure
frequency offset	signal-related parameter	Both are used in a “recursive loop....with starting estimate of w_r and of the alignment and frequency offset obtained from the processing of the same signal on the previous frame.” 16:32-17:7 Both are stored in the Motorola DSP56301 memory components.
antenna weights	channel-related parameter	

Paper 1, pp. 20, 44-48; Paper 24, p. 19

Summary of Disputes

- 1 Genossar anticipates “a profile parameter storage device coupled to said profile parameter determiner” (Grounds 1 and 2)
- 2 Genossar anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 1 and 2)
- 3 Barratt '470 anticipates “a profile parameter storage device coupled to said profile parameter determiner” (Grounds 3, 4, and 5)
- 4 Barratt '470 anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 3, 4, and 5)
- 5 Barratt '470 discloses channel-related parameters (Grounds 3, 4, and 5)**
- 6 Barratt '470 and PHS render obvious challenged claim 18 (Ground 5)
- 7 WiMAX is publicly available prior art (Ground 2)

'477 Patent | Channel-Related Parameter

1.pre	Profile-creating apparatus for creating at least a first profile associated with transmission upon at least a first channel of at least a first burst-data signal transmitted in bursts to a receiving station, said profile-creating apparatus comprising:
1.A	a profile parameter determiner coupled to receive an indication of an initial burst of the first burst data signal transmitted upon the first channel to the receiving station,
1.B	said profile parameter determiner for determining a value of at least one signal-related parameter and at least one channel-related parameter, wherein the signal-related and channel-related parameters are collectively representative of communication of the first burst data signal over the first channel to the receiving station; and
1.C	a profile parameter storage device coupled to said profile parameter determiner, said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter determined by said profile parameter determiner,
1.D	the values stored at said profile parameter storage device to be used to facilitate receive operations performed at the receiving station on subsequent bursts of the first burst data signal.

Petitioner's Position



Plain and ordinary meaning

Paper 1, p. 6, Paper 24, pp. 12-13

Patent Owner's Position



If antenna related, only antenna combining parameters when antenna diversity and/or beamforming is utilized

Paper 21, p. 47-48

Barratt '470 | Discloses Channel-Related Parameters

United States Patent [19]
Barratt et al.

[11] Patent Number: **5,909,470**
[45] Date of Patent: **Jun. 1, 1999**

[54] **METHOD AND APPARATUS FOR DECISION DIRECTED DEMODULATION USING ANTENNA ARRAYS AND SPATIAL PROCESSING**

[75] Inventors: Craig H. Barratt, Redwood City; Farhad Farzaneh, San Francisco; David M. Parish, Los Altos, all of Calif.

[73] Assignee: ArrayComm, Inc., San Jose, Calif.

[21] Appl. No.: 08/729,390

[22] Filed: Oct. 11, 1996

[51] Int. Cl.⁷: H04L 27/14

[52] U.S. Cl.: 375/324; 375/326

[58] Field of Search: 375/326, 347, 375/348, 346, 324, 343/879, 893, 370/310

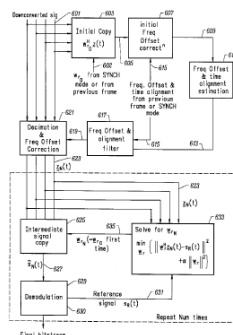
[56] **References Cited**
U.S. PATENT DOCUMENTS
5,902,480 1/1997 Barratt et al. 370/310

OTHER PUBLICATIONS
A. van der Veen and A. Paulraj, "A constant modulus factorization technique for smart antenna applications in mobile communications," in *Proc. SPIE, "Advances Signal Processing Algorithms, Architectures, and Implementations"*

V" (F. Lali, ed.), vol. 2296, (San Diego, CA), pp. 230-241, Jul. 1994.
S. Talwar and A. Paulraj, "Recursive algorithms for estimating multiple co-channel digital signals received at an antenna array," in *Proc. Fifth Annual IEEE Dual Use Technologies and Applications Conference*, May 1995.
S. Talwar, M. Viberg, and A. Paulraj, "Blind estimation of multiple co-channel digital signals arriving at an antenna array," in *Proc. 27th Asilomar Conference on Signals, Systems and Computers*, vol. 1, pp. 349-342, 1993.
A. L. Swindlehurst, S. Das and J. Yang, "Analysis of a decision directed beamformer," *IEEE Transactions on Signal Processing*, vol. 43, No. 12, pp. 2920-2927, Dec. 1995.

ABSTRACT
A method and apparatus for generating a reference signal for use in an alternating projection loop which is part of demodulation in a base station of a wireless communication system, the reference signal related to minimize the effects of frequency offset and amplitude variations, the base station including an array of antennas. The alternating projection loop demodulates in the presence of co-channel interference and includes correction for time alignment and/or frequency offset.

28 Claims, 9 Drawing Sheets



Applications"). The general idea is to increase the quality of communication by using an antenna array rather than a single antenna, together with processing of the signals received at the antennas. The antenna array also can be used to increase spectrum efficiency by adding spatial multiplexing to conventional channels so that several users can communicate simultaneously on the same conventional channel. We call this SDMA for spatial division multiple access. Thus, taking frequency division multiplexing

Barratt '470, 1:63-2:4

Spatial processing of the (complex valued) m signals at the m antennas comprises for each signal of interest determining a weighted sum of the antenna signals. The complex valued weights can be represented by a vector called herein a weight vector. The more general situation is that the

Barratt '470, 2:47-51

Ground 4 – Barratt '470 in View of Barratt '490 (Claims 7, 11, 12)

ERICSSON  T-Mobile NOKIA

Ground 4 Non-Disputed Issues

Additional Limitations of Claims 7, 11, and 12 are disclosed by Barratt '490

C. Grounds 3-5—All Claims: The Petition Fails to Allege that Barratt '470 Discloses a “Profile Parameter Storage Device Coupled to Said Profile Parameter Determiner” as Recited in Claim [1.C].....	27
D. The Board Should Deny Institution Under <i>Fintiv</i> , 35 U.S.C. § 314(d)	34
VIII. CONCLUSION	36

Paper 8, Table of Contents

C. Grounds 3-5—All Claims: The Petition Fails to Allege that Barratt '470 Discloses a “Profile Parameter Storage Device Coupled to Said Profile Parameter Determiner” as Recited in Claim [1.C].....	38
D. Grounds 3-5—All Claims: Petitioner’s Expert Did Not Consider Whether Barratt '470’s Antenna Weights are Channel-Related Parameters as Defined by the '477 Patent.....	47
E. Ground 5—Claim 18: The Petition Fails to Explain How it Consistently Maps the Same Parameters in Claims 16 and 18 Over Barratt '470 and PHS.....	48
VII. CONCLUSION	49

