

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been
filed in the U.S. District Court District of Delaware on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.);

DOCKET NO.	DATE FILED 10/13/2022	U.S. DISTRICT COURT District of Delaware
PLAINTIFF Intellectual Ventures I LLC and Intellectual Ventures II LLC		DEPENDANT Hewlett Packard Enterprise Company
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 US 7,623,439 B2	11/24/2009	Intellectual Ventures I LLC
2 US RE44,706 E	1/14/2014	Intellectual Ventures II LLC
3 US 11,265,787 B2	3/1/2022	Intellectual Ventures II LLC
4		
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
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Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,623,439 B2
APPLICATION NO. : 11/121661
DATED : November 24, 2009
INVENTOR(S) : Mark A. Webster and Michael J. Seals

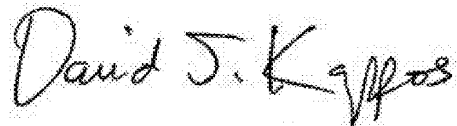
Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 8, Col. 10, Line 24:

Delete the word "die" and replace with --the--

Signed and Sealed this
Twenty-eighth Day of December, 2010

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive, flowing style.

David J. Kappos
Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,623,439 B2
APPLICATION NO. : 11/121661
DATED : November 24, 2009
INVENTOR(S) : Webster et al.

Page 1 of 1

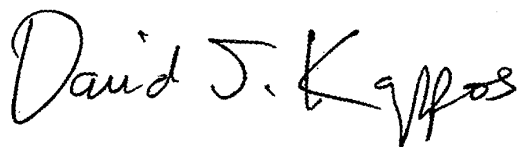
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page:

The first or sole Notice should read --

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b)
by 937 days.

Signed and Sealed this
Twenty-sixth Day of October, 2010

A handwritten signature in black ink, reading "David J. Kappos". The signature is written in a cursive, flowing style with a large initial "D" and a stylized "K".

David J. Kappos
Director of the United States Patent and Trademark Office



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/121,661	05/04/2005	Mark A. Webster	088245-2606

CONFIRMATION NO. 3553

POA ACCEPTANCE LETTER

23524
FOLEY & LARDNER LLP
150 EAST GILMAN STREET
P.O. BOX 1497
MADISON, WI 53701-1497



Date Mailed: 10/04/2010

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/24/2010.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/ttran/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/121,661	05/04/2005	Mark A. Webster	08-1424-US

CONFIRMATION NO. 3553

POWER OF ATTORNEY NOTICE

20306
MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606



Date Mailed: 10/04/2010

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/24/2010.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/tran/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☒ Practitioners associated with the Customer Number:**23524**

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☒ The address associated with Customer Number:**23524**

OR

☐ Firm or Individual Name

Address

City

State

Zip

Country

Telephone

Email

Assignee Name and Address:

XOCYST TRANSFER AG L.L.C.
 2711 Centerville Road
 Suite 400
 Wilmington, DE 19808
 USA

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/86 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	May 24, 2010
Name	Missia Coleman	Telephone	
Title	Authorized Person for Xocyst Transfer AG L.L.C.		

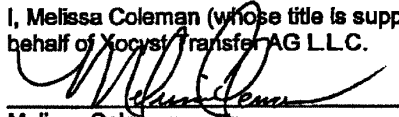
This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

MADI_2290389.1

DECLARATION REGARDING AUTHORITY TO SIGN ON BEHALF OF A LEGAL ENTITY
(37 C.F.R. 3.73(b)(2)(i))

I, Melissa Coleman (whose title is supplied below), hereby declare that I am authorized to sign on behalf of Xocyst Transfer AG LLC.



Melissa Coleman
Authorized Person for Xocyst Transfer AG LLC.

May 24, 2010
[date]

MADI_2290375.1

Electronic Acknowledgement Receipt	
EFS ID:	8483396
Application Number:	11121661
International Application Number:	
Confirmation Number:	3553
Title of Invention:	CYCLIC DIVERSITY SYSTEMS AND METHODS
First Named Inventor/Applicant Name:	Mark A. Webster
Customer Number:	20306
Filer:	Paul S. Hunter/Drew Lawson
Filer Authorized By:	Paul S. Hunter
Attorney Docket Number:	08-1424-US
Receipt Date:	24-SEP-2010
Filing Date:	04-MAY-2005
Time Stamp:	13:59:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		2606_POA.pdf	157948	yes	3
			8b8894a3af83c788a493831330423b997cd 87e52		

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Assignee showing of ownership per 37 CFR 3.73(b).	1	1
	Power of Attorney	2	3
Warnings:			
Information:			
Total Files Size (in bytes):		157948	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.			

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Mark A. WEBSTER et al

Application No./Patent No.: 11/121,661 / 7,623,439 Filed/Issue Date: 5/4/2005 / 11/24/2009

Attorney Docket Number: 088245-2606

Entitled: Cyclic diversity systems and methods

XOCYST TRANSFER AG L.L.C.
(Name of Assignee)

LLC
(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest;
2. ☐ an assignee of less than the entire right, title, and interest
(The extent (by percentage) of its ownership interest is %); or
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

in the patent application/patent identified above by virtue of either:

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel/Frame _____ or for which a copy thereof is attached.

OR

- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Mark A. WEBSTER et al To: CONEXANT SYSTEMS, INC.
The document was recorded in the United States Patent and Trademark Office at Reel 016541, Frame 0490, or for which a copy thereof is attached.

2. From: CONEXANT SYSTEMS, INC. To: XOCYST TRANSFER AG L.L.C.
The document was recorded in the United States Patent and Trademark Office at Reel 022043, Frame 0607, or for which a copy thereof is attached.

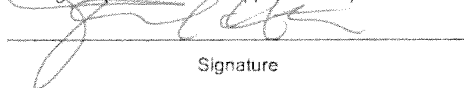
3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet.

- ☐ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE:] A separate copy (i.e., a true copy of the original document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.06]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.


Signature

9-23-10
Date

Paul S. Hunter (Reg. No. 44,787)

(608) 258-4292

Printed or Typed Name

Telephone Number

Attorney for Applicant

Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

4ADI_2303017.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Webster, et al.
Title: CYCLIC DIVERSITY SYSTEMS AND
METHODS
Patent. No.: 7,623,439
Issue Date: 11/24/2009
Examiner: DMITRY LEVITAN
Art Unit: 2416
Confirmation Number: 3553

**REQUEST FOR CERTIFICATE OF CORRECTION FOR
PTO MISTAKE PURSUANT TO 37 C.F.R. § 1.322(a)**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed, is a Certificate of Correction, Form PTO-1050, for United States Patent Number 7,623,439 issued November 24, 2009. The following Patent Office printing errors appear in the issued patent:

IN THE CLAIMS

Claim 8, Col. 10, Line 24:

Delete the word --die-- and replace with --the--

Applicant submits that the above changes would not constitute new matter, and correction thereof would not require reexamination.

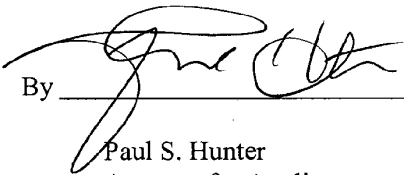
Pursuant to 37 C.F.R. §1.322, Applicant requests that the enclosed Certificate of Correction be approved.

Although Applicant believes that no fee is required for this Request, the Commissioner is hereby authorized to charge any additional fees which may be required for this Request to Deposit Account No. 19-0741.

Respectfully submitted,

Date July 14, 2010

FOLEY & LARDNER LLP
Customer Number: 23524
Telephone: (608) 258-4292
Facsimile: (608) 258-4258

By 

Paul S. Hunter
Attorney for Applicant
Registration No. 44,787

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.
(Also Form PTO-1050)

**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**

PATENT NO. : 7,623,439
APPLICATION NO. : 11/121,661
DATED : 11/24/2009
INVENTOR(S) : Mark A. Webster; Michael J. Seals

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

IN THE CLAIMS

Claim 8, Col. 10, Line 24:

Delete the word --die-- and replace with --the--

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Verex Plaza
150 East Gilman Street
Madison, Wisconsin 53703-1481

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer,

U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

MADI_2308783.1

Electronic Acknowledgement Receipt	
EFS ID:	8011598
Application Number:	11121661
International Application Number:	
Confirmation Number:	3553
Title of Invention:	CYCLIC DIVERSITY SYSTEMS AND METHODS
First Named Inventor/Applicant Name:	Mark A. Webster
Customer Number:	20306
Filer:	Paul S. Hunter/Lee Jankoski
Filer Authorized By:	Paul S. Hunter
Attorney Docket Number:	08-1424-US
Receipt Date:	14-JUL-2010
Filing Date:	04-MAY-2005
Time Stamp:	12:49:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	2606COC71410.pdf	71541	no	3
			a53659b48c0ec3b720991ce9b59e5d01e4c1aa8a		

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

MCDONNELL BOEHNNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606

Mail Date: 04/21/2010

Applicant	: Mark A. Webster	: DECISION ON REQUEST FOR
Patent Number	: 7623439	: RECALCULATION of PATENT
Issue Date	: 11/24/2009	: TERM ADJUSTMENT IN VIEW
Application No	: 11/121,661	: OF WYETH AND NOTICE OF INTENT TO
Filed	: 05/04/2005	: ISSUE CERTIFICATE OF CORRECTION
		:

The Request for Recalculation is **GRANTED** to the extent indicated.

The patent term adjustment has been determined to be **937** days. The USPTO will *sua sponte* issue a certificate of correction reflecting the amount of PTA days determined by the recalculation.

Prior to the issuance of the certificate of correction, the USPTO will afford patentee an opportunity to be heard and request reconsideration. Accordingly, patentee has **one month or thirty (30) days**, whichever is longer, to file a request for reconsideration of this patent term adjustment calculation. See 35 U.S.C. 154(b)(3)(B)(ii) and 37 CFR 1.322(a)(4). No extensions of time will be granted under 37 CFR 1.136.

Patentee should use document code PET.OP if electronically filing a request for reconsideration of this patent term adjustment calculation. The patentee must also include the information required by 37 CFR 1.705(b)(2) and the fee required by 37 CFR 1.18(e). If patentee does not file a timely request for reconsideration of this patent term adjustment calculation including the information required by 37 CFR 1.705(b)(2) and the fee required by 37 CFR 1.18(e), the USPTO will issue a certificate of correction reflecting the PTA determination noted above.

Patentee should be aware that in order to preserve the right to review in the United States District Court for the District of Columbia of the USPTO patent term adjustment determination, patentee must ensure that he or she also take the steps required under 35 U.S.C. 154(b)(4)(A) in a timely manner. Nothing in the request for recalculation should be construed as providing an alternative time frame for commencing a civil action under 35 U.S.C. 154(b)(4)(A).

Any questions concerning this decision should be directed to the Office of Patent Legal Administration at 571-272-7702.

REQUEST FOR RECALCULATION OF PATENT TERM ADJUSTMENT IN VIEW OF *WYETH**

Attorney Docket Number: 08-1424-US	Patent Number: 7,623,439
Filing Date (or 371(b) or (f) Date): May 4, 2005	Issue Date: November 24, 2009
First Named Inventor: Webster	
Title: Cyclic Diversity Systems and Methods	
PATENTEE HEREBY REQUESTS RECALCULATION OF THE PATENT TERM ADJUSTMENT (PTA) UNDER 35 USC 154(b) INDICATED ON THE ABOVE-IDENTIFIED PATENT. THE PATENTEE'S SOLE BASIS FOR REQUESTING THE RECALCULATION IS THE USPTO'S PRE-WYETH INTERPRETATION OF 35 U.S.C. 154(b)(2)(A). Note: This form is only for requesting a recalculation of PTA for patents issued before March 2, 2010, if the sole basis for requesting the recalculation is the USPTO's pre-Wyeth interpretation of 35 U.S.C. 154(b)(2)(A). See Instruction Sheet on page 2 for more information. Patentees are reminded that to preserve the right to review in the United States District Court for the District of Columbia of the USPTO's patent term adjustment determination, a patentee must ensure that he or she also takes the steps required under 35 U.S.C. 154(b)(3) and (b)(4) and 37 CFR 1.705 in a timely manner. *Wyeth v. Kappos, No. 2009-1120 (Fed. Cir., Jan. 7, 2010).	

Signature /Thomas J. Loos/	Date January 29, 2010
Name (Print/Typed) Thomas J. Loos	Registration Number 60161
<i>Note: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required in accordance with 37 CFR 1.33 and 11.18. Please see 37 CFR 1.4(d) for the form of the signature. If necessary, submit multiple forms for more than one signature, see below*.</i>	
☒ *Total of <u>1</u> forms are submitted.	

The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt	
EFS ID:	6915020
Application Number:	11121661
International Application Number:	
Confirmation Number:	3553
Title of Invention:	CYCLIC DIVERSITY SYSTEMS AND METHODS
First Named Inventor/Applicant Name:	Mark A. Webster
Customer Number:	20306
Filer:	Thomas J. Loos
Filer Authorized By:	
Attorney Docket Number:	08-1424-US
Receipt Date:	29-JAN-2010
Filing Date:	04-MAY-2005
Time Stamp:	21:18:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for PTA recalculation in view of Wyeth	08-1424-US_SB_131.pdf	36393 6e5445f71eda61f87a25be49fe2337fcd2cc a99	no	1

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/121,661	11/24/2009	7623439	08-1424-US	3553

20306 7590 11/04/2009
MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 686 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Mark A. Webster, Indian Harbor Beach, FL;
Michael J. Seals, Melbourne, FL;

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

20306 7590 08/21/2009

MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/121,661	05/04/2005	Mark A. Webster	08-1424-US	3553

TITLE OF INVENTION: CYCLIC DIVERSITY SYSTEMS AND METHODS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	11/23/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
LEVITAN, DMITRY	2416	370-203000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.	2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.	McDonnell Boennen 1 ~~Hulbert & Berghoff LLP~~ 2 _____ 3 _____
---	--	---

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY AND STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee
- ☒ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies -0-

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 13-2490 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Daniel R. Bestor/

Typed or printed name Daniel R. Bestor

Date October 12, 2009

Registration No. 58,439

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Electronic Patent Application Fee Transmittal				
Application Number:	11121661			
Filing Date:	04-May-2005			
Title of Invention:	CYCLIC DIVERSITY SYSTEMS AND METHODS			
First Named Inventor/Applicant Name:	Mark A. Webster			
Filer:	Daniel Robert Bestor/Lucy Ponce de Leon			
Attorney Docket Number:	08-1424-US			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1510	1510
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1810

Electronic Acknowledgement Receipt	
EFS ID:	6242181
Application Number:	11121661
International Application Number:	
Confirmation Number:	3553
Title of Invention:	CYCLIC DIVERSITY SYSTEMS AND METHODS
First Named Inventor/Applicant Name:	Mark A. Webster
Customer Number:	20306
Filer:	Daniel Robert Bestor
Filer Authorized By:	
Attorney Docket Number:	08-1424-US
Receipt Date:	12-OCT-2009
Filing Date:	04-MAY-2005
Time Stamp:	15:01:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$1810
RAM confirmation Number	9565
Deposit Account	132490
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	08-1424-US_IssueFeePayment.pdf	207383	no	1
			21c4f3f1e5eadf975be3fafa2ff1ccfb7b9e5a11		

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	31998	no	2
			83995a91307263ecd71faf57468423ea10b35a4		

Warnings:

Information:

Total Files Size (in bytes): 239381

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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NOTICE OF ALLOWANCE AND FEE(S) DUE

20306 7590 08/21/2009

MCDONNELL BOEHNEN HULBERT & BERGHOF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606

EXAMINER

LEVITAN, DMITRY

ART UNIT

PAPER NUMBER

2416

DATE MAILED: 08/21/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/121,661	05/04/2005	Mark A. Webster	08-1424-US	3553

TITLE OF INVENTION: CYCLIC DIVERSITY SYSTEMS AND METHODS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	11/23/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

20306 7590 08/21/2009

MCDONNELL BOEHNNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/121,661	05/04/2005	Mark A. Webster	08-1424-US	3553

TITLE OF INVENTION: CYCLIC DIVERSITY SYSTEMS AND METHODS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	11/23/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
LEVITAN, DMITRY	2416	370-203000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.	2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____ (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____ 3 _____
---	---

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/121,661	05/04/2005	Mark A. Webster	08-1424-US	3553
20306	7590	08/21/2009	EXAMINER	
MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP			LEVITAN, DMITRY	
300 S. WACKER DRIVE			ART UNIT	
32ND FLOOR			PAPER NUMBER	
CHICAGO, IL 60606			2416	
DATE MAILED: 08/21/2009				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 686 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 686 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Amendment, filed 6/09/09, has been entered.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Daniel R. Bestor on 7/31/09.