Paper 21, Table of Contents

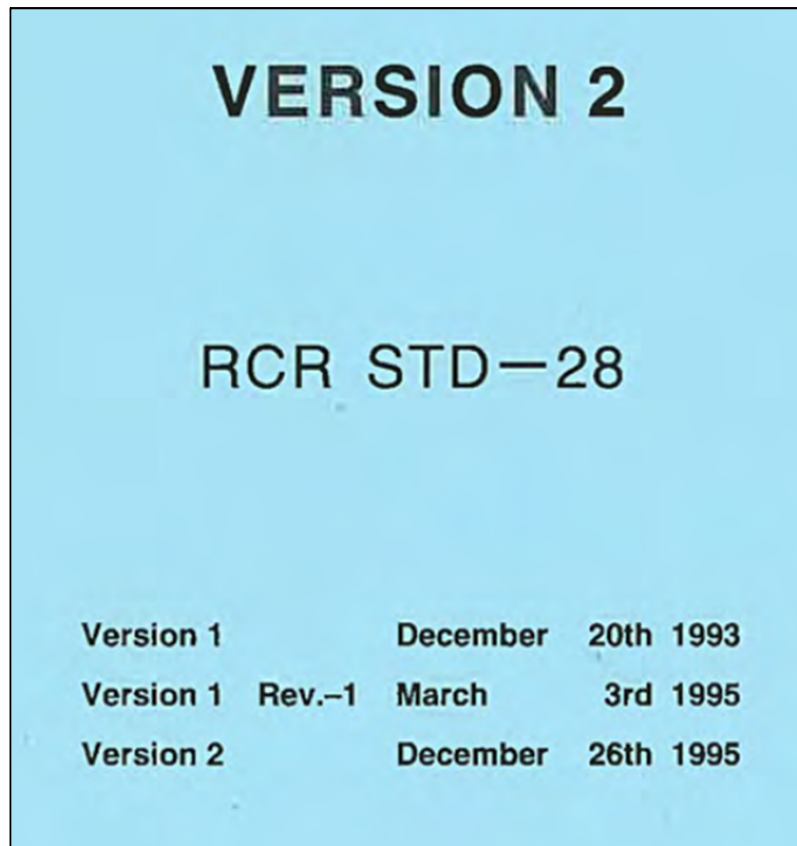
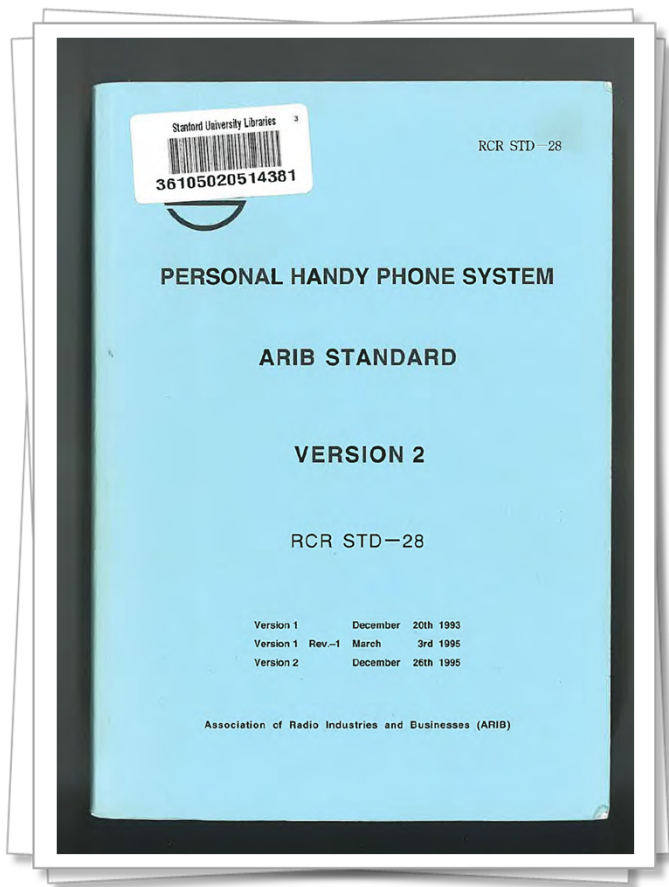
Ground 5 – Barratt '470 in View of PHS (Claims 2, 14, and 18)

ERICSSON  T-Mobile NOKIA

Summary of Disputes

- 1 Genossar anticipates “a profile parameter storage device coupled to said profile parameter determiner” (Grounds 1 and 2)
- 2 Genossar anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 1 and 2)
- 3 Barratt '470 anticipates “a profile parameter storage device coupled to said profile parameter determiner” (Grounds 3, 4, and 5)
- 4 Barratt '470 anticipates “said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter” (Grounds 3, 4, and 5)
- 5 Barratt '470 discloses channel-related parameters (Grounds 3, 4, and 5)
- 6 Barratt '470 and PHS render obvious challenged claim 18 (Ground 5)**
- 7 WiMAX is publicly available prior art (Ground 2)

PHS | Personal Handy Phone System ARIB Standard Version 2 RCR STD – 28



PHS, cover; Paper 1, p. 2

'477 Patent | Claims 16 and 18



(12) **United States Patent**
Struhaker et al. (10) Patent No.: **US 6,947,477 B2**
(45) Date of Patent: **Sep. 20, 2005**

(54) **APPARATUS AND METHOD FOR CREATING SIGNAL AND PROFILES AT A RECEIVING STATION**
(52) U.S. CL. 375/222, 375/224
(56) Field of Search 375/222, 370/314, 370/321, 347

(75) Inventors: **Paul F. Struhaker**, Plano, TX (US);
Russell C. McKown, Richardson, TX (US)
(56) **References Cited**

(73) Assignee: **Rare Technologies, Inc.**, Plano, TX (US)
U.S. PATENT DOCUMENTS

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 801 days.
5,703,753 A * 8/1998 Huskey et al. 455/15
5,832,365 A * 11/1998 Chen et al. 455/15
5,978,650 A * 11/1999 Fischer et al. 455/15
6,227,858 B1 * 4/2001 Constantine 370/474
6,230,326 B1 * 5/2001 Unger et al. 725/111
6,320,903 B1 * 11/2001 Jackson et al. 375/222
6,340,071 B1 * 2/2002 Hande 375/222
6,590,872 B1 * 7/2003 Shine et al. 370/314
6,636,480 B1 * 10/2003 Johnson 370/328
6,654,344 B1 * 11/2003 Reza et al. 370/469
2003/0034495 A1 * 1/2003 Shahar et al. 370/389

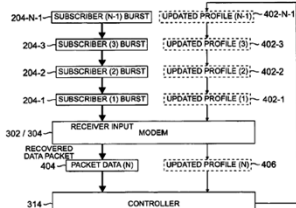
(21) Appl. No.: **09/839,719**
(22) Filed: **Apr. 20, 2001**
FOREIGN PATENT DOCUMENTS

(65) **Prior Publication Data**
US 2002/0097685 A1 Jul. 25, 2002
EP 0 800 285 A2 10/1997
WO 96/34851 10/1996
WO 99/31837 6/1999
* cited by examiner

Related U.S. Application Data
Provisional application No. 60/262,527, filed on Jan. 19, 2001, provisional application No. 60/262,712, filed on Jan. 19, 2001, provisional application No. 60/262,825, filed on Jan. 19, 2001, provisional application No. 60/262,698, filed on Jan. 19, 2001, provisional application No. 60/262,826, filed on Jan. 19, 2001, provisional application No. 60/262,951, filed on Jan. 19, 2001, provisional application No. 60/262,824, filed on Jan. 19, 2001, provisional application No. 60/263,107, filed on Jan. 19, 2001, provisional application No. 60/263,107, filed on Jan. 19, 2001, provisional application No. 60/273,579, filed on Mar. 5, 2001, provisional application No. 60/262,955, filed on Jan. 19, 2001, provisional application No. 60/262,756, filed on Jan. 19, 2001, provisional application No. 60/273,699, filed on Mar. 5, 2001, provisional application No. 60/273,757, filed on Mar. 5, 2001, provisional application No. 60/270,378, filed on Feb. 21, 2001, provisional application No. 60/270,380, filed on Feb. 21, 2001, and provisional application No. 60/270,450, filed on Feb. 21, 2001.

(51) Int. Cl. **H04B 1/38; H04L 5/16**
20 Claims, 5 Drawing Sheets

ABSTRACT
Apparatus, and an associated method, for creating a profile associated with burst data signals communicated to a base station of a fixed wireless access communication system. The profile is created to facilitate receive operations performed upon subsequent bursts of the burst data signal. The profile is stored at a storage device and retrieved when subsequent bursts of the burst data signal are received at the base station.



16.pre

A method for creating at least a first profile associated with transmission upon at least a first channel of at least a first burst data signal in bursts to a receiving station, said method comprising:

16.A

responsive to reception at the receiving station of an initial burst of the first burst data signal transmitted upon the first channel, determining a value of at least **one signal-related parameter** and at least **one channel-related parameter**, wherein the **signal-related** and **channel-related parameters** are collectively representative of communication of the first burst data signal over the first channel to the receiving station;

16.B

storing values representative of the at least **one signal-related parameter** and the at least **one channel-related parameter** determined during said operation of determining; and

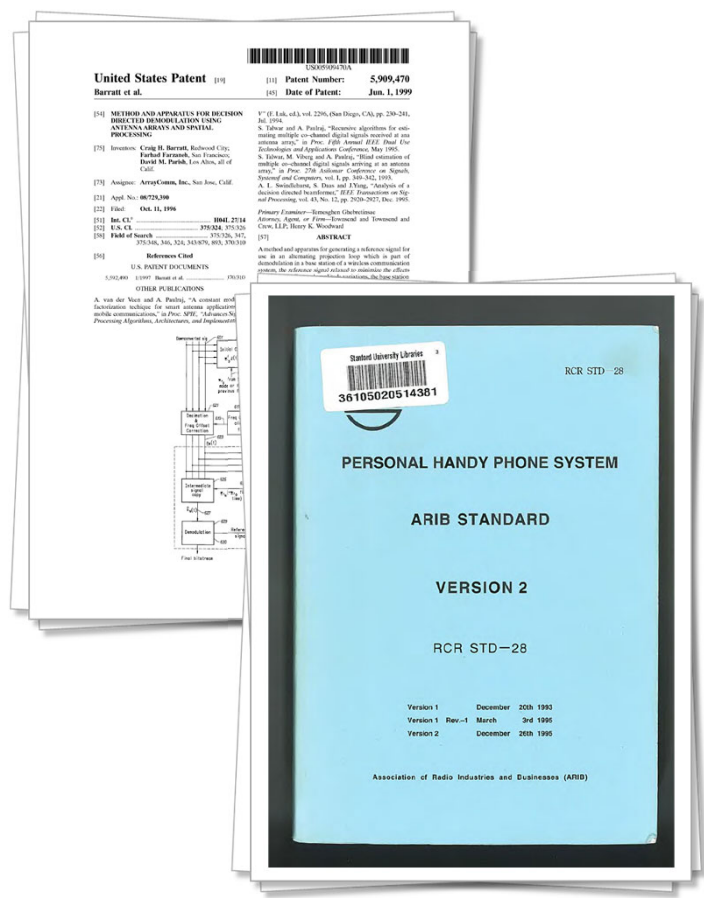
16.C

using the values stored during said operation of storing to facilitate receive operations performed at the receiving station upon at least one subsequent burst of the first burst data signal.

18

The method of claim 16 wherein the receiving station is operable in a communication system in which communication protocols include a contention period and wherein the initial burst of the first burst data signal responsive to which the at least **one signal-related parameter** and the at least **one channel-related parameter** are determined is transmitted to the receiving station during the contention period.

Barratt '470 and PHS | Claim 18 Is Obvious



'477 Parameter Type	Barratt '470 and / or PHS parameter, Claim 16	Barratt '470 and / or PHS parameter, Claim 1	Barratt '470 and / or PHS parameter, Claim 18 (via Claim 2)
signal-related parameter	Frequency offset. Barratt '470 4:56-5:6; 8:36-61, 16:17-17:7 Paper 1, pp. 58, 44	Frequency offset. Barratt '470 4:56-5:6; 8:36-61, 16:17-17:7 Paper 1, p. 44	Frequency. Barratt '470 8:36-47 Paper 1, pp. 67-68 Paper 24, pp. 21-22
signal-related parameter	Time alignment. Barratt '470 8:48-61, 11:39-41, 16:17-17:7 Paper 1, pp. 58, 44-45	Time alignment. Barratt '470 8:48-61, 11:39-41, 16:17-17:7 Paper 1, pp. 44-45	
channel-related parameter	Antenna weights. Barratt '470 1:35-2:14; 2:47-51 Paper 1, pp. 58, 45-46	Antenna weights. Barratt '470 1:35-2:14; 2:47-51 Paper 1, pp. 45-46	Timeslot. Barratt '470 8:36-47 Further, would be obvious to one of skill in the art that additional signal-related and channel-related parameters could be exchanged. Paper 1, pp. 67-68 Paper 24, pp. 21-22

Ground 2 – Genossar in View of WiMAX (Claims 2, 10-12, 14, and 18)