The application has been amended as follows:

Claims 24, 32 and 44 have been amended per Attachment A.

Note. Claims have been amended to avoid reading on Larsson (US 6,842,487).

Allowable Subject Matter

2. Claims 24-26, 28-38 and 40-46 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dmitry Levitan whose telephone number is (571) 272-3093. The examiner can normally be reached on 8:30 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dmitry Levitan
Primary Examiner
Art Unit 2416

/Dmitry Levitan/
Primary Examiner, Art Unit 2416

<i>Index of Claims</i> 	Application/Control No. 11121661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.
	Examiner Dmitry Levitan	Art Unit 2416

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.D.
 ☐ R.1.47

CLAIM		DATE									
Final	Original	05/16/2008	10/23/2008	02/27/2009	08/03/2009						
	1	✓	✓	-	-						
	2	✓	✓	-	-						
	3	✓	✓	-	-						
	4	✓	✓	-	-						
	5	✓	✓	-	-						
	6	✓	✓	-	-						
	7	✓	✓	-	-						
	8	✓	✓	-	-						
	9	✓	✓	-	-						
	10	✓	✓	-	-						
	11	✓	✓	-	-						
	12	✓	✓	-	-						
	13	✓	✓	-	-						
	14	✓	✓	-	-						
	15	✓	✓	-	-						
	16	✓	✓	-	-						
	17	✓	✓	-	-						
	18	✓	✓	-	-						
	19	✓	✓	-	-						
	20	✓	✓	-	-						
	21	✓	✓	-	-						
	22	✓	✓	-	-						
	23	✓	✓	-	-						
1	24			✓	=						
2	25			✓	=						
3	26			✓	=						
	27			✓	-						
4	28			✓	=						
7	29			✓	=						
5	30			✓	=						
6	31			✓	=						
8	32			✓	=						
9	33			✓	=						
10	34			✓	=						
11	35			✓	=						
12	36			✓	=						

<i>Index of Claims</i> 	Application/Control No. 11121661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.
	Examiner Dmitry Levitan	Art Unit 2416

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant						☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE									
Final	Original	05/16/2008	10/23/2008	02/27/2009	08/03/2009						
13	37			✓	=						
14	38			✓	=						
	39			✓	-						
15	40			✓	=						
16	41			✓	=						
17	42			✓	=						
18	43			✓	=						
19	44			✓	=						
20	45			✓	=						
21	46			✓	=						

Issue Classification 	Application/Control No. 11121661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.
	Examiner Dmitry Levitan	Art Unit 2416

ORIGINAL						INTERNATIONAL CLASSIFICATION												
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED							
370			203			H	0	4	J	11 / 00 (2006.01.01)								
CROSS REFERENCE(S)																		
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																	

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17	9	33										
	2		18	10	34										
	3		19	11	35										
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	9	2	25	16	41										
	10	3	26	17	42										
	11		27	18	43										
	12	4	28	19	44										
	13	7	29	20	45										
	14	5	30	21	46										
	15	6	31												
	16	8	32												

NONE		Total Claims Allowed:	
		21	
(Assistant Examiner)	(Date)		
/Dmitry Levitan/ Primary Examiner.Art Unit 2416	8/03/09	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	8

<i>Search Notes</i> 	Application/Control No. 11121661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.
	Examiner Dmitry Levitan	Art Unit 2416

SEARCHED			
Class	Subclass	Date	Examiner
370	203-210, 310, 342-345	8/03/09	DL
455	562, 101	8/03/09	DL

SEARCH NOTES		
Search Notes	Date	Examiner
IEEE, EAST	8/03/09	DL

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
370	203	8/03/09	DL

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EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	26	ofdm and ((shift\$5 or advanc\$5) near2 (samples or symbols) and (guard near2 interval)).clm.	US-PGPUB; USPAT	OR	ON	2009/08/03 14:16
L4	39	ofdm and ((shift\$5 or advanc\$5 or mov\$5 or dela\$6) near2 (samples or symbols) and ((sample or symbol) near2 (length or duration or timing)) and (guard near2 interval)).clm.	US-PGPUB; USPAT	OR	ON	2009/08/03 14:23

8/ 3/ 09 2:27:55 PM

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AMENDMENTS TO CLAIMS

1-23. (Canceled)

24. (Currently Amended) A method for transmitting orthogonal frequency division multiplexing (OFDM) signals comprising:

generating a first OFDM packet for transmission including a guard interval portion and a symbol data portion each comprised of a plurality of samples;

cyclically advancing the first OFDM packet by shifting the samples in a first direction an amount less than a sample duration of the guard interval portion to generate a shifted version of the first OFDM packet for transmission in which at least a non-zero number of the samples from the symbol data portion of the first OFDM packet are shifted into the guard interval portion of the shifted version and a same non-zero number of samples from the guard interval portion of the first OFDM packet are shifted out of the guard interval portion of the shifted version; and

substantially simultaneously transmitting the first OFDM packet and the shifted version of the OFDM packet ~~,- wherein during a period in which the guard interval portion of the first OFDM packet is being transmitted, the shifted version of the OFDM packet transmits the first 'n' samples of the symbol data portion of the first OFDM packet, where 'n' is equal to the amount of shift of the shifted version of the OFDM packet relative to the first OFDM packet.~~

25. (Previously Presented) The method of claim 24, further comprising cyclically advancing the OFDM packet for a duration of less than approximately 800 nanoseconds.

26. (Previously Presented) The method of claim 24, further comprising cyclically advancing the OFDM packet for a duration of less than one half of the sample duration of the guard interval portion.

27. (Canceled)

28. (Previously Presented) The method of claim 24, further comprising a legacy receiver, and wherein the cyclical advancements of the shifted version of the OFDM packet cause the legacy receiver to produce a plurality of impulse responses in an acquisition process, and wherein each of the first OFDM packet and the shifted version of the OFDM packet corresponds to one of the plurality of impulse responses.

29. (Previously Presented) The method of claim 24, further comprising transmitting the first OFDM packet and the shifted version of the OFDM packet from a multiple-antenna transmitter device.

30. (Previously Presented) The method of claim 28, wherein an impulse response corresponding to the shifted version of the OFDM packet occurs earlier in time than an impulse response corresponding to the first OFDM packet.

31. (Previously Presented) The method of claim 28, wherein the legacy OFDM receiver is a single-input, single-output (SISO) receiver device.

32. (Currently Amended) A signal transmitting system for transmitting orthogonal frequency division multiplexing (OFDM) signals comprising:

a first transmit processor for generating a first OFDM packet for transmission including a guard interval portion and a symbol data portion each compromised of a plurality of samples;

a second transmit processor for cyclically advancing the first OFDM packet by shifting the samples in a first direction an amount less than a sample duration of the guard interval portion to generate a shifted version of the first OFDM packet for transmission in which at least a non-zero number of the samples from the symbol data portion of the first OFDM packet are shifted into the guard interval portion of the shifted version and a same non-zero number of samples from the guard interval portion of the first OFDM packet are shifted out of the guard interval portion of the shifted version;

a plurality of radio transmitters for converting the OFDM packet and the shifted version of the OFDM packet to corresponding radio signals; and

a plurality of radio antennas correspondingly coupled to the plurality of radio transmitters for transmitting the radio signals;

wherein the first transmit processor and the second transmit processor are configured to substantially simultaneously cause the transmission of the first OFDM packet and the shifted version of the OFDM packet via corresponding transmitters and antennas ~~; wherein during a period in which the guard interval portion of the first OFDM packet is being transmitted, the shifted version of the OFDM packet transmits the first 'n' samples of the symbol data portion of the first OFDM packet, where 'n' is equal to the amount of shift of the shifted version of the OFDM packet relative to the first OFDM packet.~~

33. (Previously Presented) The system of claim 32, wherein each of the first and second transmit processors includes a cyclic extension module for performing cyclical advancements.

34. (Previously Presented) The system of claim 33, wherein each of the cyclic extension modules is configured to cyclically advance the OFDM packet for a duration of less than one half of sample duration of the guard interval.

35. (Previously Presented) The system of claim 33, wherein each of the cyclic extension modules is configured to cyclically advance the OFDM packet for a duration of less than approximately 800 nanoseconds.

36. (Previously Presented) The system of claim 32, wherein the first transmit processor is configured to receive incoming data and interleave the received data into a plurality of sub-carrier channels.

37. (Previously Presented) The system of claim 32, wherein each of the plurality of transmit processors further includes an Inverse Fast Fourier (IFFT) module for generating OFDM symbols from incoming data.

38. (Previously Presented) The system of claim 32, wherein the first and second transmit processors perform the cyclical advancements on baseband signals.

39. (Canceled)

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40. (Previously Presented) The system of claim 32, wherein the first and second transmit processors include application specific integrated circuits (ASICs).

41. (Previously Presented) The system of claim 32, wherein the transmitter is an 802.11 compliant device.

42. (Previously Presented) The system of claim 32, wherein the first and second transmit processors include field programmable gate arrays (FPGAs).

43. (Previously Presented) The system of claim 32, wherein the first and second transmit processors include firmware stored in a memory device and executed by a suitable instruction execution system.

44. (Currently Amended) A signal transmitting system for transmitting orthogonal frequency division multiplexing (OFDM) signals comprising:

means for generating a first OFDM packet for transmission including a guard interval portion and a symbol data portion each compromised of a plurality of samples;

means for cyclically advancing the first OFDM packet including a guard interval portion and a symbol data portion each compromised of a plurality of samples by shifting the samples in a first direction an amount less than a sample duration of the guard interval portion to generate a shifted version of the first OFDM packet for transmission in which at least a non-zero number of the samples from the symbol data portion of the first OFDM packet are shifted into the guard

interval portion of the shifted version and a same non-zero number of samples from the guard interval portion of the first OFDM packet are shifted out of the guard interval portion of the shifted version;

means for converting the first OFDM packet and the shifted version of the OFDM packet to corresponding radio signals; and

means for substantially simultaneously causing the transmission of the first OFDM packet and the shifted version of the OFDM packet, ~~wherein during a period in which the guard interval portion of the first OFDM packet is being transmitted, the shifted version of the OFDM packet transmits the first 'n' samples of the symbol data portion of the first OFDM packet, where 'n' is equal to the amount of shift of the shifted version of the OFDM packet relative to the first OFDM packet.~~

45. (Previously Presented) The system of claim 44, wherein the cyclic advance has a duration less than one of half of sample duration of the guard interval of the OFDM packet.

46. (Previously Presented) The system of claim 44, further comprising a legacy receiver, and wherein the cyclical advancements of the shifted version of the OFDM packet cause the legacy receiver to produce a plurality of impulse responses in an acquisition process, and wherein each of the first OFDM packet and the shifted version of the OFDM packet corresponds to one of the plurality of impulse responses.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Attorney Docket No. 08-1424-US)**

In the Application of:	)	
	)	
Mark A. Webster et al.	)	
	)	Examiner: Dmitry Levitan
Serial No.: 11/121,661	)	
	)	Group Art Unit: 2416
Filing Date: May 4, 2005	)	
	)	Confirmation No.: 3553
For: Cyclic Diversity Systems And	)	
Methods	)	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

Dear Sir:

In response to the Office Action mailed on March 9, 2009, Applicants respectfully submit the following Amendments to Claims with Remarks.

Amendments to Claims begin on page 2;

Remarks begin on page 8 of this paper.

AMENDMENTS TO CLAIMS

1-23. (Canceled)

24. (Currently Amended) A method for transmitting orthogonal frequency division multiplexing (OFDM) signals ~~to a legacy OFDM receiver that aligns a Fast Fourier Transform (FFT) window based on detecting shifted versions of the OFDM signals,~~ comprising:

generating ~~an~~ a first OFDM packet for transmission including a guard interval portion and a symbol data portion each comprised of a plurality of samples;

cyclically advancing the first OFDM packet by shifting the samples in a first direction an amount less than a sample duration of the guard interval portion to generate ~~one or more~~ a shifted ~~version~~ ~~versions~~ of the first OFDM packet for transmission; and

substantially simultaneously transmitting the first OFDM packet and the ~~one or more~~ shifted ~~version~~ ~~versions~~ of the OFDM packet ~~to the legacy OFDM receiver,~~ wherein during a period in which the guard interval portion of the first OFDM packet is being transmitted, the shifted version of the OFDM packet transmits the first 'n' samples of the symbol data portion of the first OFDM packet, where 'n' is equal to the amount of shift of the shifted version of the OFDM packet relative to the first OFDM packet ~~wherein the cyclical advancements of the one or more shifted versions of the OFDM packet cause an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet.~~

25. (Previously Presented) The method of claim 24, further comprising cyclically advancing the OFDM packet for a duration of less than approximately 800 nanoseconds.

26. (Currently Amended) The method of claim 24, further comprising cyclically advancing the OFDM packet for a duration of less than one half of ~~[[a]]~~ the sample duration of the guard interval portion.

27. (Canceled)

28. (Currently Amended) The method of claim 24, further comprising a legacy receiver, and wherein the cyclical advancements of the ~~one or more~~ shifted ~~versions~~ version of the OFDM packet cause the legacy receiver to produce a plurality of ~~impulsive~~ impulse responses in an acquisition process, and wherein each of the first OFDM packet and ~~one or more~~ the shifted version of the OFDM packet corresponds to one of the plurality of ~~impulsive~~ impulse responses.

29. (Currently Amended) The method of claim 24, further comprising transmitting the first OFDM packet and the ~~one or more~~ shifted ~~versions~~ version of the OFDM packet from a multiple-antenna transmitter device.

30. (Currently Amended) The method of claim ~~[[29]]~~ 28, wherein ~~the an~~ impulse ~~responses~~ response corresponding to the ~~one or more~~ shifted version of the OFDM packet ~~occur~~ occurs earlier in time than ~~the an~~ impulse ~~responses~~ response corresponding to the first OFDM packet.

31. (Currently Amended) The method of claim ~~[[24]]~~ 28, wherein the legacy OFDM receiver is a single-input, single-output (SISO) receiver device.

32. (Currently Amended) A signal transmitting system for transmitting orthogonal frequency division multiplexing (OFDM) signals ~~to a legacy OFDM receiver that aligns a Fast Fourier Transform (FFT) window based on detecting shifted versions of the OFDM signals,~~ comprising:

a first transmit processor for generating a first OFDM packet for transmission including a guard interval portion and a symbol data portion each compromised of a plurality of samples;

a ~~plurality of~~ second transmit processor for cyclically advancing the first OFDM packet by shifting the samples in a first direction an amount less than a sample duration of the guard interval portion to generate one or more a shifted versions version of the first OFDM packet for transmission;

a plurality of radio transmitters for converting the OFDM packet and the ~~one or more~~ shifted ~~versions~~ version of the OFDM packet to corresponding radio signals; and

a plurality of radio antennas ~~connected~~ correspondingly coupled to the plurality of radio transmitters for transmitting the radio signals ~~to the legacy OFDM receiver, wherein the cyclical advancements of the one or more shifted versions of the OFDM packet cause an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet~~

wherein the first transmit processor and the second transmit processor are configured to substantially simultaneously cause the transmission of the first OFDM packet and the shifted version of the OFDM packet via corresponding transmitters and antennas, wherein during a period in which the guard interval portion of the first OFDM packet is being transmitted, the shifted version of the OFDM packet transmits the first 'n' samples of the symbol data portion of the first OFDM packet, where 'n' is equal to the amount of shift of the shifted version of the OFDM packet relative to the first OFDM packet.

33. (Currently Amended) The system of claim 32, wherein each of the ~~plurality of~~ first and second transmit ~~processor~~ processors includes a cyclic extension module for performing ~~the~~ cyclical advancements.

34. (Currently Amended) The system of claim 33, wherein each of the cyclic extension modules is configured to cyclically advance the OFDM packet for a duration of less than one half of sample duration of the guard interval.

35. (Previously Presented) The system of claim 33, wherein each of the cyclic extension modules is configure to cyclically advance the OFDM packet for a duration of less than approximately 800 nanoseconds.