ERICSSON  T-Mobile NOKIA

Ground 2 Non-Disputed Issues

Additional Limitations of Claims 2, 10-12, 14, and 18 are disclosed by WiMAX

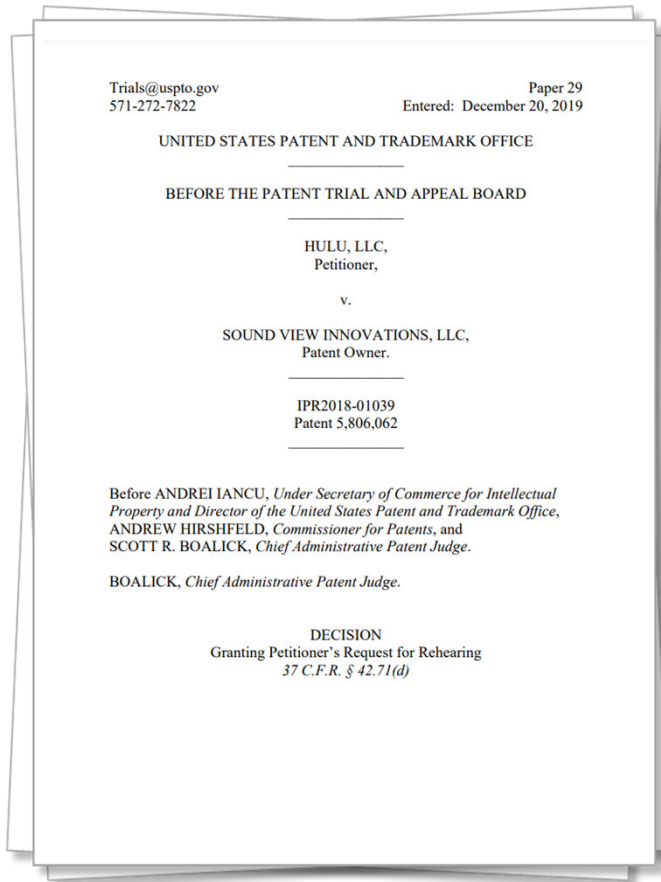
B. Ground 2—All Claims: WiMAX is Not Prior Art.....	21
1. The Copyright Stamp on the WiMAX Potential Draft Standard Does Not Demonstrate Public Accessibility.....	21
2. Petitioners Have Failed to Show that a Potential Draft IEEE Standard Document Would Have Been Publicly Accessible Prior to the Critical Date of the '477 Patent	24
C. Grounds 3-5—All Claims: The Petition Fails to Allege that Barratt '470 Discloses a “Profile Parameter Storage Device Coupled to Said Profile Parameter Determiner” as Recited in Claim [1.C].....	27

Paper 8, Table of Contents

B. Ground 2—All Claims: WiMAX is Not Prior Art.....	31
1. The August/September 2000 Stamp on the WiMAX Potential Draft Standard Does Not Demonstrate Public Accessibility.	31
2. Petitioners Have Failed to Show that a Potential Draft IEEE Standard Document Would Have Been Publicly Accessible Prior to the Critical Date of the '477 Patent	34
C. Grounds 3-5—All Claims: The Petition Fails to Allege that Barratt '470 Discloses a “Profile Parameter Storage Device Coupled to Said Profile Parameter Determiner” as Recited in Claim [1.C].....	38

Paper 21, Table of Contents

WiMAX | Petitioners' Evidence Is Timely

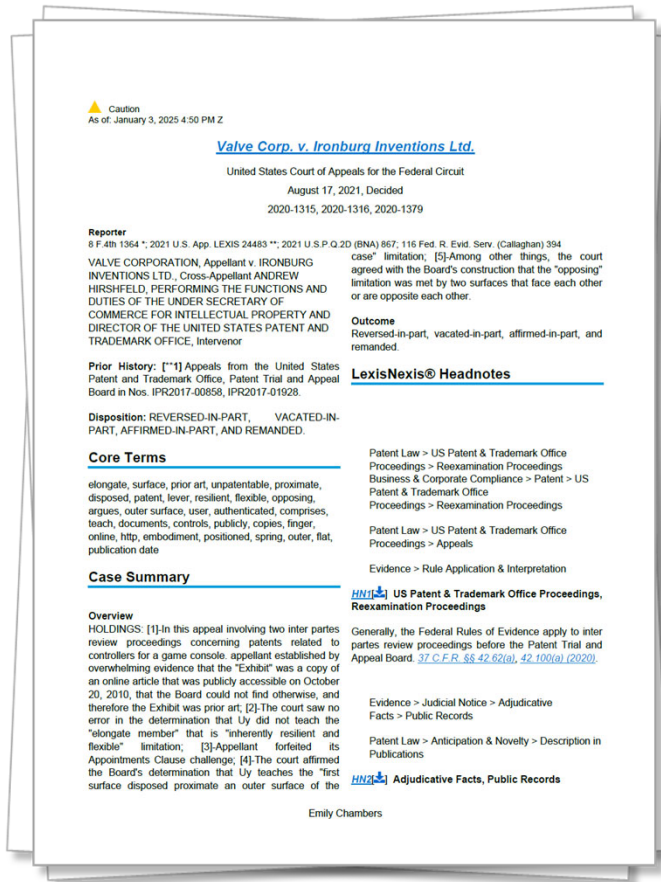


IPR2018-01039
Patent 5,806,062

For example, if the patent owner challenges a reference's status as a printed publication, a petitioner may submit a supporting declaration with its reply to further support its argument that a reference qualifies as a printed publication. *See* 37 C.F.R. §§ 42.2 (affidavit), 42.23. Or, if a patent owner does not challenge the reference's status as a printed publication, the petitioner may move to submit the declaration through the supplemental information process. 37 C.F.R. § 42.123; *see, e.g., Nikon Corp. v. ASML Netherlands B.V.*, IPR2018-00688, Paper 16 at 5–6 (PTAB Oct. 29, 2018) (granting motion to submit librarian declaration as supplemental information); *Ericsson Inc. v. Intellectual Ventures I LLC*, IPR2014-01149, Paper 19 at 6–7 (PTAB March 30, 2015) (granting motion to submit supplemental information as to librarian declarations attesting to the public accessibility of documents on which trial was instituted); *see also Telefonaktiebolaget LM Ericsson v. TCL Corp.*, 941 F.3d 1341, 1345–46 (Fed. Cir. 2019) (concluding that the Board did not abuse its discretion in admitting librarian declaration as supplemental information).

Hulu, LLC v. Sound View Innovations, LLC, IPR2018-01039,
Paper 29 at 14-16 (PTAB Dec. 20, 2019) (precedential)

WiMAX | Petitioners' Evidence Is Timely

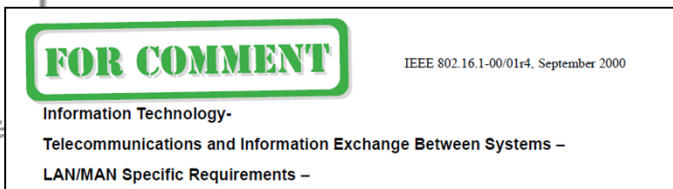
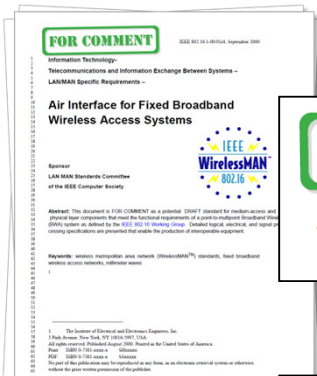


⁶ Ironburg argues that these documents were untimely submitted on reply, inadmissible hearsay, and not relevant. [HN1](#) [↑] Generally, the Federal Rules of Evidence apply to IPR proceedings before the Board. [37 C.F.R. §§ 42.62\(a\), 42.100\(a\) \(2020\)](#).

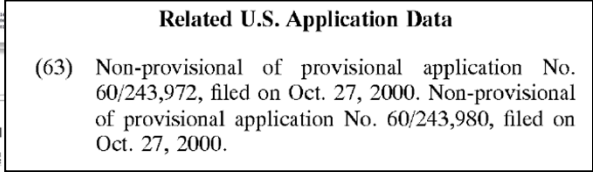
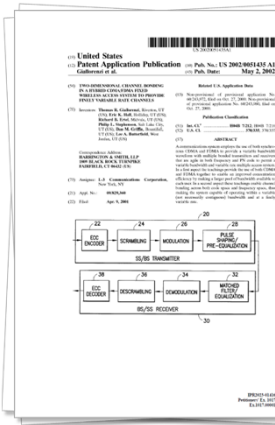
Ironburg's contentions are without merit. Valve's submission of these documents was not untimely. [HN2](#) [↑] A petitioner may provide evidence of public accessibility of a reference after the petition stage if the patent owner raises a challenge to public accessibility. See [VidStream LLC v. Twitter, Inc., 981 F.3d 1060, 1064-65 \(Fed. Cir. 2020\)](#). With respect to hearsay, the documents are excluded by the hearsay rule or fall within an exception. See [Fed. R. Evid. 803\(8\)](#) (public records); [Fed. R. Evid. 801\(d\)\(2\)](#) (opposing party's statement); [Kaempe v. Myers, 367 F.3d 958, 965, 361 U.S. App. D.C. 335 \(D.C. Cir. 2004\)](#) (documents recorded by the Patent and Trademark office "are public records subject to judicial notice"). They are also clearly relevant.

Valve Corp. v. Ironburg Inventions Ltd., 8 F.4th 1364, 1370 n. 6 (Fed. Cir. 2021)

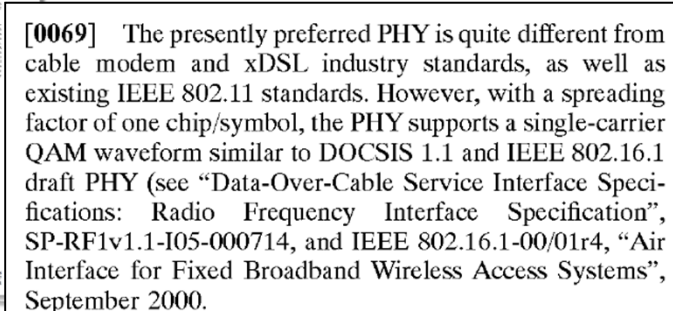
WiMAX | Evidence of Public Availability



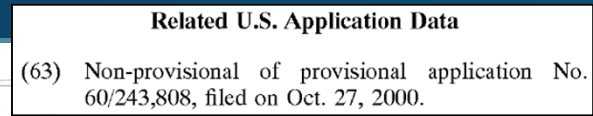
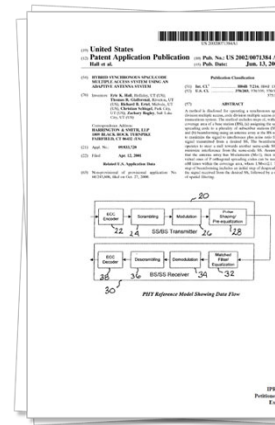
WiMAX, cover; Paper 24, pp. 22-23