36. (Previously Presented) The system of claim 32, wherein the first transmit processor is configured to receive incoming data and interleave the received data into a plurality of sub-carrier channels.

37. (Previously Presented) The system of claim 32, wherein each of the plurality of transmit processors further includes an Inverse Fast Fourier (IFFT) module for generating OFDM symbols from incoming data.

38. (Currently Amended) The system of claim ~~[[9]]~~ 32, wherein the ~~plurality of~~ first and second transmit processors perform the cyclical advancements on baseband signals.

39. (Canceled)

40. (Currently Amended) The system of claim 32, wherein the first and second transmit ~~processor and the plurality of transmit~~ processors include application specific integrated circuits (ASICs).

41. (Previously Presented) The system of claim 32, wherein the transmitter is an 802.11 compliant device.

42. (Currently Amended) The system of claim 32, wherein the first and second transmit ~~processor and the plurality of transmit~~ processors include field programmable gate arrays (FPGAs).

43. (Currently Amended) The system of claim 32, wherein the first and second transmit ~~processor and the plurality of transmit processor~~ processors include firmware stored in a memory device and executed by a suitable instruction execution system.

44. (Currently Amended) A signal transmitting system for transmitting orthogonal frequency division multiplexing (OFDM) signals ~~to a legacy OFDM receiver that aligns a Fast Fourier Transform (FFT) window based on detecting shifted versions of the OFDM signals, comprising:~~

means for generating a first OFDM packet for transmission including a guard interval portion and a symbol data portion each compromised of a plurality of samples;

means for cyclically advancing the first OFDM packet including a guard interval portion and a symbol data portion each compromised of a plurality of samples by shifting the samples in a first direction an amount less than a sample duration of the guard interval portion to generate ~~one or more~~ a shifted versions version of the first OFDM packet for transmission;

means for converting the first OFDM packet and the ~~one or more~~ shifted versions version of the OFDM packet to corresponding radio signals; and

means for ~~transmitting the radio signals to the legacy OFDM receiver, wherein the cyclical advancements of the one or more shifted versions of the OFDM packet cause an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet substantially simultaneously causing the transmission of the first OFDM packet and the shifted version of the OFDM packet, wherein during a period in which the guard interval portion of the first OFDM packet is being transmitted, the shifted version of the OFDM packet transmits the first 'n' samples of the symbol data portion of the first OFDM packet, where 'n' is equal to the amount of shift of the shifted version of the OFDM packet relative to the first OFDM packet.~~

45. (Currently Amended) The system of claim 44, wherein the cyclic advance has a duration less than one of half of sample duration of the ~~[[a]]~~ guard interval of the OFDM packet.

46. (Currently Amended) The system of claim 44, further comprising a legacy receiver, and wherein the cyclical advancements of the ~~one or more~~ shifted versions version of the OFDM packet cause the legacy receiver to produce a plurality of ~~impulsive~~ impulse responses in an acquisition process, and wherein each of the first OFDM packet and ~~one or more~~ the shifted version of the OFDM packet corresponds to one of the plurality of ~~impulsive~~ impulse responses.

REMARKS

1. Summary of the Office Action

In the Office Action mailed on March 9, 2009, the Examiner rejected claims 24-46 under 35 U.S.C. 112, first paragraph, rejected claims 30 and 38 under 35 U.S.C. § 112, second paragraph, rejected claims 24, 26-34, 36-39, 41, and 44-46 under 35 U.S.C. 103(a) as being unpatentable over Larsson (U.S. Patent No. 6,842,487), in view of Admitted Prior Art.

2. Status of Claims

Applicants have amended independent claims 24, 32, and 44, and dependent claims 26, 28-31, 33-34, 38, 40, 42, 43, 45, and 46. Claims 27 and 39 have been canceled. Currently pending claims are claims 24-26, 28-38, and 40-46, of which claims 24, 32, and 44 are in independent form and the remaining claims are in dependent form. No new matter is added.

3. Response to Rejections under 35 U.S.C. 112, First Paragraph

As noted above, in the Office Action mailed on March 9, 2009, the Examiner rejected independent claims 24-46 under U.S.C. 112, first paragraph as failing to comply with the written description requirement.

Specifically regarding claims 24, 32, and 44, Applicants submit that the cited claim element “cause an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet” has been removed in light of the current amendments to the claims. In light of the forgoing, Applicants submit that the Examiner rejection under 35 U.S.C. § 112, first paragraph, is moot and should be withdrawn.

Specifically regarding claims 26, 34, and 45, Applicants submit that the specification enables the entire range of duration less than a guard interval, and are entitled to claim any portion of such range. See, for example, the Abstract of the specification, paragraph [0015], and

paragraph [0040], all of which describe and enable a cyclic advance of less than the guard interval, which necessarily includes the range of “less than one half of a guard interval.”

4. Response to Rejections under 35 U.S.C. 112, Second Paragraph

As noted above, in the Office Action mailed on March 9, 2009, the Examiner rejected claims 30 and 38 under U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants submit that the rejection is rendered moot by the present amendments, which have clarified the language of claims 30 and 38.

5. Response to Rejections under 35 U.S.C. 103(a)

As noted above, in the Office Action mailed on March 9, 2009, the Examiner rejected claims 24, 26-34, 36-39, 41, and 44-46 under 35 U.S.C. 103(a) as being unpatentable over Larsson in view of APA.

Applicants have now submitted new claims 24, 32, and 44 and respectfully submit that Larsson, alone or in combination with APA, fails to teach or disclose the subject matter as now set forth in claims 24, 32, and 44.

Specifically, claim 24 recites “generating a first OFDM packet for transmission including a guard interval portion and a symbol data portion each comprised of a plurality of samples; cyclically advancing the first OFDM packet by shifting the samples in a first direction an amount less than a sample duration of the guard interval portion to generate a shifted version of the first OFDM packet for transmission; and substantially simultaneously transmitting the first OFDM packet and the shifted version of the OFDM packet, wherein during a period in which the guard interval portion of the first OFDM packet is being transmitted, the shifted version of the OFDM packet transmits the first ‘n’ samples of the symbol data portion of the first OFDM packet, where

‘n’ is equal to the amount of shift of the shifted version of the OFDM packet relative to the first OFDM packet.”

The Larsson reference fails to suggest or disclose every element of the claims, as amended. Larsson describes applying a “cyclic delay” to an OFDM symbol by “shifting samples from the end of the OFDM symbol into the beginning of the OFDM symbol and adding a cyclic prefix by copying the last n samples of the OFDM symbol.” See Larsson, column 6, lines 45-49 and Figure 8. Larsson, however, does not appear to suggest the “cyclical advancements” be applied to the OFDM packet as set forth in claim 24 and Fig. 8. In fact, as described in the specification, the “cyclic delay” described by Larsson would cause the legacy receiver to shift the FFT window into the subsequent symbol and thereby cause intersymbol interference since the intentional cyclic delay is “indistinguishable from the sample shifting that occurs in linear delay diversity” from the receiver standpoint.

On the contrary, during the acquisition process of the claimed invention, the cyclical advancement as set forth in claim 24 would cause the impulse responses corresponding to the shifted versions of the OFDM packet to occur before the impulse response of the unshifted OFDM packet, thereby preventing the erroneous alignment of the FFT window. This is due to the directional shift as set forth in Fig. 8, in which the first OFDM packet 804 is left shifted such that a first ‘n’ number of samples (0-3 in Fig. 8) of the OFDM data portion 812 of the first OFDM packet 804 are cyclically shifted such that, during a time period in which the guard interval portion 810 of the first OFDM packet 804 is being transmitted, at least a portion of the first OFDM data portion 812 is being transmitted in the shifted OFDM packet 806.

As set forth in paragraph [0043], “testing has shown that legacy radios show significant performance gains in packet error rate with small advancements...as opposed to large delays.”

As set forth in the specification and Fig. 8, an “advancement” is defined as a left shift of the OFDM packet samples.

Specifically in terms of claim 1 and Fig. 8 of Larsson, Larsson fails to disclose “wherein during a period in which the guard interval portion of the first OFDM packet is being transmitted, the shifted version of the OFDM packet transmits the first ‘n’ samples of the symbol data portion of the first OFDM packet, where ‘n’ is equal to the amount of shift of the shifted version of the OFDM packet relative to the first OFDM packet.”

In fact, Larsson specifically teaches that the samples of the cyclic prefix CP are taken from end of the OFDM symbol data 820.

As set forth on pages 3-4 of the Office Action, the Examiner exclusively relied upon Larsson for every claim element except for the claim element relating to the use of a “legacy OFDM receiver,” the latter of which the Examiner cited APA. For the reasons set forth above, Applicants submit that the claim elements of claim 24 are not disclosed or taught by Larsson. Additionally, APA does not compensate for the failed teachings of Larsson.

Because the Examiner has not provided evidence which as a whole shows that the legal determination sought to be proved (i.e., the reference teachings establish a prima facie case of obviousness) is more probable than not, Applicants submit that the Examiner’s rejection should be withdrawn. *MPEP §2142 rev. 6* (October 2007).

With respect to claims 32 and 44, Applicants point out that they include similar limitations of claim 24 and therefore are not rendered obvious by Larsson and APA for at least the same reasons set forth above. Therefore, Applicants respectfully submit that all claims are now in condition for allowance.

With respect to the remaining claims, Applicants point out that they depend from independent claims 24, 32, and 44 and therefore are not anticipated by Larsson for at least the same reasons set forth above.

6. Response to the Examiner's Response to Arguments

Applicants submit that the arguments set forth by the Examiner in the Response to Arguments section are moot in view of the attached Amendments to the Claims. Furthermore, and in light of the forgoing Arguments, Applicants submit that the Larsson reference fails to disclose, teach, or suggest the currently claimed invention, alone or in combination with APA.

7. Conclusion

In view of the above, Applicant submits that the application is in condition for allowance and respectfully requests the Examiner pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of this application, the Examiner is invited to call the undersigned attorney at 312-913-2125.

Respectfully submitted,

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP

Date: June 9, 2009

By: /Daniel R. Bestor/
Daniel R. Bestor
Registration No. 58,439

Electronic Acknowledgement Receipt	
EFS ID:	5478987
Application Number:	11121661
International Application Number:	
Confirmation Number:	3553
Title of Invention:	Cyclic diversity systems and methods
First Named Inventor/Applicant Name:	Mark A. Webster
Customer Number:	20306
Filer:	Daniel Robert Bestor
Filer Authorized By:	
Attorney Docket Number:	08-1424-US
Receipt Date:	09-JUN-2009
Filing Date:	04-MAY-2005
Time Stamp:	12:37:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		08-1424-US_Response.pdf	114250	yes	12
			654f775aa7a8493178ef82fc75bc882d65821c4b		

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Amendment Copy Claims/Response to Suggested Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	12
Warnings:			
Information:			
Total Files Size (in bytes):		114250	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.			

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 11/121,661		Filing Date 05/04/2005		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)			SMALL ENTITY ☐ OR		OTHER THAN SMALL ENTITY		
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =		OR	X \$ =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =			X \$ =				
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.										
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	06/09/2009	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 21	Minus	** 23	= 0	X \$ =		OR	X \$2= 0	
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X \$ =		OR	X \$220= 0	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =		OR	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =		OR	X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
	* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.									

Legal Instrument Examiner:
/BRENDA HARRISON/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
11/121,661	05/04/2005	2416	1150	050337-1020	23	3

CONFIRMATION NO. 3553

CORRECTED FILING RECEIPT



OC000000034313621

20306
MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606

Date Mailed: 03/13/2009

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Mark A. Webster, Indian Harbor Beach, FL;
Michael J. Seals, Melbourne, FL;

Assignment For Published Patent Application

Conexant Systems, Inc., Newport Beach, CA

Power of Attorney: The patent practitioners associated with Customer Number 20306

Domestic Priority data as claimed by applicant

This appln claims benefit of 60/572,481 05/20/2004

Foreign Applications

If Required, Foreign Filing License Granted: 05/26/2005

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 11/121,661**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

Title

Cyclic diversity systems and methods

Preliminary Class

370

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER**Title 35, United States Code, Section 184****Title 37, Code of Federal Regulations, 5.11 & 5.15****GRANTED**

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set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/121,661	05/04/2005	Mark A. Webster	050337-1020

CONFIRMATION NO. 3553

POA ACCEPTANCE LETTER

20306
MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606



Date Mailed: 03/11/2009

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/27/2009.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/dpnash/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/121,661	05/04/2005	Mark A. Webster	050337-1020

CONFIRMATION NO. 3553

POWER OF ATTORNEY NOTICE

20306
MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606



Date Mailed: 03/11/2009

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/27/2009.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/dpnash/

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/121,661	05/04/2005	Mark A. Webster	050337-1020	3553
20306 7590 03/09/2009 MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP 300 S. WACKER DRIVE 32ND FLOOR CHICAGO, IL 60606			EXAMINER LEVITAN, DMITRY	
			ART UNIT 2416	PAPER NUMBER
			MAIL DATE 03/09/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 11/121,661		Applicant(s) WEBSTER ET AL.	
	Examiner Dmitry Levitan		Art Unit 2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 27 January 2009.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 24-46 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 24-46 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Amendment, filed 1/27/09, has been entered. Claims 24-46 remain pending.

Claim Rejections - 35 USC § 112

1. Claims 24-46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 24, 32 and 44 limitations, directed to “cause an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet” are not supported by the original disclosure.

Cited portion of the specification, [0041], contains no disclosure of FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet.

Claims 26, 34 and 45 limitations, directed to advancing the OFDM packet for a duration of less than one half of a guard interval" are not supported by the disclosure, as filed.

Other claims are rejected as the claims depending on the claims rejected above.

2. In light of Applicant’s amendment, the rejection of claims 1-23 under 35 U.S.C. 112, second paragraph, set in the previous Office action, has been withdrawn.

Claims limitations, directed to “cyclical advancing of OFDM packet” are understood as shifting a portion of the OFDM packet from it’s end to the packet’s beginning.

3. Claims 30 and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 30 recites the limitation "the impulse responses" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 38 is incomplete, because it depends on claim 9, which has been cancelled.

Claim Rejections - 35 USC § 103

4. Claims 24, 26-34, 36-39, 41 and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson (US 6,842,487) in view of Admitted Prior Art (Current application, Fig. 1-5 and pages 1-7).

5. Regarding claims 24, 31, 32 and 44, Larsson substantially teaches the limitations of claims:

A method and a system for transmitting orthogonal frequency division multiplexing (OFDM) signals to an OFDM receiver (OFDM transmit and receive system, as shown on Fig. 9 and disclosed on 6:58-7:37), comprising:

generating an OFDM packet for transmission (generating OFDM symbol for transmission, as disclosed on 6:58-64);

cyclically advancing the OFDM packet to generate one or more shifted versions of the OFDM packet for transmission (shifting a portion of OFDM symbol from the end of the symbol to the

symbol beginning, as shown on Fig. 8 and disclosed on 6:39-57); and transmitting the OFDM packet and the one or more shifted versions of the OFDM packet to the OFDM receiver (transmitting 1-M shifted versions of the OFDM symbol as shown on Fig. 9 and disclosed on 7:6-13), wherein the cyclical advancements of the one or more shifted versions of the OFDM packet cause an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet (aligning OFDM n-1, n and n+1 symbols with corresponding FFT windows, as shown on Fig. 9).

Larsson does not teach using legacy SISO receiver.

Admitted Prior Art teaches using a SISO receiver, as shown on Fig. 1 and disclosed on pages 2, 5 and 6.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using legacy SISO receiver of Admitted Prior Art to the system of Larsson to improve the system compatibility with existing SISO receivers.

In addition, regarding claims 32 and 44, Larsson teaches:
a first transmit processor/means for generating a OFDM packet for transmission (IFFT block, as shown on Fig. 9 and disclosed on 6:58-63, wherein IFFT block inherently comprises a processor, because a processor is essential for performing IFFT operation);
transmit processor/means for cyclically advancing the OFDM packet to generate one or more shifted versions of the OFDM packet for transmission (blocks of Fig. 9 to perform square root and cyclic delay operation in corresponding paths 1-M, inherently done by a processor, because a processor is essential for these operations);
radio transmitter/means for converting the OFDM packet and the one or more shifted versions of

the OFDM packet to corresponding radio signals (radio transmitter is inherent in the transmission system of Fig. 9, because it is essential for conversion of OFDM symbols into radio signals); and
a plurality of radio antennas/means connected to the radio transmitter for transmitting the radio signals to the OFDM receiver (multiple antennas Ant1 – AntM, shown on Fig. 9 and inherently connected with a transmitter).