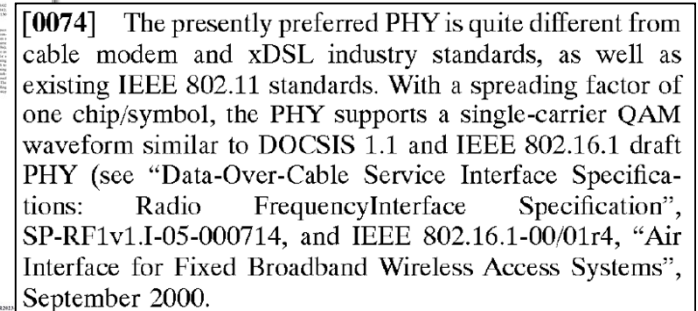
Giallorenzi, cover; Paper 24, p. 23



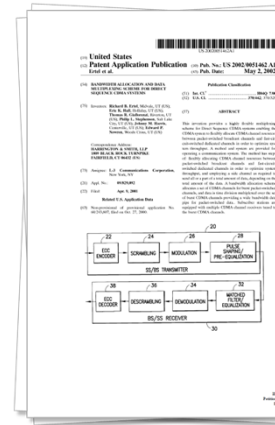
Giallorenzi, Para. 69



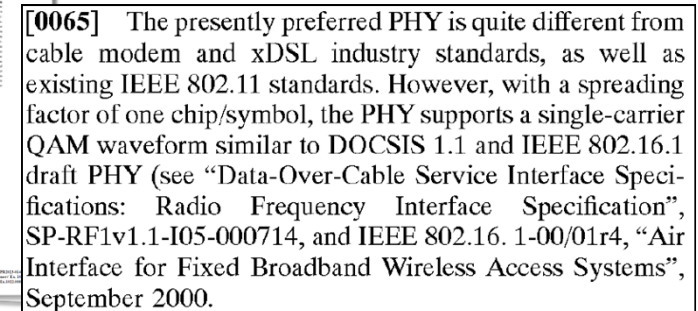
Hall, cover; Paper 24, p. 23



Hall, Para. 74

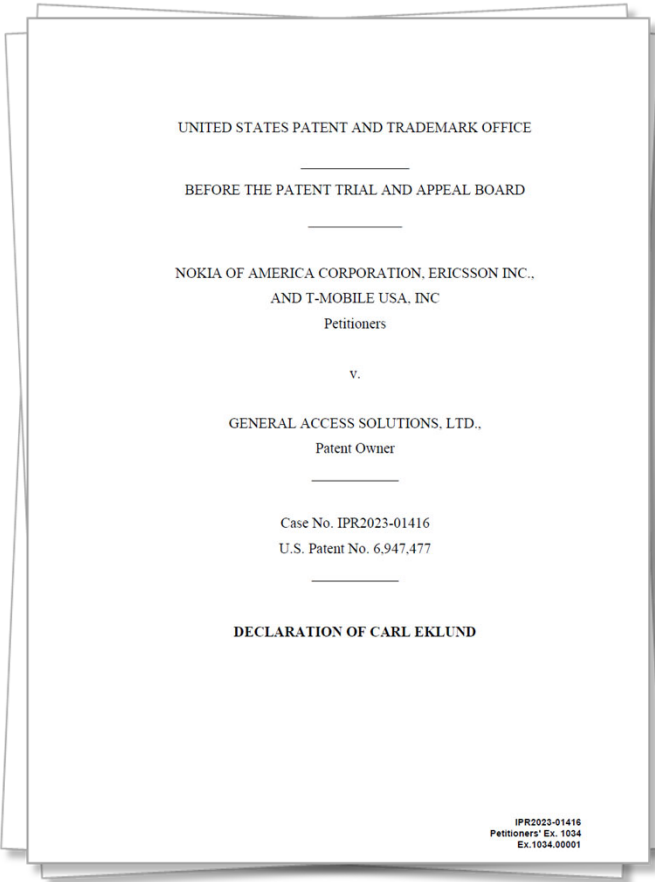


Ertel, cover; Paper 24, p. 23



Ertel, Para. 65

WiMAX | Evidence of Public Availability



29. I recall that, following the completion of Session #9, Ex. 1006 was drafted and made accessible to the public. This is confirmed by the Session #9 Document List (Ex. 1026). Below is an annotated excerpt of the Session #9 Document List (Ex. 1026) that labels the hyperlinks to other exhibits discussed in this Declaration. First, the hyperlink 802.16.1-00/01r4 is a link to Ex. 1006. Ex. 1026 indicates that Ex. 1006 was accessible on September 29, 2000. Second, the hyperlink 802.16.1-00/05r1 leads to Ex. 1031, which was also accessible on September 29, 2000.

802.16 Session #9 Document List

This list was updated on 27 September 2000. It includes all Session #9 documents except liaison letters and the updated 802.16.2 working document.

- Session #9 Attendance list
- 802.16.1pp-00/45
- Measurements and Models of a Power Amplifier Suitable for 802.16.1 (Donald DeGroot)
- 802.16.1-00/01r4
- Air Interface for Fixed Broadband Wireless Access Systems (TG1, 00/09/29) Ex. 1006
- 802.16.1-00/04
- Comparison between TG3 Functional Requirements Document and TG1 proposed MAC (TG1 and TG3, 00/09/14)
- 802.16.1-00/05r1
- Working Group Review: Call for Comments on IEEE 802.16.1-00/01r4 (TG1, 00/09/29) Ex. 1031

Ex. 1026.000001 (annotated).

Eklund Dec. Ex. 1034, p. 8

37. As mentioned above, Ex. 1029 (<https://www.ieee802.org/16/meetings/mtg10/report.html>) is the report on Session #10. Ex. 1029 states that, at the Session #10 meeting, “TG1 resolved the 584 comments received in response to the Working Group Review of the working version of the 10-66 GHz IEEE 802.16.1 air interface, which has been downloaded over 20,000 times.” *Id.* Below is an annotated excerpt of Ex. 1029 to explain the hyperlinks. The “working version” of the 10-66 GHz IEEE 802.16.1 air interface is a hyperlink to Ex. 1006. The “resolved the 584 comments” is a hyperlink to Ex. 1030. Thus, this confirms that by November 2000, Ex. 1006 had been commented on 584 times and downloaded 20,000 times. This also confirms that one of the focuses of Session #10 was to discuss Ex. 1006.

Ex. 1030

Ex. 1006

Task Group 1 (TG1): Air Interface for 10-66 GHz

TG1 resolved the 584 comments received in response to the Working Group Review of the working version of the 10-66 GHz IEEE 802.16.1 air interface, which has been downloaded over 20,000 times. A decision to forward the document to Working Group Letter Ballot was postponed until Session #11 pending an editorial restructuring which will accommodate the request of the Task Group 3 MAC Committee. An interim Task Group 1 meeting was scheduled for 12-14 December 2000 in San Diego, California, USA to address this editorial work.

Ex. 1029.000001 (annotated).

Eklund Dec. Ex. 1034, p. 12

Overview of the '477 Patent

ERICSSON  T-Mobile NOKIA

US0006947477B2

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

(10) Patent No.: **US 6,947,477 B2**
(45) Date of Patent: **Sep. 20, 2005**

(54) **APPARATUS AND METHOD FOR CREATING SIGNAL AND PROFILES AT A RECEIVING STATION**

(75) Inventors: **Paul F. Srulsaker, Plano, TX (US); Russell C. McKown, Richardson, TX (US)**

(73) Assignee: **Raze Technologies, Inc., Plano, TX (US)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 601 days.

(21) Appl. No.: **09/839,719**

(22) Filed: **Apr. 20, 2001**

(65) **Prior Publication Data**
US 2002/0097985 A1 Jul. 25, 2002

Related U.S. Application Data

(60) Provisional application No. 60/263,827, filed on Jan. 19, 2001; provisional application No. 60/261,712, filed on Jan. 19, 2001; provisional application No. 60/262,688, filed on Jan. 19, 2001; provisional application No. 60/262,628, filed on Jan. 19, 2001; provisional application No. 60/262,951, filed on Jan. 19, 2001; provisional application No. 60/262,824, filed on Jan. 19, 2001; provisional application No. 60/263,011, filed on Jan. 19, 2001; provisional application No. 60/265,077, filed on Jan. 19, 2001; provisional application No. 60/273,759, filed on Mar. 5, 2001; provisional application No. 60/262,955, filed on Jan. 19, 2001; provisional application No. 60/262,788, filed on Jan. 19, 2001; provisional application No. 60/273,606, filed on Mar. 5, 2001; provisional application No. 60/273,757, filed on Mar. 5, 2001; provisional application No. 60/270,385, filed on Feb. 21, 2001; provisional application No. 60/270,430, filed on Feb. 21, 2001.

(51) Int. Cl.⁷ **H04B 1/38; H04L 5/16**

(52) **U.S. CL.** **375/222; 375/224**
(58) **Field of Search** **375/222; 370/314; 370/321; 347**

(56) **References Cited**
FOREIGN PATENT DOCUMENTS

5,793,753 A	8/1998	Henshek et al.	455/15
5,832,365 A	11/1998	Chen et al.	455/15
5,978,650 A	11/1999	Fischer et al.	455/31
6,222,658 B1	4/2000	Unger et al.	370/474
6,240,326 B1	5/2001	Johnson et al.	725/111
6,320,001 B1	11/2001	Johnson et al.	375/232
6,345,071 B1	2/2002	Hanisch et al.	375/222
6,590,872 B1	7/2003	Shah et al.	370/314
6,636,400 B1	10/2003	Johnson et al.	370/328
6,654,384 B1	11/2003	Reza et al.	370/409
2003/0032095 A1	1/2003	Shah et al.	370/389

FOREIGN PATENT DOCUMENTS

EP	8 800 285 A2	10/1997
WO	WO 96/34841	10/1996
WO	WO 96/39387	6/1999

* cited by examiner

Primary Examiner—Stephen Chin
Assistant Examiner—Harry Vartanian

(57) **ABSTRACT**

Apparatus, and an associated method, for creating a profile associated with burst data signals communicated to a base station of a fixed wireless access communication system. The profile is created to facilitate receiver operation performed upon subsequent bursts of the burst data signal. The profile is stored at a storage device and retrieved when subsequent bursts of the burst data signal are received at the base station.

29 Claims, 5 Drawing Sheets


```

graph TD
    B1[204-N-1 - SUBSCRIBER (N-1) BURST] --> B3[204-3 - SUBSCRIBER (3) BURST]
    P1[UPDATED PROFILE (N-1) - 402-N-1] --> P3[UPDATED PROFILE (3) - 402-3]
    B3 --> B2[204-2 - SUBSCRIBER (2) BURST]
    P3 --> P2[UPDATED PROFILE (2) - 402-2]
    B2 --> B1
    P2 --> P1
    B1 --> B0[204-1 - SUBSCRIBER (1) BURST]
    P1 --> P0[UPDATED PROFILE (1) - 402-1]
    B0 --> RI[302/304 - RECEIVER INPUT]
    P0 --> RI
    RI --> M[MODEM]
    M --> RDP[RECOVERED DATA PACKET - 404-1]
    RDP --> PD[PACKET DATA (N)]
    PD --> P4[UPDATED PROFILE (N) - 406]
    P4 --> C[314 - CONTROLLER]
  
```

(10) **Patent No.:** US 6,947,477 B2
(45) **Date of Patent:** Sep. 20, 2005

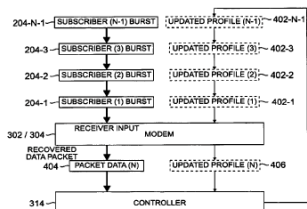
(52) **U.S. Cl.** 375/222; 375/224
(58) **Field of Search** 375/222; 370/314,
370/321, 347

(56) **References Cited**

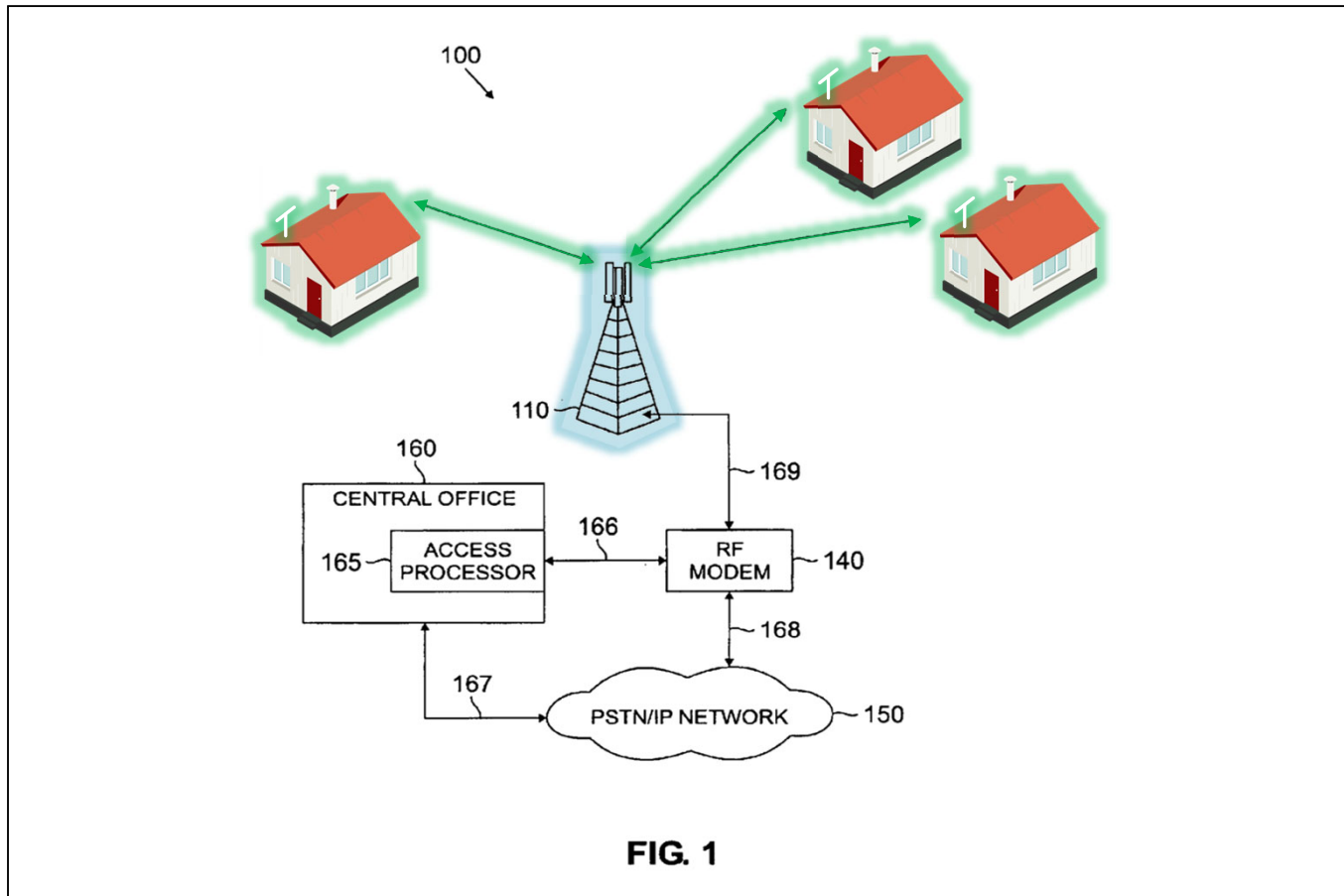
U.S. PATENT DOCUMENTS

5,793,753	A	8/1998	Hershey et al.	
5,832,365	A *	11/1998	Chen et al.	455/15
5,978,650	A	11/1999	Fischer et al.	455/3.1
6,222,858	B1 *	4/2001	Counterman	370/474
6,230,326	B1 *	5/2001	Unger et al.	725/111
6,320,903	B1 *	11/2001	Isaksson et al.	375/232
6,345,071	B1 *	2/2002	Hamdi	375/222
6,590,872	B1 *	7/2003	Shiue et al.	370/314
6,636,490	B1 *	10/2003	Johnson	370/328
6,654,384	B1 *	11/2003	Reza et al.	370/469
003/0002495	A1	1/2003	Shahar et al.	370/389