Larsson in view of Admitted Prior Art does not teach using separate transmit and radio processors for each path of Larsson system.

Official notice is taken that using separate processors for separate operations is well known and expected in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using separate processors for separate operations to the system of Larsson in view of Admitted Prior Art to improve the system speed of processing OFDM symbols for transmission.

6. Regarding claims 26, 27, 39 and 45, Larsson teaches performing cyclical shift, as shown on Fig. 8 and disclosed on 6:39-58, wherein the duration of cyclic shift operation is equal to one sample, what is smaller than guard interval/cyclic prefix CP, which comprises three samples, as shown on Fig. 8.

7. Regarding claims 28 and 46, Admitted Prior Art teaches legacy receiver to produce a plurality of impulse responses corresponding to OFDM symbols, as shown on Fig. 4B and disclosed on pages 5 and 6.

8. Regarding claim 29, Larsson teaches transmitting one or more shifted versions of the OFDM packet/symbol from multiple-antenna transmitter device, as shown on Fig. 9.

9. Regarding claim 30 (as best understood), Admitted Prior Art teaches delaying OFDM symbols as a result of multi-path effect and producing corresponding plurality of impulse responses corresponding to OFDM symbols, wherein shifted and non shifted symbols can arrive in any sequence, as shown on Fig. 4B and disclosed on pages 5 and 6.

10. Regarding claim 33, Larsson teaches transmitting one or more shifted versions of the OFDM packet/symbol from multiple-antenna transmitter device, as shown on Fig. 9, wherein the shift operation is performed on all, except first, paths.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use shifting of OFDM symbols on all paths of the system of Larsson in view of Admitted Prior Art as a design choice, the system will work without use of un shifted OFDM symbol and with any number of paths in the system.

11. Regarding claim 34, Larsson teaches performing cyclical shift, as shown on Fig. 8 and disclosed on 6:39-58, wherein the cyclic shift operation is equal to one sample, what is smaller than guard interval/cyclic prefix CP, comprising three samples on Fig. 8.

12. Regarding claim 36, Larsson teaches performing interleaving the data received for transmission on a plurality of sub-carriers, as disclosed on 8:10-16.

13. Regarding claim 37, Larsson teaches performing IFFT for generating OFDM symbols, as shown on Fig. 9 and disclosed on 6:58-64.

Larsson in view of Admitted Prior Art does not teach each transmit processor/operation path to include IFFT blocks.

Official notice is taken that performing operations in parallel to increase the system speed is well known and expected in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using separate IFFT blocks for each path of the system of Larsson in view of Admitted Prior Art to improve the system speed of processing OFDM symbols for transmission.

14. Regarding claim 38 (as best understood), Admitted Prior Art teaches transmit processor 102 comprising baseband processing, as shown on Fig. 1 and disclosed on page 2.

15. Regarding claim 41, Admitted Prior Art teaches transmitter 102 on Fig. 1 as 802.11 compliant device on page 2.

16. Claims 25 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson in view of Admitted Prior Art.

Larsson in view of Admitted Prior Art substantially teaches the limitations of the parent claims (see claims 24, 32 and 33 rejections above).

Larsson in view of Admitted Prior Art does not teach using duration of cyclically advancing step less than 800 nanoseconds.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using duration of cyclically advancing step less than 800 nanoseconds to the system of Larsson in view of Admitted Prior Art as a design choice as the duration of less than 600 or 700 nanoseconds will work in the system as well.

17. Claims 40, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson in view of Admitted Prior Art.

Larsson in view of Admitted Prior Art substantially teaches the limitations of the parent claims (see claims 32 rejections above).

Larsson in view of Admitted Prior Art does not teach using ASIC, FPGA or firmware stored in a memory to implement the disclosed method.

Official notice is taken that using ASIC, FPGA or firmware stored in a memory for a method or system implementation are well known and expected in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using ASIC, FPGA or firmware stored in a memory to the system of Larsson in view of Admitted Prior Art to implement the described method and system using well known approaches.

Response to Arguments

18. Applicant's arguments filed 1/27/09 have been fully considered but they are not persuasive.

On page 8 and 9 of the Response, Applicant argues that claims 24, 32 and 44 are allowable because Larsson does not teach FFT window alignment to be substantially coincident with the symbol boundary of OFDM packet.

Examiner respectfully disagrees.

Larson clearly teaches OFDM symbols $n-1$, n and $n+1$ substantially aligned with FFT window symbols $n-1$, n and $n+1$ boundaries, as shown on Fig. 9.

Art Unit: 2416

In addition, claims 24, 32 and 44 limitations “cause an FFT window alignment to be substantially coincident with the symbol boundary of OFDM packet” are not given patentable value, because they are not positive limitations, as they are directed to a desired result/goal without any positive steps/ blocks on how to achieve the result.

Also, the cited limitations of claims 24, 32 and 46 were identified above as new matter.

On pages 8 and 9 of the Response, Applicant argues that Larsson does not teach “cyclically advancing” limitations of the independent claims, but teaches only “cyclically delaying”, making the claims patentable over Larsson.

Examiner respectfully disagrees.

Larsson teaches cyclical operation of shifting of a portion of the OFDM signal from the symbol end to the symbol beginning, which results in advancement of the shifted portion and in delay of the other portion of the symbol, pushed back by the advanced portion, as disclosed on 5:20-40. Therefore, Applicant’s emphasis on the advancing data in the cyclical shift is not a patentable feature over similar cyclical shift operation of Larsson, wherein some portion of the symbol is advanced and other portion of the symbol is delayed.

Appendix to the Specification has been considered.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dmitry Levitan whose telephone number is (571) 272-3093. The examiner can normally be reached on 8:30 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dmitry Levitan/
Primary Examiner, Art Unit 2416

<i>Index of Claims</i> 	Application/Control No. 11121661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.
	Examiner Dmitry Levitan	Art Unit 2416

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.D.
 ☐ R.1.47

CLAIM		DATE								
Final	Original	05/16/2008	10/23/2008	02/27/2009						
	1	✓	✓	-						
	2	✓	✓	-						
	3	✓	✓	-						
	4	✓	✓	-						
	5	✓	✓	-						
	6	✓	✓	-						
	7	✓	✓	-						
	8	✓	✓	-						
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	16	✓	✓	-						
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	33			✓						
	34			✓						
	35			✓						
	36			✓						

<i>Index of Claims</i> 	Application/Control No. 11121661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.
	Examiner Dmitry Levitan	Art Unit 2416

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant										☐ CPA										☐ T.D.										☐ R.1.47									
CLAIM		DATE																																					
Final	Original	05/16/2008	10/23/2008	02/27/2009																																			
	37			✓																																			
	38			✓																																			
	39			✓																																			
	40			✓																																			
	41			✓																																			
	42			✓																																			
	43			✓																																			
	44			✓																																			
	45			✓																																			
	46			✓																																			

<i>Search Notes</i> 	Application/Control No. 11121661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.
	Examiner Dmitry Levitan	Art Unit 2416

SEARCHED			
Class	Subclass	Date	Examiner
370	203-210, 310, 342-345	1/27/09	DL
455	562, 101	1/27/09	DL

SEARCH NOTES		
Search Notes	Date	Examiner
IEEE, EAST	1/27/09	DL

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

--	--

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

Practitioners associated with the Customer Number:
OR

20306



Practitioner(s) named below (If more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:



The address associated with Customer Number:

20306

OR

☐ Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

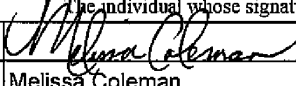
Assignee Name and Address:

Xocyst Transfer AG L.L.C.
2711 Centerville Road, Suite 400
Wilmington, DE 19808

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	12.9.08
Name	Melissa Coleman	Telephone	
Title	Authorized Person for Xocyst Transfer AG L.L.C.		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

American LegalNet, Inc.
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APPENDIX
Issued Patents

Line No.	Patent Number	Title	Issue Date	Recordation Information
1.	5,828,692	BASEBAND DEMODULATOR FOR POLAR OR RECTANGULAR MODULATED SIGNAL IN A CORDLESS SPREAD SPECTRUM TELEPHONE	10/27/1998	Reel/Frame: 007898/0071 Assignors: WALLEY, JOHN S. Assignee: ROCKWELL INTERNATIONAL CORPORATION Reel/Frame: 018847/0871 Assignors: ROCKWELL INTERNATIONAL CORPORATION Assignee: ROCKWELL SCIENCE CENTER, INC. Reel/Frame: 010415/0761 Assignors: ROCKWELL SCIENCE CENTER, LLC Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
2.	6,353,413	MULTI-FUNCTION UNIVERSAL CONTROLLER AND LOCATOR SYSTEMS	03/05/2002	Reel/Frame: 020031/0952 Assignors: WHITE, STANLEY A., ET AL. Assignee: ROCKWELL SCIENCE CENTER, INC. Reel/Frame: 020035/0018 Assignors: ROCKWELL SCIENCE CENTER, LLC Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
3.	7,174,138	POWER-BASED HARDWARE DIVERSITY	02/06/2007	Reel/Frame: 016013/0386 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
4.	7,447,261	ADAPTIVE FREQUENCY EQUALIZER	11/04/2008	Reel/Frame: 015990/0117 Assignors: SHEARER, DANIEL D., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
5.	7,398,408	SYSTEMS AND METHODS FOR WAKING UP WIRELESS LAN DEVICES	07/08/2008	Reel/Frame: 016028/0948 Assignors: PALJUG, MICHAEL, ET AL. Assignee: CONEXANT SYSTEMS, INC.

				Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
6.	7,272,109	MODIFIED OFDM SUBCARRIER PROFILE	09/18/2007	Reel/Frame: 016208/0511 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.

APPENDIX
Pending Applications

Line No.	Application Number	Title	Filing Date	Recordation Information
7.	10/977,469	INDEPENDENT DIRECT LINK PROTOCOL	11/01/2004	Reel/Frame: 016329/0091 Assignors: WENTINK, MENZO, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
8.	10/977,470	AUTOMATIC PEER DISCOVERY	11/01/2004	Reel/Frame: 016329/0098 Assignors: WENTINK, MENZO, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
9.	10/977,490	LOCATION AWARENESS IN WIRELESS NETWORKS	11/01/2004	Reel/Frame: 016276/0300 Assignors: GODFREY, TIMOTHY Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
10.	11/035,065	POWER MANAGEMENT FOR WIRELESS DIRECT LINK	01/14/2005	Reel/Frame: 016176/0192 Assignors: WENTINK, MENZO, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
11.	11/839,152	METHOD FOR MITIGATING ADVERSE PROCESSOR LOADING IN A PERSONAL COMPUTER IMPLEMENTATION OF A WIRELESS LOCAL AREA NETWORK ADAPTER	08/15/2007	Reel/Frame: 021340/0829 Assignors: SCHULTZ, RICHARD DOUGLAS, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
12.	10/830,570	SIGNALING EXTENDED FUNCTIONALITY AND MANAGEMENT INFORMATION IN A NETWORK	04/23/2004	Reel/Frame: 014759/0610 Assignors: FISCHER, MICHAEL ANDREW, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
13.	10/830,575	MANAGING COEXISTENCE OF SEPARATE PROTOCOLS SHARING THE SAME COMMUNICATIONS CHANNEL	04/23/2004	Reel/Frame: 014874/0546 Assignors: FISCHER, MICHAEL ANDREW, ET AL. Assignee: CONEXANT SYSTEMS, INC.

				Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
14.	10/861,064	MANAGING AN ACCESS POINT IN THE PRESENCE OF SEPARATE PROTOCOLS THAT SHARE THE SAME COMMUNICATIONS CHANNEL	06/04/2004	Reel/Frame: 014874/0569 Assignors: GODFREY, TIMOTHY GORDON, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
15.	10/861,065	INTELLIGENT DOWNSTREAM TRAFFIC DELIVERY TO MULTI-PROTOCOL STATIONS	06/04/2004	Reel/Frame: 014874/0569 Assignors: GODFREY, TIMOTHY GORDON, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
16.	10/861,066	METHOD AND APPARATUS FOR VEHICLE TRACKING AND CONTROL	06/04/2004	Reel/Frame: 015434/0482 Assignors: GODFREY, TIMOTHY GORDON, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
17.	12/168,706	SYSTEMS AND METHODS FOR WAKE-ON-LAN FOR WIRELESS LAN DEVICES	07/07/2008	Reel/Frame: 021443/0717 Assignors: PALJUG, MICHAEL Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
18.	11/033,524	METHOD AND SYSTEM FOR HIGH DATA RATE MULTI-CHANNEL WLAN ARCHITECTURE	01/12/2005	Reel/Frame: 016506/0056 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
19.	11/083,080	MULTICHANNEL MAC DATA STREAM FOR WIRELESS COMMUNICATION	03/18/2005	Reel/Frame: 018862/0395 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
20.	11/105,909	DUAL MODE COMMUNICATION SYSTEMS AND METHODS	04/13/2005	Reel/Frame: 016654/0241 Assignors: SEALS, MICHAEL J., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607

				Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
21.	11/106,915	PACKET GENERATION SYSTEMS AND METHODS	04/15/2005	Reel/Frame: 016200/0420 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
22.	11/121,661	CYCLIC DIVERSITY SYSTEMS AND METHODS	05/04/2005	Reel/Frame: 016541/0490 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
23.	11/159,812	LEGACY COMPATIBLE SPATIAL MULTIPLEXING SYSTEMS AND METHODS	06/22/2005	Reel/Frame: 016639/0012 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
24.	11/186,260	PACKET PROCESSING SYSTEMS AND METHODS	07/21/2005	Reel/Frame: 016678/0134 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
25.	11/185,665	PACKET GENERATION SYSTEMS AND METHODS	07/20/2005	Reel/Frame: 016643/0802 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
26.	11/203,617	SYSTEMS AND METHODS FOR DECREASING LATENCY IN A DIGITAL TRANSMISSION SYSTEM	08/12/2005	Reel/Frame: 018804/0373 Assignors: HEDBERG, DAVID, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
27.	11/433,599	CODING SYSTEMS AND METHODS	05/12/2006	Reel/Frame: 017865/0305 Assignors: HEDBERG, DAVID Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
28.	11/314,143	SYSTEMS AND METHODS FOR THE CONNECTION AND REMOTE CONFIGURATION	12/21/2005	Reel/Frame: 017404/0053 Assignors: WENTINK, MENZO, ET AL.

		OF WIRELESS CLIENTS		Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
29.	11/314,149	SYSTEMS AND METHODS FOR DEVICE DISCOVERY	12/21/2005	Reel/Frame: 017416/0241 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
30.	11/410,707	BEAMFORMING SYSTEMS AND METHODS	04/25/2006	Reel/Frame: 018043/0355 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
31.	11/411,619	SYSTEMS AND METHODS FOR TRANSMITTER DIVERSITY EXPANSION	04/26/2006	Reel/Frame: 018043/0463 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
32.	11/448,603	METHOD OF CODING DATA	06/06/2006	Reel/Frame: 018176/0506 Assignors: MITTELSTEADT, CIMARRON, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
33.	11/549,438	MAC PROTECTION	10/13/2006	Reel/Frame: 018389/0627 Assignors: WENTINK, MENZO, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
34.	11/556,916	SYSTEMS AND METHODS FOR FACILITATING COMMUNICATION BETWEEN COMMUNICATION DEVICES	11/06/2006	REEL/FRAME: 018789/0982 ASSIGNORS: WENTINK, MENZO, ET AL. ASSIGNEE: CONEXANT SYSTEMS, INC. REEL/FRAME: 022134/0518 ASSIGNORS: CONEXANT SYSTEMS, INC. ASSIGNEE: XOCYST TRANSFER AG L.L.C.
35.	11/557,516	COLLISION AVOIDANCE SYSTEMS AND METHODS	11/08/2006	Reel/Frame: 018493/0986 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607

				Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
36.	11/651,879	SYMMETRIC TRANSMIT OPPORTUNITY (TXOP) TRUNCATION	01/10/2007	Reel/Frame: 018782/0584 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
37.	11/613,020	MORE POWER SAVE MULTI-POLL INDICATION	12/19/2006	Reel/Frame: 018995/0126 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
38.	11/627,181	TRANSMIT ANNOUNCEMENT INDICATION	01/25/2007	Reel/Frame: 020630/0654 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
39.	11/638,157	DUAL CTS PROTECTION SYSTEMS AND METHODS	12/13/2006	Reel/Frame: 018680/0742 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
40.	11/680,612	METHODS AND SYSTEMS FOR LDPC CODING	02/28/2007	Reel/Frame: 019555/0669 Assignors: KOSE, CENK Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
41.	11/683,526	TRANSMISSION USING A PLURALITY OF PROTOCOLS	03/08/2007	Reel/Frame: 018980/0592 Assignors: CARTER, TRENT, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
42.	11/686,147	POWER SAVE IMPROVEMENT	03/14/2007	Reel/Frame: 019011/0698 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
43.	11/688,274	SLEEP MODE SYSTEMS AND METHODS	03/20/2007	Reel/Frame: 019033/0419 Assignors: CARTER, TRENT R.

				Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
44.	11/750,684	ACCESS POINT POLLING SYSTEMS AND METHODS	05/18/2007	Reel/Frame: 019374/0776 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
45.	11/750,693	COMMUNICATION ROAMING SYSTEMS AND METHODS	05/18/2007	Reel/Frame: 019315/0231 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
46.	10/460,684	METHOD FOR MINIMIZING RECEIVE PACKAGE PROCESSING FOR A PERSONAL COMPUTER IMPLEMENTATION OF A WIRELESS LOCAL AREA NETWORK ADAPTER	06/12/2003	REEL/FRAME: 018000/0476 ASSIGNORS: SCHULTZ, RICHARD DOUGLAS ET AL. ASSIGNEE: CONEXANT SYSTEMS, INC. REEL/FRAME: 022043/0607 ASSIGNORS: CONEXANT SYSTEMS, INC. ASSIGNEE: XOCYST TRANSFER AG L.L.C.
47.	10/625,799	METHOD FOR MITIGATING ADVERSE PROCESSOR LOADING IN A PERSONAL COMPUTER IMPLEMENTATION OF A WIRELESS LOCAL AREA NETWORK ADAPTER	07/23/2003	REEL/FRAME: 018000/ 0130 ASSIGNORS: SCHULTZ, RICHARD, ET AL. ASSIGNEE: CONEXANT SYSTEMS, INC. REEL/FRAME: 022043/0607 ASSIGNORS: CONEXANT SYSTEMS, INC. ASSIGNEE: XOCYST TRANSFER AG L.L.C.
48.	12/246,219	ADAPTIVE FREQUENCY EQUALIZER	10/06/2008	REEL/FRAME: 015990/0117 ASSIGNORS: SHEARER, DANIEL D., ET AL. ASSIGNEE: CONEXANT SYSTEMS, INC. REEL/FRAME: 022043/0607 ASSIGNORS: CONEXANT SYSTEMS, INC. ASSIGNEE: XOCYST TRANSFER AG L.L.C.
49.	11/239,657	SYSTEM AND METHOD FOR NON-INTERFERING SIGNALING AND RECEPTION OF OVERLAPPING SINGLE CARRIER TRANSMISSIONS OVER DELAY SPREAD CHANNELS	09/28/2005	REEL/FRAME: 018307/0337 ASSIGNORS: EIDSON, DONALD BRIAN ASSIGNEE: CONEXANT SYSTEMS, INC. REEL/FRAME: 022043/0607 ASSIGNORS: CONEXANT SYSTEMS, INC. ASSIGNEE: XOCYST TRANSFER AG L.L.C.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: XOCYST TRANSFER AG L.L.C.

Application No./Patent No.: 11/121,661 Filed/Issue Date: 05/04/2005

Entitled: CYCLIC DIVERSITY SYSTEMS AND METHODS

XOCYST TRANSFER AG L.L.C., a corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest
(The extent (by percentage) of its ownership interest is _____%)

in the patent application/patent identified above by virtue of either:

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

OR

B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: See attached Appendix, line 22 To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.
2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.
3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☒ Additional documents in the chain of title are listed on a supplemental sheet.

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Robert J. Irvine III/

Signature

Robert J. Irvine III

Printed or Typed Name

Attorney of Record

Title

February 26, 2009

Date

312-913-0001

Telephone Number

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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Electronic Acknowledgement Receipt	
EFS ID:	4867951
Application Number:	11121661
International Application Number:	
Confirmation Number:	3553
Title of Invention:	Cyclic diversity systems and methods
First Named Inventor/Applicant Name:	Mark A. Webster
Customer Number:	20306
Filer:	Robert Johnson Irvine
Filer Authorized By:	
Attorney Docket Number:	050337-1020
Receipt Date:	03-MAR-2009
Filing Date:	04-MAY-2005
Time Stamp:	19:39:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	POA.pdf	43382 3df8a49bb4ba5c215c99eed21e056b57eedb4020	no	1

Warnings:

Information:

2	Miscellaneous Incoming Letter	Appendix_2.pdf	84656	no	8
			66c9c76f39b0ee727b1ff7744f7497fdf8b682c22		
Warnings:					
Information:					
3	Assignee showing of ownership per 37 CFR 3.73(b).	08-1424-US-Statement.pdf	74524	no	1
			de8cf398f74b19cca8bfb720157754cdd3137c6		
Warnings:					
Information:					
Total Files Size (in bytes):			202562		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (12-08)

Approved for use through 01/31/2009. OMB 0651-0031

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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL (Submitted Only via EFS-Web)

Application Number	11121661	Filing Date	2005-05-04	Docket Number (if applicable)	08-1424-US	Art Unit	2416
First Named Inventor	Mark A. Webster			Examiner Name	Levitan, Dmitry		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☒ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to
Deposit Account No 132490

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

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Signature of Registered U.S. Patent Practitioner			
Signature	/Robert J. Irvine III/	Date (YYYY-MM-DD)	2009-01-27
Name	Robert J. Irvine III	Registration Number	41865

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Attorney Docket No. 08-1424-US)

In the Application of:	)	
	)	
Mark A. Webster et al.	)	
	)	Examiner: Dmitry Levitan
Serial No.: 11/121,661	)	
	)	Group Art Unit: 2416
Filing Date: May 4, 2005	)	
	)	Confirmation No.: 3553
For: Cyclic Diversity Systems And	)	
Methods	)	

Mailstop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AND REQUEST FOR CONTINUED EXAMINATION

Dear Sir:

In response to the Final Office Action mailed on October 27, 2008, Applicants respectfully submit the following Amendments to Claims with Remarks, in conjunction with a Request for Continued Examination.

Amendments to Claims begin on page 2; **Remarks** begin on page 7 of this paper.

AMENDMENTS TO CLAIMS

1-23. (Canceled)

24. (New) A method for transmitting orthogonal frequency division multiplexing (OFDM) signals to a legacy OFDM receiver that aligns a Fast Fourier Transform (FFT) window based on detecting shifted versions of the OFDM signals, comprising:

generating an OFDM packet for transmission;

cyclically advancing the OFDM packet to generate one or more shifted versions of the OFDM packet for transmission; and

transmitting the OFDM packet and the one or more shifted versions of the OFDM packet to the legacy OFDM receiver, wherein the cyclical advancements of the one or more shifted versions of the OFDM packet cause an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet.

25. (New) The method of claim 24, further comprising cyclically advancing the OFDM packet for a duration of less than approximately 800 nanoseconds.

26. (New) The method of claim 24, further comprising cyclically advancing the OFDM packet for a duration of less than one half of a guard interval.

27. (New) The method of claim 26, wherein, the duration of the cyclical advancement corresponds to a number of sample shifts in a cycle.

28. (New) The method of claim 24, wherein the cyclical advancements of the one or more shifted versions of the OFDM packet cause the legacy receiver to produce a plurality of impulsive responses in an acquisition process, and wherein each of the OFDM packet and one

or more shifted version of the OFDM packet corresponds to one of the plurality of impulsive responses.

29. (New) The method of claim 24, further comprising transmitting the OFDM packet and the one or more shifted versions of the OFDM packet from a multiple-antenna transmitter device.

30. (New) The method of claim 29, wherein the impulse responses corresponding to the one or more shifted version of the OFDM packet occur earlier in time than the impulse responses corresponding to the OFDM packet.

31. (New) The method of claim 24, wherein the legacy OFDM receiver is a single-input, single-output (SISO) receiver device.

32. (New) A signal transmitting system for transmitting orthogonal frequency division multiplexing (OFDM) signals to a legacy OFDM receiver that aligns a Fast Fourier Transform (FFT) window based on detecting shifted versions of the OFDM signals, comprising:

- a first transmit processor for generating a OFDM packet for transmission;

- a plurality of transmit processor for cyclically advancing the OFDM packet to generate one or more shifted versions of the OFDM packet for transmission;

- a plurality of radio transmitters for converting the OFDM packet and the one or more shifted versions of the OFDM packet to corresponding radio signals; and

- a plurality of radio antennas connected to the plurality of radio transmitters for transmitting the radio signals to the legacy OFDM receiver, wherein the cyclical advancements of the one or more shifted versions of the OFDM packet cause an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet.

33. (New) The system of claim 32, wherein each of the plurality of transmit processor includes a cyclic extension module for performing the cyclical advancements.

34. (New) The system of claim 33, wherein each of the cyclic extension modules is configured to cyclically advance the OFDM packet for a duration of less than one half of guard interval.

35. (New) The system of claim 33, wherein each of the cyclic extension modules is configure to cyclically advance the OFDM packet for a duration of less than approximately 800 nanoseconds.

36. (New) The system of claim 32, wherein the first transmit processor is configured to receive incoming data and interleave the received data into a plurality of sub-carrier channels.

37. (New) The system of claim 32, wherein each of the plurality of transmit processors further includes an Inverse Fast Fourier (IFFT) module for generating OFDM symbols from incoming data.

38. (New) The system of claim 9, wherein the plurality of transmit processors perform the cyclical advancements on baseband signals.

39. (New) The system of claim 32, wherein, a duration of the cyclical advancement corresponds to a number of sample shifts in a cycle.

40. (New) The system of claim 32, wherein the first transmit processor and the plurality of transmit processors include application specific integrated circuits (ASICs).

41. (New) The system of claim 32, wherein the transmitter is an 802.11 compliant device.

42. (New) The system of claim 32, wherein the first transmit processor and the plurality of transmit processors include field programmable gate arrays (FPGAs).

43. (New) The system of claim 32, wherein the first transmit processor and the plurality of transmit processor include firmware stored in a memory device and executed by a suitable instruction execution system.

44. (New) A signal transmitting system for transmitting orthogonal frequency division multiplexing (OFDM) signals to a legacy OFDM receiver that aligns a Fast Fourier Transform (FFT) window based on detecting shifted versions of the OFDM signals, comprising:

means for generating a OFDM packet for transmission;

means for cyclically advancing the OFDM packet to generate one or more shifted versions of the OFDM packet for transmission;

means for converting the OFDM packet and the one or more shifted versions of the OFDM packet to corresponding radio signals; and

means for transmitting the radio signals to the legacy OFDM receiver, wherein the cyclical advancements of the one or more shifted versions of the OFDM packet cause an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet.

45. (New) The system of claim 44, wherein the cyclic advance has a duration less than one of half of a guard interval of the OFDM packet.

46. (New) The system of claim 44, wherein the cyclical advancements of the one or more shifted versions of the OFDM packet cause the legacy receiver to produce a plurality of impulsive responses in an acquisition process, and wherein each of the OFDM packet and one

or more shifted version of the OFDM packet corresponds to one of the plurality of impulsive responses.

REMARKS

1. Summary of the Office Action

In the Final Office Action mailed on October 27, 2008, the Examiner rejected claims 1, 9, 21 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, rejected 1, 3-7, 9-11, 13-16, and 19-23 under 35 U.S.C. 102(e) as being anticipated by Larsson (U.S. Patent No. 6,842,487), rejected claims 2 and 12 under 35 U.S.C. 103(a) as being obvious over Larsson, and rejected claims 8 and 17-18 as being obvious over Larsson in view of Admitted Prior Art.

2. Status of Claims

Applicants have canceled claims 1-23 and added new claims 24-46. Currently pending claims are claims 24-46 of which claims 24, 32, and 44 are in independent form and the remaining claims are in dependent form. No new matter is added.

3. Response to Rejections under 35 U.S.C. 112, Second Paragraph

As noted above, in the Final Office Action mailed on October 27, 2008, the Examiner rejected independent claims 1, 9, and 21 under U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants submit that the rejection is rendered moot by the present amendments, which have replaced the independent claims that particularly point out and distinctly claim the subject matter.

In rejecting claims 1, 9, and 21, the Examiner asserted that "advancing a portion of the signal is always relative to the other copy/duplicate of the signal, which is delayed, as advancing signal in time is physically impossible." See the Final Office Action, page 2, lines 14-16. The pending claims recite "cyclically advancing the OFDM packet to generate one or more shifted versions of the OFDM packet...wherein the cyclical advancements of the one or more shifted versions of the OFDM packet cause an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet." As further described in specification,

paragraph 0040 and Figure 8, the “cyclical advancement” set forth in the claims is accomplished by shifting the samples of the OFDM symbol in a direction opposite to that described by the prior art. Such “cyclical advancement” is imparted to the “one or more shifted versions of the OFDM packet” relative to the original OFDM packet. As further recited in claim 24, for a legacy receiver that aligns the FFT window based on detecting shifted versions of the OFDM signals, such cyclical advancement cause “an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet.” This is clearly described in specification, paragraph 0041 that recites “unlike cyclic delay diversity, cyclic advance diversity does not result in net shifting of the FFT” since the legacy receiver places the FFT after the detection of the last impulse response that is aligned with the symbol boundary of the original OFDM packet. For the reasons set forth above, Applicants respectfully submit that the claims comply with § 112.

4. Response to Rejections under 35 U.S.C. 102(e)

In the Final Office Action, the Examiner rejected claim 1 under 35 U.S.C. 102(e) as being anticipated by Larsson. Applicants have submitted new claim 24 and respectfully submit that Larsson fails to teach or disclose the subject matter as now set forth in claim 24.

Specifically, claim 24 recites “A method for transmitting orthogonal frequency division multiplexing (OFDM) signals to a legacy OFDM receiver that aligns a Fast Fourier Transform (FFT) window based on detecting shifted versions of the OFDM signals, comprising...cyclically advancing the OFDM packet...and transmitting the OFDM packet and the one or more shifted versions of the OFDM packet to the legacy OFDM receiver, wherein the cyclical advancements of the one or more shifted versions of the OFDM packet cause an FFT window alignment to be substantially coincident with the symbol boundary of the OFDM packet.” The Larsson reference, however, fails to suggest or disclose every element. First, Larsson merely describes a receiver having a fast Fourier transform window that is a set period of time. See Larsson, column 3, lines 18-23 and Figure 4. The FFT window as shown in Larsson, Figure 4, is not adjusted as the shifted versions of the OFDM packet are received. Larsson clearly fails to teach or suggest

that the OFDM signals are transmitted to “a legacy OFDM receiver that aligns a Fast Fourier Transform (FFT) window based on detecting shifted versions of the OFDM signals” as set forth in claim 24. Second, Larsson describes applying a “cyclic delay” to an OFDM symbol by “shifting samples from the end of the OFDM symbol into the beginning of the OFDM symbol and adding a cyclic prefix by copying the last n samples of the OFDM symbol.” See Larsson, column 6, lines 45-49 and Figure 8. Larsson, however, does not appear to suggest the “cyclical advancements” be applied to the OFDM packet as set forth in claim 24. In fact, as described in the specification, the “cyclic delay” described by Larsson would cause the legacy receiver to shift the FFT window into the subsequent symbol and thereby cause intersymbol interference since the intentional cyclic delay is “indistinguishable from the sample shifting that occurs in linear delay diversity” from the receiver standpoint. On the contrary, during the acquisition process, the cyclical advancement as set forth in claim 24 would cause the impulse responses corresponding to the shifted versions of the OFDM packet to occur before the impulse response of the unshifted OFDM packet, thereby preventing the erroneous alignment of the FFT window. For the reasons set forth above, Applicants submit that claim 24 is not anticipated by Larsson.

With respect to claims 32 and 44, Applicants point out that they include similar limitations of claim 24 and therefore are not anticipated by Larsson for at least the same reasons set forth above. Therefore, Applicants respectfully submit that they in condition for allowance.