(22) Filed: Apr. 20, 2001

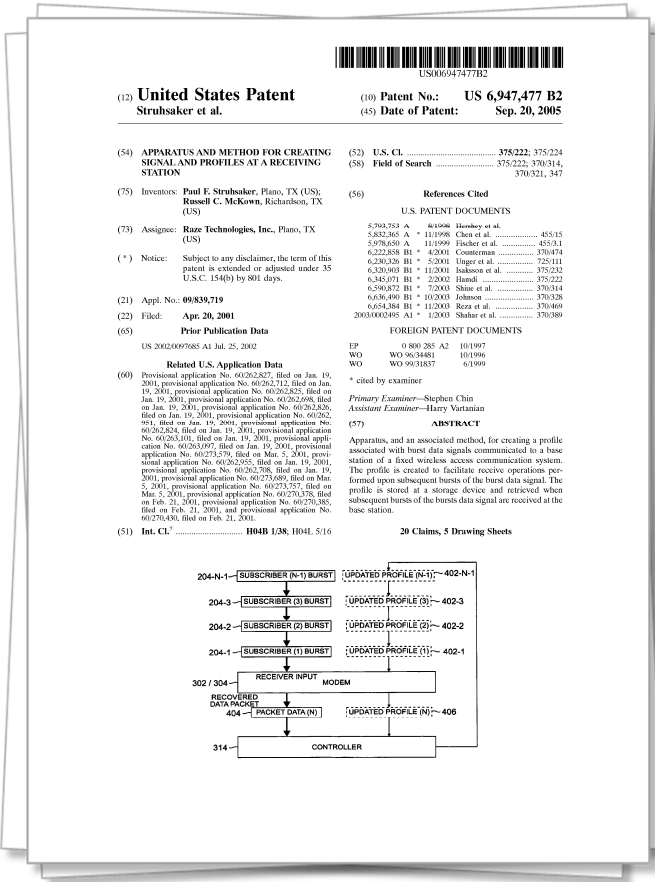


Background | Figure 1



Paper 1, p. 4

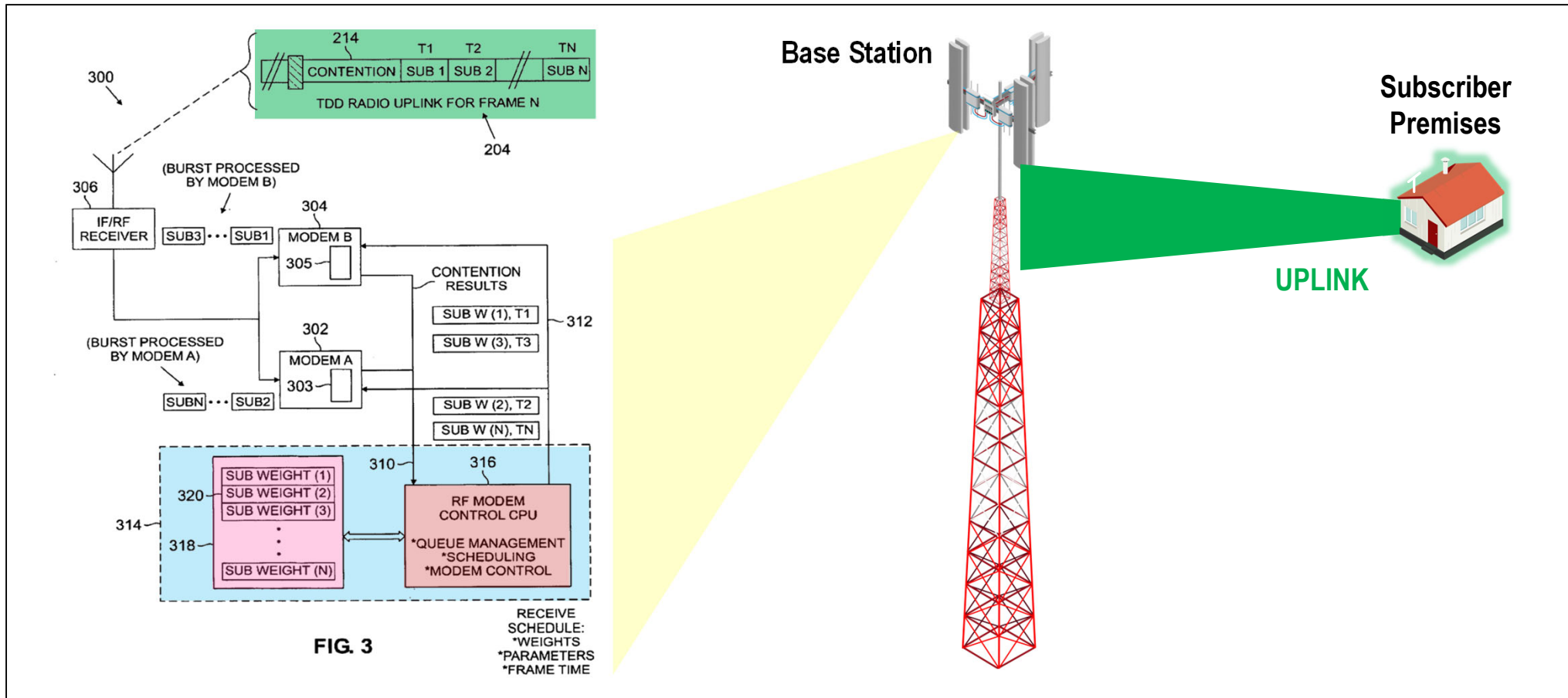
The '477 Patent's Alleged Invention



which the burst was transmitted. The parameters include, for instance, signal-related parameters and channel-related parameters. Signal-related parameters include, for instance, the amount of forward error correction (FEC) of the burst, change in frequency of the burst, changes in time of the burst, changes in power levels of the burst, etc. And, channel-related parameters include values of equalization weighting, antenna parameters, either at the subscriber station or at the base station, etc. The calculated parameters are

'477 Patent at 11:56-64; Paper 1, p. 7

The '477 Patent's Alleged Invention



Paper 1, pp. 7-8

The '477 Patent's Alleged Invention