With respect to the remaining claims, Applicants point out that they depend from independent claims 24, 32, and 44 and therefore are not anticipated by Larsson for at least the same reasons set forth above.

5. Response to Rejections under 35 U.S.C. 103 (a)

With respect to the obviousness rejections, Applicants submit that the deficiencies of Larsson remain even in view of the secondary references, and therefore are patentably distinguished from Larsson for at least the same reasons set forth above.

6. Conclusion

In view of the above, Applicant submits that the application is in condition for allowance and respectfully requests the Examiner pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of this application, the Examiner is invited to call the undersigned attorney at 312-913-3305.

Respectfully submitted,

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP

Date: January 27, 2009

By: /Robert J. Irvine III/
Robert J. Irvine III
Registration No.

Electronic Patent Application Fee Transmittal				
Application Number:		11121661		
Filing Date:		04-May-2005		
Title of Invention:		Cyclic diversity systems and methods		
First Named Inventor/Applicant Name:		Mark A. Webster		
Filer:		Robert Johnson Irvine		
Attorney Docket Number:		050337-1020		
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Request for continued examination	1801	1	810	810
Total in USD (\$)				810

Electronic Acknowledgement Receipt	
EFS ID:	4676448
Application Number:	11121661
International Application Number:	
Confirmation Number:	3553
Title of Invention:	Cyclic diversity systems and methods
First Named Inventor/Applicant Name:	Mark A. Webster
Customer Number:	24504
Filer:	Robert Johnson Irvine
Filer Authorized By:	
Attorney Docket Number:	050337-1020
Receipt Date:	27-JAN-2009
Filing Date:	04-MAY-2005
Time Stamp:	18:59:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$810
RAM confirmation Number	4280
Deposit Account	132490
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1	Power of Attorney	POA.pdf	43382 3df8a49bb4ba5c215c99eed21e056b57eedb4020	no	1
Warnings:					
Information:					
2	Miscellaneous Incoming Letter	Appendix_2.pdf	85626 fa5eaa27409146615f6a72fac3ff33ea2b2cb77c	no	9
Warnings:					
Information:					
3	Assignee showing of ownership per 37 CFR 3.73(b).	08-1424-US-Statement.pdf	74520 08898d86246721156d32a49a885af9c89bbf29df	no	1
Warnings:					
Information:					
4	Request for Continued Examination (RCE)	08-1424-US-RCE-REQ.pdf	792354 f6c18ed2236be746c464e52d89a0f0d20ee7df3c	no	3
Warnings:					
Information:					
5		08-1424-US-RCE.pdf	95855 35397ff3338457b4719c6afea199e8fc6cb24543	yes	10
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment Submitted/Entered with Filing of CPA/RCE		1	1	
	Claims		2	6	
	Applicant Arguments/Remarks Made in an Amendment		7	10	
Warnings:					
Information:					
6	Fee Worksheet (PTO-06)	fee-info.pdf	29910 8f3ecd56307ee68ebd81f37695dfb863dd373014	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			1121647		

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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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I hereby appoint:

☒ Practitioners associated with the Customer Number:
OR

20306

☐ Practitioner(s) named below (If more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

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20306

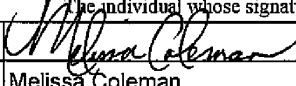
☐ Firm or Individual Name			
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Assignee Name and Address:
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2711 Centerville Road, Suite 400
Wilmington, DE 19808

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SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	12.9.08
Name	Melissa Coleman	Telephone	
Title	Authorized Person for Xocyst Transfer AG L.L.C.		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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APPENDIX
Issued Patents

Line No.	Patent Number	Title	Issue Date	Recordation Information
1.	5,828,692	BASEBAND DEMODULATOR FOR POLAR OR RECTANGULAR MODULATED SIGNAL IN A CORDLESS SPREAD SPECTRUM TELEPHONE	10/27/1998	Reel/Frame: 007898/0071 Assignors: WALLEY, JOHN S. Assignee: ROCKWELL INTERNATIONAL CORPORATION Reel/Frame: 018847/0871 Assignors: ROCKWELL INTERNATIONAL CORPORATION Assignee: ROCKWELL SCIENCE CENTER, INC. Reel/Frame: 010415/0761 Assignors: ROCKWELL SCIENCE CENTER, LLC Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
2.	6,353,413	MULTI-FUNCTION UNIVERSAL CONTROLLER AND LOCATOR SYSTEMS	03/05/2002	Reel/Frame: 020031/0952 Assignors: WHITE, STANLEY A., ET AL. Assignee: ROCKWELL SCIENCE CENTER, INC. Reel/Frame: 020035/0018 Assignors: ROCKWELL SCIENCE CENTER, LLC Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
3.	7,174,138	POWER-BASED HARDWARE DIVERSITY	02/06/2007	Reel/Frame: 016013/0386 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
4.	7,447,261	ADAPTIVE FREQUENCY EQUALIZER	11/04/2008	Reel/Frame: 015990/0117 Assignors: SHEARER, DANIEL D., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
5.	7,398,408	SYSTEMS AND METHODS FOR WAKING UP WIRELESS LAN DEVICES	07/08/2008	Reel/Frame: 016028/0948 Assignors: PALJUG, MICHAEL, ET AL. Assignee: CONEXANT SYSTEMS, INC.

				Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
6.	7,272,109	MODIFIED OFDM SUBCARRIER PROFILE	09/18/2007	Reel/Frame: 016208/0511 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.

APPENDIX
Pending Applications

Line No.	Application Number	Title	Filing Date	Recordation Information
7.	10/977,469	INDEPENDENT DIRECT LINK PROTOCOL	11/01/2004	Reel/Frame: 016329/0091 Assignors: WENTINK, MENZO, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
8.	10/977,470	AUTOMATIC PEER DISCOVERY	11/01/2004	Reel/Frame: 016329/0098 Assignors: WENTINK, MENZO, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
9.	10/977,490	LOCATION AWARENESS IN WIRELESS NETWORKS	11/01/2004	Reel/Frame: 016276/0300 Assignors: GODFREY, TIMOTHY Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
10.	11/035,065	POWER MANAGEMENT FOR WIRELESS DIRECT LINK	01/14/2005	Reel/Frame: 016176/0192 Assignors: WENTINK, MENZO, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
11.	11/839,152	METHOD FOR MITIGATING ADVERSE PROCESSOR LOADING IN A PERSONAL COMPUTER IMPLEMENTATION OF A WIRELESS LOCAL AREA NETWORK ADAPTER	08/15/2007	Reel/Frame: 021340/0829 Assignors: SCHULTZ, RICHARD DOUGLAS, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
12.	10/830,570	SIGNALING EXTENDED FUNCTIONALITY AND MANAGEMENT INFORMATION IN A NETWORK	04/23/2004	Reel/Frame: 014759/0610 Assignors: FISCHER, MICHAEL ANDREW, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
13.	10/830,575	MANAGING COEXISTENCE OF SEPARATE PROTOCOLS SHARING THE SAME COMMUNICATIONS CHANNEL	04/23/2004	Reel/Frame: 014874/0546 Assignors: FISCHER, MICHAEL ANDREW, ET AL. Assignee: CONEXANT SYSTEMS, INC.

				Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
14.	10/861,064	MANAGING AN ACCESS POINT IN THE PRESENCE OF SEPARATE PROTOCOLS THAT SHARE THE SAME COMMUNICATIONS CHANNEL	06/04/2004	Reel/Frame: 014874/0569 Assignors: GODFREY, TIMOTHY GORDON, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
15.	10/861,065	INTELLIGENT DOWNSTREAM TRAFFIC DELIVERY TO MULTI-PROTOCOL STATIONS	06/04/2004	Reel/Frame: 014874/0569 Assignors: GODFREY, TIMOTHY GORDON, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
16.	10/861,066	METHOD AND APPARATUS FOR VEHICLE TRACKING AND CONTROL	06/04/2004	Reel/Frame: 015434/0482 Assignors: GODFREY, TIMOTHY GORDON, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
17.	12/168,706	SYSTEMS AND METHODS FOR WAKE-ON-LAN FOR WIRELESS LAN DEVICES	07/07/2008	Reel/Frame: 021443/0717 Assignors: PALJUG, MICHAEL Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
18.	11/033,524	METHOD AND SYSTEM FOR HIGH DATA RATE MULTI-CHANNEL WLAN ARCHITECTURE	01/12/2005	Reel/Frame: 016506/0056 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
19.	11/083,080	MULTICHANNEL MAC DATA STREAM FOR WIRELESS COMMUNICATION	03/18/2005	Reel/Frame: 018862/0395 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
20.	11/105,909	DUAL MODE COMMUNICATION SYSTEMS AND METHODS	04/13/2005	Reel/Frame: 016654/0241 Assignors: SEALS, MICHAEL J., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607

				Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
21.	11/106,915	PACKET GENERATION SYSTEMS AND METHODS	04/15/2005	Reel/Frame: 016200/0420 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
22.	11/121,661	CYCLIC DIVERSITY SYSTEMS AND METHODS	05/04/2005	Reel/Frame: 016541/0490 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
23.	11/159,812	LEGACY COMPATIBLE SPATIAL MULTIPLEXING SYSTEMS AND METHODS	06/22/2005	Reel/Frame: 016639/0012 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
24.	11/186,260	PACKET PROCESSING SYSTEMS AND METHODS	07/21/2005	Reel/Frame: 016678/0134 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
25.	11/185,665	PACKET GENERATION SYSTEMS AND METHODS	07/20/2005	Reel/Frame: 016643/0802 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
26.	11/203,617	SYSTEMS AND METHODS FOR DECREASING LATENCY IN A DIGITAL TRANSMISSION SYSTEM	08/12/2005	Reel/Frame: 018804/0373 Assignors: HEDBERG, DAVID, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
27.	11/433,599	CODING SYSTEMS AND METHODS	05/12/2006	Reel/Frame: 017865/0305 Assignors: HEDBERG, DAVID Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
28.	11/314,143	SYSTEMS AND METHODS FOR THE CONNECTION AND REMOTE CONFIGURATION	12/21/2005	Reel/Frame: 017404/0053 Assignors: WENTINK, MENZO, ET AL.

		OF WIRELESS CLIENTS		Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
29.	11/314,149	SYSTEMS AND METHODS FOR DEVICE DISCOVERY	12/21/2005	Reel/Frame: 017416/0241 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
30.	11/410,707	BEAMFORMING SYSTEMS AND METHODS	04/25/2006	Reel/Frame: 018043/0355 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
31.	11/411,619	SYSTEMS AND METHODS FOR TRANSMITTER DIVERSITY EXPANSION	04/26/2006	Reel/Frame: 018043/0463 Assignors: WEBSTER, MARK A., ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
32.	11/448,603	METHOD OF CODING DATA	06/06/2006	Reel/Frame: 018176/0506 Assignors: MITTELSTEADT, CIMARRON, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
33.	11/549,438	MAC PROTECTION	10/13/2006	Reel/Frame: 018389/0627 Assignors: WENTINK, MENZO, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
34.	11/555,916	HIGH-POTENCY SWEETENER COMPOSITION WITH PROBIOTICS/PREBIOTICS AND COMPOSITIONS SWEETENED THEREWITH	11/02/2006	Reel/Frame: 018521/0176 Assignors: PRAKASH, INDRA, ET AL. Assignee: THE COCA-COLA COMPANY Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
35.	11/557,516	COLLISION AVOIDANCE SYSTEMS AND METHODS	11/08/2006	Reel/Frame: 018493/0986 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607

				Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
36.	11/651,879	SYMMETRIC TRANSMIT OPPORTUNITY (TXOP) TRUNCATION	01/10/2007	Reel/Frame: 018782/0584 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
37.	11/613,020	MORE POWER SAVE MULTI-POLL INDICATION	12/19/2006	Reel/Frame: 018995/0126 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
38.	11/627,181	TRANSMIT ANNOUNCEMENT INDICATION	01/25/2007	Reel/Frame: 020630/0654 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
39.	11/638,157	DUAL CTS PROTECTION SYSTEMS AND METHODS	12/13/2006	Reel/Frame: 018680/0742 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
40.	11/680,612	METHODS AND SYSTEMS FOR LDPC CODING	02/28/2007	Reel/Frame: 019555/0669 Assignors: KOSE, CENK Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
41.	11/683,526	TRANSMISSION USING A PLURALITY OF PROTOCOLS	03/08/2007	Reel/Frame: 018980/0592 Assignors: CARTER, TRENT, ET AL. Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
42.	11/686,147	POWER SAVE IMPROVEMENT	03/14/2007	Reel/Frame: 019011/0698 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
43.	11/688,274	SLEEP MODE SYSTEMS AND METHODS	03/20/2007	Reel/Frame: 019033/0419 Assignors: CARTER, TRENT R.

				Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
44.	11/750,684	ACCESS POINT POLLING SYSTEMS AND METHODS	05/18/2007	Reel/Frame: 019374/0776 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
45.	11/750,693	COMMUNICATION ROAMING SYSTEMS AND METHODS	05/18/2007	Reel/Frame: 019315/0231 Assignors: WENTINK, MENZO Assignee: CONEXANT SYSTEMS, INC. Reel/Frame: 022043/0607 Assignors: CONEXANT SYSTEMS, INC. Assignee: XOCYST TRANSFER AG L.L.C.
46.	10/460,684	METHOD FOR MINIMIZING RECEIVE PACKAGE PROCESSING FOR A PERSONAL COMPUTER IMPLEMENTATION OF A WIRELESS LOCAL AREA NETWORK ADAPTER	06/12/2003	REEL/FRAAME: 018000/0476 ASSIGNORS: SCHULTZ, RICHARD DOUGLAS ET AL. ASSIGNEE: CONEXANT SYSTEMS, INC. REEL/FRAAME: 022043/0607 ASSIGNORS: CONEXANT SYSTEMS, INC. ASSIGNEE: XOCYST TRANSFER AG L.L.C.
47.	10/625,799	METHOD FOR MITIGATING ADVERSE PROCESSOR LOADING IN A PERSONAL COMPUTER IMPLEMENTATION OF A WIRELESS LOCAL AREA NETWORK ADAPTER	07/23/2003	REEL/FRAAME: 018000/ 0130 ASSIGNORS: SCHULTZ, RICHARD, ET AL. ASSIGNEE: CONEXANT SYSTEMS, INC. REEL/FRAAME: 022043/0607 ASSIGNORS: CONEXANT SYSTEMS, INC. ASSIGNEE: XOCYST TRANSFER AG L.L.C.
48.	12/246,219	ADAPTIVE FREQUENCY EQUALIZER	10/06/2008	REEL/FRAAME: 015990/0117 ASSIGNORS: SHEARER, DANIEL D., ET AL. ASSIGNEE: CONEXANT SYSTEMS, INC. REEL/FRAAME: 022043/0607 ASSIGNORS: CONEXANT SYSTEMS, INC. ASSIGNEE: XOCYST TRANSFER AG L.L.C.
49.	11/239,657	SYSTEM AND METHOD FOR NON-INTERFERING SIGNALING AND RECEPTION OF OVERLAPPING SINGLE CARRIER TRANSMISSIONS OVER DELAY SPREAD CHANNELS	09/28/2005	REEL/FRAAME: 018307/0337 ASSIGNORS: EIDSON, DONALD BRIAN ASSIGNEE: CONEXANT SYSTEMS, INC. REEL/FRAAME: 022043/0607 ASSIGNORS: CONEXANT SYSTEMS, INC. ASSIGNEE: XOCYST TRANSFER AG L.L.C.
50.	11/556,916	SYSTEMS AND METHODS FOR FACILITATING COMMUNICATION BETWEEN COMMUNICATION DEVICES	11/06/2006	REEL/FRAAME: 018789/0982 ASSIGNORS: WENTINK, MENZO, ET AL. ASSIGNEE: CONEXANT SYSTEMS, INC. REEL/FRAAME: 022134/0518

			ASSIGNORS: CONEXANT SYSTEMS, INC. ASSIGNEE: XOCYST TRANSFER AG L.L.C.
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: XOCYST TRANSFER AG L.L.C.

Application No./Patent No.: 11/121,661 Filed/Issue Date: 05/04/2005

Entitled: CYCLIC DIVERSITY SYSTEMS AND METHODS

XOCYST TRANSFER AG L.L.C., a corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest
(The extent (by percentage) of its ownership interest is _____%)

in the patent application/patent identified above by virtue of either:

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

OR

B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: See attached Appendix, line 22 To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.
2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.
3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☒ Additional documents in the chain of title are listed on a supplemental sheet.

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Robert J. Irvine III/

January 23, 2009

Signature

Date

Robert J. Irvine III

312-913-0001

Printed or Typed Name

Telephone Number

Attorney of Record

Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 11/121,661		Filing Date 05/04/2005		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)			SMALL ENTITY ☐ OR		OTHER THAN SMALL ENTITY		
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(l))	minus 20 =	*	X \$ =		OR	X \$ =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =			X \$ =				
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.										
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	01/27/2009	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 23	Minus	** 23	= 0	X \$ =		OR	X \$2= 0	
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X \$ =		OR	X \$220= 0	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0	
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =		OR	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =		OR	X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE		
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

Legal Instrument Examiner:
/DEBORAH NASH/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/121,661	05/04/2005	Mark A. Webster	050337-1020	3553

24504	7590	10/27/2008
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP		
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ATLANTA, GA 30339-5994		

EXAMINER	
LEVITAN, DMITRY	

ART UNIT	PAPER NUMBER
2416	

MAIL DATE	DELIVERY MODE
10/27/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 11/121,661		Applicant(s) WEBSTER ET AL.	
	Examiner Dmitry Levitan		Art Unit 2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 27 September 2008.

2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-23 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Amendment, filed 9/27/08, has been entered. Claims 1-23 remain pending.

Claim Rejections - 35 USC § 112

1. Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 9 and 21 recite the limitations "cyclically advancing one or more section of the first OFDM packet, or a periodic equivalent of one or more sections of the first OFDM packet to produce a second OFDM packet" in corresponding lines. These limitations are unclear, because it is not understood what is a periodic equivalent of sections in OFDM packet, and how these limitations are associated with "cyclically advancing" operation.

Claim 1, 9 and 21 limitations, directed to "advancing one or more sections of the first OFDM packet" are unclear, because it is not understood what "advancing" means in the context of the claims.

Examiner believes that advancing a portion of the signal is always relative to the other copy/duplicate of the signal, which is delayed, as advancing signal in time is physically impossible.

Other claims are rejected as the claims depending on the claims rejected above.

Claim Rejections - 35 USC § 102

2. Claims 1, 3-7, 9-11, 13-16 and 19-23 are rejected (as best understood) under 35 U.S.C. 102(e) as being anticipated by Larsson (US 6,842,487).

3. Regarding claims 1, 9 and 21, Larsson teaches a method and a system, performing a cyclic diversity operation (as shown on Fig. 9 and disclosed on 6:58-7:25) comprising:

providing a OFDM packet corresponding to first transmit antenna (providing one of OFDM symbols: $n-1$, n or $n+1$ to first transmit antenna Ant1 TX, as shown on Fig. 9, and disclosed on 6:49-57)

performing a periodic cyclic advancing operation on one or more sections of the OFDM packet corresponding to a second transmit antenna (performing cyclic delay operation on the same OFDM symbol corresponding to a second transmit antenna Ant 2 TX, as shown on Fig. 8 and 9 by shifting the OFDM samples, as described on 6:40-57, therefore advancing the other portion of the OFDM signal, corresponding to Ant1 TX, as delaying one portion of the signal will advance the other portion of the same signal), wherein the duration of the periodic cyclic advance operation is less than a guard interval (performing 1 sample cyclic delay operation, which is less than the cyclic prefix, identified as guard interval on 1:30-32, as the length of the cyclic prefix (CP) is three samples, as clearly shown on Fig. 8).

In addition, regarding claims 9 and 21, Larsson teaches logic and means to perform the steps of the method, as disclosed above, in a system, shown on Fig. 9 and disclosed on 6:58-7:26.

4. Regarding claims 3- 6, 10, 11, 13 and 14, Larsson teaches using multiple transmit antennas with cyclic delay operations performed by corresponding Cyclic delay sections/modules on OFDM symbols, as shown on Fig. 9.

5. Regarding claims 7, 15 and 16, Larsson teaches receiving the OFDM packets/symbols from first and second transmit antennas, Ant 1 TX and Ant 2 TX, on receive antenna Ant 1 RX and performing FFT in the windows corresponding to the recovered OFDM symbols/packets, as clearly shown on Fig. 9.
6. Regarding claims 19 and 20, Larsson teaches a system including attenuators, IFFT and cyclic delay blocks, as shown on Fig. 9, which are inherently comprise hardware and digital circuitry, because hardware and digital circuitry are essential for the system operation.
7. Regarding claims 22 and 23, Larsson teaches a stream of OFDM symbols/packets, as shown on Fig. 1, 2 and 9.

Claim Rejections - 35 USC § 103

8. Claims 2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson. Larsson substantially teaches the limitations of the parent claims (see claims 1 and 9 rejections above).

Larsson does not teach using duration of cyclically advancing step less than 800 nanoseconds.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using duration of cyclically advancing step less than 800 nanoseconds to the system of Larsson as a design choice as the duration of less than 600 or 700 nanoseconds will work in the system as well.

9. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson in view of Admitted Prior Art (Current application, Fig. 1-5 and pages 1-7).

Art Unit: 2416

Larsson substantially teaches the limitations of the parent claims (see claims 1, 7, 9, 15 and 16 rejections above), including use of a single input receiver, as shown on Fig. 9 and disclosed on 7:14-25.

Larsson does not teach using single-input, single-output (SISO) receiver.

Admitted Prior Art teaches legacy SISO receivers to be considered/used with multiple antennas systems on Fig. 1 and pages 1 and 2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using single-input, single-output (SISO) receiver of Admitted Prior Art to the system of Larsson to improve the system compatibility with existing SISO receivers.

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson in view of Admitted Prior Art (Current application, Fig. 1-5 and pages 1-7).

Larsson substantially teaches the limitations of the parent claims (see claim 9 rejections above).

Larsson does not teach using 802.11 compliant device.

Admitted Prior Art teaches using 802.11 receiver device, as shown on Fig. 1 and pages 1 and 2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using 802.11 compliant, single-input, single-output (SISO) receiver of Admitted Prior Art to the system of Larsson to improve the system compatibility with existing receivers, utilizing 802.11 standard.

Response to Arguments

11. Applicant's arguments filed 9/27/08 have been fully considered but they are not persuasive.

On pages 6-8 of the Response, Applicant argues that Larsson does not teach “cyclically advancing” limitations of the independent claims, but teaches only “cyclically delaying”, making the claims patentable over Larsson.

Examiner respectfully disagrees.

Larsson teaching is directed to delaying $n-1$, n , $n+1$ OFDM symbols for antenna ANT 2, inherently advancing $n-1$, n , $n+1$ OFDM symbols for antenna Ant 1, as clearly shown on Fig. 9 and disclosed on 7:27-37.

Signal advancing is understood as a relative operation, where a signal is considered to be advanced in comparison with a delayed copy of itself or with delayed reference signal.

There many devices in electronics to delay a signal, but there are no devices capable to accelerate a signal in time.

Applicant provided no details on implementation of signal “advance”, but the operations of “advancing” of OFDM sections, as shown on Fig. 8 or 9, inherently comprise delaying OFDM sections, similar to method of Larsson, as "advancing" without use of delaying operation is physically impossible.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dmitry Levitan whose telephone number is (571) 272-3093. The examiner can normally be reached on 8:30 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dmitry Levitan
Primary Examiner
Art Unit 2416

/Dmitry Levitan/
Primary Examiner, Art Unit 2616

<i>Index of Claims</i> 	Application/Control No. 11121661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.
	Examiner Dmitry Levitan	Art Unit 2616

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.D.
 ☐ R.1.47

CLAIM		DATE								
Final	Original	05/16/2008	10/23/2008							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	✓							
	11	✓	✓							
	12	✓	✓							
	13	✓	✓							
	14	✓	✓							
	15	✓	✓							
	16	✓	✓							
	17	✓	✓							
	18	✓	✓							
	19	✓	✓							
	20	✓	✓							
	21	✓	✓							
	22	✓	✓							
	23	✓	✓							

<i>Search Notes</i> 	Application/Control No. 11121661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.
	Examiner Dmitry Levitan	Art Unit 2616

SEARCHED			
Class	Subclass	Date	Examiner
370	203-210, 310, 342-345	10/23/08	DL
455	562, 101	10/23/08	DL

SEARCH NOTES		
Search Notes	Date	Examiner
IEEE, EAST	10/23/08	DL

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Webster et al.

Serial No.: **11/121,661**

Filed: **05/04/2005**

For: **Cyclic Diversity Systems and Methods**

Confirmation No.: **3553**

Group Art Unit: **2616**

Examiner: **Levitan, Dmitry**

Docket No. **050337-1020**

RESPONSE
TO NON-FINAL OFFICE ACTION

Mail Stop: Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

The outstanding non-final Office Action mailed May 20, 2008 (Paper No. 20080515) has been carefully considered. In response thereto, please enter the following amendments and consider the following remarks. Reconsideration and allowance of the application and presently pending claims, as amended, are respectfully requested.

AUTHORIZATION TO DEBIT ACCOUNT

It is believed that no extensions of time or fees for net addition of claims are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefore (including fees for net addition of claims) are hereby authorized to be charged to deposit account no. 50-0835.

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A cyclic diversity method, comprising:
providing an a first orthogonal frequency division multiplexing (OFDM) packet
corresponding to a first transmit antenna; and
cyclically advancing one or more sections of the first OFDM packet, or ~~performing the a~~
periodic equivalent of ~~the same~~, one or more sections of the first OFDM packet, to produce a
second OFDM packet, one or more sections of the second OFDM packet corresponding to a
second transmit antenna, ~~the a~~ duration of the cyclic advance having a duration less than a
guard interval, the duration corresponding to a number of sample shifts in a cycle.
2. (Currently Amended) The method of claim 1, ~~wherein cyclically advancing comprises~~
further comprising cyclically advancing for a duration of less than approximately 800
nanoseconds.
3. (Currently Amended) The method of claim 1, further comprising transmitting the first
OFDM packet corresponding to the first transmit antenna from the first transmit antenna and
transmitting the second OFDM packet ~~having the one or more cyclically advanced sections~~
from the second transmit antenna.
4. (Currently Amended) The method of claim 1, further comprising transmitting, on
additional transmit antennas, the first OFDM packet corresponding to the first transmit antenna
with cyclic delay, cyclic advance, or linear time delay ~~for the~~ applied to one or more sections of
the first OFDM packet ~~from additional transmit antennas~~.
5. (Currently Amended) The method of claim 1, further comprising determining based on at
least one cyclic extension module whether to transmit the first OFDM packet corresponding to
the first transmit antenna with a cyclic delay, cyclic advance, or a linear time delay applied to
the one or more sections of the first OFDM packet when transmission is to be from additional
transmit antennas.

6. (Currently Amended) The method of claim 1, further comprising transmitting the first OFDM packet corresponding to the first transmit antenna and the second OFDM packet ~~having the one or more cyclically advanced sections corresponding to the second transmit antenna~~ from a multiple-antenna transmitter device.

7. (Currently Amended) The method of claim 1, further comprising receiving the first OFDM packet corresponding to the first transmit antenna and the second OFDM packet ~~having the one or more cyclically advanced sections corresponding to the second transmit antenna~~ and placing a fast Fourier Transform (FFT) in an interval corresponding to the duration of a recovered OFDM symbol corresponding to one of the OFDM packets without shifting the FFT into an adjacent OFDM symbol.

8. (Currently Amended) The method of claim 7, ~~wherein receiving and placing further comprising~~ comprises receiving at a single-input, single-output (SISO) receiver device.

9. (Currently Amended) A cyclic diversity system, comprising:
a logic configured to cyclically advance one or more sections of a first orthogonal frequency division multiplexing (OFDM) packet, or perform the periodic equivalent of the same, ~~one or more sections of an orthogonal frequency division multiplexing (OFDM)~~ the first OFDM packet, to produce a second OFDM packet, the first OFDM packet relative to the OFDM packet to be transmitted on a first transmit antenna, the second OFDM packet having the one or more cyclically advanced sections to be transmitted on a second transmit antenna, the a duration of the cyclic advance having a duration less than a guard interval, the duration corresponding to a number of sample shifts in a cycle.

10. (Currently Amended) The system of claim 9, further comprising transmit logic configured to transmit the first OFDM packet and the second OFDM packet ~~having the one or more cyclically advanced sections~~ on the first transmit antenna and the second transmit antenna, respectively.

11. (Currently Amended) The system of claim 10, ~~wherein the~~ further comprising transmit logic is configured to transmit, on additional transmit antennas, the first OFDM packet with a cyclic delay, cyclic advance, or linear time delay ~~for the~~ applied to one or more sections of the first OFDM packet ~~from additional transmit antennas.~~

12. (Currently Amended) The system of claim 9, ~~wherein the logic is~~ further comprising logic configured to cyclically advance the one or more sections of the second OFDM packet to be transmitted from the second transmit antenna for a duration of less than approximately 800 nanoseconds.

13. (Currently Amended) The system of claim 9, ~~wherein the logic is~~ further comprising logic configured to ~~determine whether to transmit the~~ first OFDM packet with at least one of the following: a cyclic delay, cyclic advance, or a linear time delay applied to the one or more sections of the first OFDM packet.

14. (Currently Amended) The system of claim 9, ~~wherein the system is~~ further comprising the system embodied as a multiple-antenna transmitter device.

15. (Currently Amended) The system of claim 9, further comprising receive logic configured to receive the first OFDM packet corresponding to the first transmit antenna and the second OFDM packet ~~having the one or more cyclically advanced sections~~ corresponding to the second transmit antenna.

16. (Original) The system of claim 15, further comprising processing logic configured to place a fast Fourier Transform (FFT) in an interval corresponding to the duration of an OFDM symbol of one of the received OFDM packets without shifting the FFT into an adjacent OFDM symbol.

17. (Currently Amended) The system of claim 16, ~~wherein~~ further comprising the receive logic and the processing logic is located in a single-input, single-output (SISO) receiver device.

18. (Currently Amended) The system of claim 9, ~~wherein the system comprises~~ further comprising an 802.11 compliant device.

19. (Currently Amended) The system of claim 9, ~~wherein the~~ further comprising logic is configured in hardware, software, or a combination of hardware and software.

20. (Currently Amended) The system of claim 9, ~~wherein the~~ further comprising logic is configured in digital circuitry, analog circuitry, or a combination of digital and analog circuitry.

21. (Currently Amended) A cyclic diversity system, comprising:
means for providing ~~an~~ a first orthogonal frequency division multiplexing (OFDM) segment corresponding to a first transmit antenna; and
means for cyclically advancing one or more sections of the first OFDM segment, or ~~performing the a~~ periodic equivalent of ~~the same~~, one or more sections of the first OFDM segment, to produce a second OFDM segment corresponding to a second transmit antenna, the duration of the cyclic advance having a duration less than a guard interval, the duration corresponding to a number of sample shifts in a cycle.

22. (Currently Amended) The system of claim 21, ~~wherein the segment~~ further comprising: ~~comprises~~ a continuous data stream within the segment.

23. (Currently Amended) The system of claim 21, ~~wherein the segment~~ further comprising: ~~comprises~~ a packet.

REMARKS

Upon entry of the foregoing amendments, claims 1-23 remain pending in the present application. Claims 1-15 and 17-23 are amended herein. No new matter is added to the present application by these amendments. Reconsideration and allowance of all claims are respectfully requested.

I. Claim Rejections – 35 U.S.C. §112

Claims 1-23 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Applicant respectfully traverses this rejection. Claims 1, 5, 9, 13, 21, and 22 are amended to overcome this rejection. Applicant respectfully requests withdrawal of this rejection.

II. Claim Rejections – 35 U.S.C. §102(e)

Claims 1, 3-7, 9-11, 13-16, and 19-23 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Larsson (US 6,842,487). Applicant respectfully traverses this rejection.

A. Independent Claim 1

Claim 1, as amended, explicitly recites: “***cyclically advancing*** the first OFDM packet”. Conversely, *Larsson* discloses “employing **a cyclic delay**”. (*Larsson*, col. 6, lines 26-29.) As illustrated, based on this passage, *Larsson* fails to teach the claimed feature “***cyclically advancing*** the first OFDM packet”.

For at least the reason that *Larsson* fails to disclose, teach, or suggest the above-mentioned feature, Applicant respectfully submits that claim 1 is allowable in view of the cited art. Therefore, Applicant requests that the rejection of claim 1 be withdrawn.

B. Independent claim 9

Claim 9, as amended, explicitly recites “a logic configured to ***cyclically advance***”. Referring to column 6, lines 26-29, *Larsson* discloses “employing **a cyclic delay**”. As illustrated, based on this passage, *Larsson* fails to teach the claimed feature “a logic configured to ***cyclically advance***” explicitly recited in claim 9.

For at least the reason that *Larsson* fails to disclose, teach, or suggest the above-mentioned feature, Applicant respectfully submits that claim 9 is allowable in view of the cited art. Therefore, Applicant requests that the rejection of claim 9 be withdrawn.

C. Independent Claim 21

Claim 21, as amended, explicitly recites a “means for ***cyclically advancing***”. Referring to column 6, lines 26-29, *Larsson* discloses “employing **a cyclic delay**”. As illustrated, based on this passage, *Larsson* fails to teach the claimed feature a “means for ***cyclically advancing***” as recited in claim 21.

For at least the reason that *Larsson* fails to disclose, teach, or suggest the above-mentioned feature, Applicant respectfully submits that claim 21 is allowable in view of the cited art. Therefore, Applicant requests that the rejection of claim 21 be withdrawn.

D. Dependent Claims 3-7, 10-11, 13-16, 19-20, 22-23

Since claim 1 is allowable, Applicant respectfully submits that dependent claims 3-7 are allowable for at least the reason that these claims depend from allowable independent claim 1.

Since claim 9 is allowable, Applicant respectfully submits that dependent claims 10-11, 13-16, and 19-20 are allowable for at least the reason that these claims depend from allowable independent claim 9.

Since claim 21 is allowable, Applicant respectfully submits that dependent claims 22-23 are allowable for at least the reason that these claims depend from allowable independent claim 21. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir.1988).

Therefore, Applicant respectfully requests that the rejection of claims 3-7, 10-11, 13-16, 19-20, and 22-23 be withdrawn.

III. Claim Rejections – 35 U.S.C. §103(a)

A. Dependent Claims 2 and 12

Claims 2 and 12 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Larsson*. Applicant respectfully traverses this rejection.

Since claim 1 is allowable, Applicant respectfully submits that dependent claim 2 is allowable for at least the reason that this claim depends from allowable independent claim 1.

Since claim 9 is allowable, Applicant respectfully submits that dependent claim 12 is allowable for at least the reason that this claim depends from allowable independent claim 9. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

Therefore, Applicant respectfully requests that the rejection of claims 2 and 12 be withdrawn.

B. Dependent Claims 8, 17 and 18

Claims 8, 17, and 18 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Larsson* in view of Admitted Prior Art. Applicant respectfully traverses this rejection.

Applicant respectfully submits that Admitted Prior Art does not overcome the deficiencies of *Larsson* as discussed above in connection with independent claims 1 and 9. For at least this reason, claims 8, 17, and 18 are allowable.

Additionally, since claim 1 is allowable, Applicant respectfully submits that dependent claim 8 is allowable for at least the reason that this claim depends from allowable independent claim 1.

Since claim 9 is allowable, Applicant respectfully submits that dependent claims 17 and 18 are allowable for at least the reason that these claims depend from allowable independent claim 9. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

Therefore, Applicant respectfully requests that the rejection of claims 17 and 18 be withdrawn.

CONCLUSION

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the now pending claims 1-32 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned agent at (770) 933-9500.

Respectfully submitted,


Scott A. Horstemeyer, Reg. No. 34,183

**THOMAS, KAYDEN,
HORSTEMEYER & RISLEY, L.L.P.**
Suite 1500
600 Galleria Parkway N.W.
Atlanta, Georgia 30339
(770) 933-9500

Electronic Acknowledgement Receipt	
EFS ID:	3781988
Application Number:	11121661
International Application Number:	
Confirmation Number:	3553
Title of Invention:	Cyclic diversity systems and methods
First Named Inventor/Applicant Name:	Mark A. Webster
Customer Number:	24504
Filer:	Scott A. Horstemeyer/Julie Campbell
Filer Authorized By:	Scott A. Horstemeyer
Attorney Docket Number:	050337-1020
Receipt Date:	14-AUG-2008
Filing Date:	04-MAY-2005
Time Stamp:	15:33:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment - After Non-Final Rejection	00762221.PDF	324434 11462c3c26fa603001d629efafdc3fb0394eb8b7	no	9

Warnings:

Information:

Total Files Size (in bytes):

324434

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 11/121,661		Filing Date 05/04/2005		☐ To be Mailed				
APPLICATION AS FILED – PART I													
(Column 1)			(Column 2)			SMALL ENTITY ☐ OR		OTHER THAN SMALL ENTITY					
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)					
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A							
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A		N/A		N/A							
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A							
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		X \$ =				OR			
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =				X \$ =			
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).											
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))													
* If the difference in column 1 is less than zero, enter "0" in column 2.													
APPLICATION AS AMENDED – PART II													
(Column 1)			(Column 2)			(Column 3)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	08/14/2008		CLAIMS REMAINING AFTER AMENDMENT				HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA				
	Total (37 CFR 1.16(i))		* 23		Minus		** 23		= 0				
	Independent (37 CFR 1.16(h))		* 3		Minus		*** 3		= 0				
	☐ Application Size Fee (37 CFR 1.16(s))												
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
RATE (\$)		ADDITIONAL FEE (\$)				RATE (\$)		ADDITIONAL FEE (\$)					
X \$ =						OR		X \$50=		0			
X \$ =						OR		X \$210=		0			
						OR							
TOTAL ADD'L FEE						OR		TOTAL ADD'L FEE		0			
(Column 1)			(Column 2)			(Column 3)							
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT				HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA						
	Total (37 CFR 1.16(i))		*		Minus		**		=				
	Independent (37 CFR 1.16(h))		*		Minus		***		=				
	☐ Application Size Fee (37 CFR 1.16(s))												
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
RATE (\$)		ADDITIONAL FEE (\$)				RATE (\$)		ADDITIONAL FEE (\$)					
X \$ =						OR		X \$ =					
X \$ =						OR		X \$ =					
						OR							
TOTAL ADD'L FEE						OR		TOTAL ADD'L FEE					
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.													

Legal Instrument Examiner:
/MARQUETTA MCGEE/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/121,661	05/04/2005	Mark A. Webster	050337-1020	3553

24504	7590	05/20/2008
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP		
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ATLANTA, GA 30339-5994		

EXAMINER	
LEVITAN, DMITRY	

ART UNIT	PAPER NUMBER
2616	

MAIL DATE	DELIVERY MODE
05/20/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 11/121,661		Applicant(s) WEBSTER ET AL.	
	Examiner Dmitry Levitan		Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 04 May 2005.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-23 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 04 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 9 and 21 recite the limitations "the periodic equivalent" in corresponding lines. There is insufficient antecedent basis for this limitation in the claim.

Claims 1, 9 and 21 recite the limitation "the same" in corresponding lines. There is insufficient antecedent basis for this limitation in the claim.

Claims 1, 9 and 21 limitations, directed to "performing the periodic equivalent of the same" is unclear as it is not understood what operations are considered equivalent and what are not.

Claims 1, 9 and 21 recite the limitation "the duration of the cyclic advance" in corresponding lines. There is insufficient antecedent basis for this limitation in the claim.

In addition, it is unclear what is duration of the cyclic advance: is the duration is a number of shifted samples in the cycle, or the time needed to perform one cycle operation.

Claims 5 and 13 limitations, directed to the step of "determining" are unclear, because the claims limitations lack basis/conditions for making a decision/determination.

Claim 22 limitations, directed to "the segment comprising a continuous data stream" are unclear because the limitations are self contradictory, as segment, known as a portion or part, cannot comprise a continuous element, as a continuous element is larger than its portion.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 1, 3-7, 9-11, 13-16 and 19-23 are rejected (as best understood) under 35 U.S.C. 102(e) as being anticipated by Larsson (US 6,842,487).

5. Regarding claims 1, 9 and 21, Larsson teaches a method and a system, performing a cyclic diversity operation (as shown on Fig. 9 and disclosed on 6:58-7:25) comprising:

providing a OFDM packet corresponding to first transmit antenna (providing one of OFDM symbols: $n-1$, n or $n+1$ to first transmit antenna Ant1 TX, as shown on Fig. 9, the antenna that has no cyclic operation, as shown on Fig. 8 and 9 and disclosed on 6:49-57)

performing a periodic cyclic advancing operation on one or more sections of the OFDM packet corresponding to a second transmit antenna (performing cyclic delay operation on the

same OFDM symbol corresponding to a second transmit antenna Ant 2 TX, as shown on Fig. 8 and 9 by shifting the OFDM samples, as described on 6:40-57), wherein the duration of the periodic cyclic advance operation is less than a guard interval (performing 1 sample cyclic delay operation, which is less than the cyclic prefix, identified as guard interval on 1:30-32, as the length of the cyclic prefix (CP) is three samples, as clearly shown on Fig. 8).

In addition, regarding claims 9 and 21, Larsson teaches logic and means to perform the steps of the method, as disclosed above, in a system, shown on Fig. 9 and disclosed on 6:58-7:26.

6. Regarding claims 3- 6, 10, 11, 13 and 14, Larsson teaches using multiple transmit antennas with cyclic delay operations performed by corresponding Cyclic delay sections on OFDM symbols, as shown on Fig. 9.

7. Regarding claims 7, 15 and 16, Larsson teaches receiving the OFDM packets/symbols from first and second transmit antennas, Ant 1 TX and Ant 2 TX, on receive antenna Ant 1 RX and performing FFT in the windows corresponding to the recovered OFDM symbols/packets, as clearly shown on Fig. 9.

8. Regarding claims 19 and 20, Larsson teaches a system including attenuators, IFFT and cyclic delay blocks, as shown on Fig. 9, which are inherently comprise hardware and digital circuitry, because hardware and digital circuitry are essential for the system operation.

9. Regarding claims 22 and 23, Larsson teaches a stream of OFDM symbols/packets, as shown on Fig. 1, 2 and 9.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson. Larsson substantially teaches the limitations of the parent claims (see claims 1 and 9 rejections above).

Larsson does not teach using duration of cyclically advancing step less than 800 nanoseconds.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using duration of cyclically advancing step less than 800 nanoseconds to the system of Larsson as a design choice as the duration of less than 600 or 700 nanoseconds will work in the system as well.

12. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson in view of Admitted Prior Art (Current application, Fig. 1-5 and pages 1-7).

Larsson substantially teaches the limitations of the parent claims (see claims 1, 7, 9, 15 and 16 rejections above), including use of a single input receiver, as shown on Fig. 9 and disclosed on 7:14-25.

Larsson does not teach using single-input, single-output (SISO) receiver.

Admitted Prior Art teaches legacy SISO receivers to be considered/used with multiple antennas systems on Fig. 1 and pages 1 and 2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using single-input, single-output (SISO) receiver of Admitted Prior Art to the system of Larsson to improve the system compatibility with existing SISO receivers.

13. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson in view of Admitted Prior Art (Current application, Fig. 1-5 and pages 1-7).

Larsson substantially teaches the limitations of the parent claims (see claim 9 rejections above). Larsson does not teach using 802.11 compliant device.

Admitted Prior Art teaches using 802.11 receiver device, as shown on Fig. 1 and pages 1 and 2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add using 802.11 compliant, single-input, single-output (SISO) receiver of Admitted Prior Art to the system of Larsson to improve the system compatibility with existing receivers, utilizing 802.11 standard.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dmitry Levitan whose telephone number is (571) 272-3093. The examiner can normally be reached on 8:30 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dmitry Levitan
Primary Examiner
Art Unit 2616

/Dmitry Levitan/
Primary Examiner, Art Unit 2616

Notice of References Cited	Application/Control No. 11/121,661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.	
	Examiner Dmitry Levitan	Art Unit 2616	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,842,487 B1	01-2005	Larsson, Peter	375/260
*	B	US-2005/0157682 A1	07-2005	Sandhu, Sumeet	370/334
*	C	US-2006/0221898 A1	10-2006	Bossert et al.	370/330
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<i>Index of Claims</i> 	Application/Control No. 11121661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.
	Examiner Dmitry Levitan	Art Unit 2616

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☐ T.D.
 ☐ R.1.47

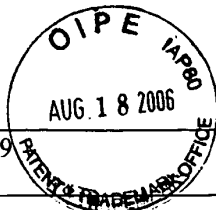
CLAIM		DATE									
Final	Original	05/16/2008									
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	2	✓									
	3	✓									
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	7	✓									
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	22	✓									
	23	✓									

<i>Search Notes</i> 	Application/Control No. 11121661	Applicant(s)/Patent Under Reexamination WEBSTER ET AL.
	Examiner Dmitry Levitan	Art Unit 2616

SEARCHED			
Class	Subclass	Date	Examiner
370	203-210, 310, 342-345	5/16/08	DL
455	562, 101	5/16/08	DL

SEARCH NOTES		
Search Notes	Date	Examiner
IEEE, EAST	5/16/08	DL

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner



Form PTO-1449				Attorney Docket No. 50337-1020		Serial No. 11/121/661		
INFORMATION DISCLOSURE CITATION				Applicant Webster et al.				
(Use several sheets if necessary)				Filing Date May 4, 2005		Group TBA		
U.S. PATENT DOCUMENTS								
Examiner Initials	Item	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate	
	A	US 2002/0136276 A 1	09/26/02	Franceschini, et al.	375	148	03/08/01	
	B	US 6,754,170 B1	06/22/04	Ward	370	208	09/29/00	
	C	US 6,574,237 B1	06/03/03	Bullman, et al.	370	465	06/30/99	
	D	US 2003/0012160 A1	01/16/03	Webster, et al.	370	335	05/10/02	
	E	US 2003/0016621 A1	01/23/03	Li	370	203	05/21/01	
	F	US 2003/0072284 A1	04/17/03	Webster, et al.	370	335	07/09/02	
	G	US 2003/0185241 A1	10/02/03	Lu, et al.	370	476	08/16/02	
	H							
	I							
	J							
	K							
FOREIGN PATENT DOCUMENTS								
		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
	L							
	M							
	N							
	O							
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)								
	P	WEBSTER, et al., "LEGACY COMPATIBLE SPATIAL MULTIPLEXING SYSTEMS AND METHODS," having serial number 11/159,812, filed June 22, 2005.						
	Q	WEBSTER, et al., "SYSTEMS AND METHODS FOR TRANSMITTER DIVERSITY EXPANSION," having serial number 11/411,619, filed April 26, 2006.						
No date.	R	WEBSTER, et al. "PACKET GENERATION SYSTEMS AND METHODS," having serial number 11/106,915, filed April 15, 2005.						
	S	~~IEEE 802.11 Task Group N Meeting Update, http://groups.ieee.org/groups/802/11/Reports/task_update.htm, pp. 1-7~~						
	T	Jon Rosdahl, "Draft PAR for High Throughput Study Group," November 15, 2002, Revision R1: January 16, 2003, IEEE 802.11-02/798r1, pp. 1-9.						
	U	Jon Rosdahl, "Draft PAR for High Throughput Study Group," November 15, 2002, Revision R6: March 13, 2003, IEEE 802.11-02/798r6, pp. 1-8.						
	V	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, IEEE 802.11-02/799r0, pp. 1-4.						

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.L./

W	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 1: January 16, 2003, IEEE 802.11-02/799r1, pp. 1-4.		
X	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 1: January 16, 2003, IEEE 802.11-02/799r2, pp. 1-5.		
Y	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 4: March 11, 2003, IEEE 802.11-02/799r3, pp. 1-4.		
Z	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 5: March 13, 2003, IEEE 802.11-02/799r5, pp. 1-4.		
AA	IEEE Std 802 [®] -2001, "802 [®] IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture," IEEE Computer Society, March 8, 2002		
BB	Manoneet Singh, et al. and Bruce Edwards, et al., "WwiSE proposal: High throughput extension to the 802.11," IEEE 11-04-0886-00-000n, August 13, 2004.		
CC	Syed Aon Mujtaba, "TGn Sync Proposal Technical Specification," IEEE 802.11-04/889r0, August 13, 2004.		
DD	Aon Mujtaba, Adrian P. Stephens, Alek Purkovic, Andrew Myles, Brian Johnson, Daisuke Takeda, Darren McNamara, Dongjun (DJ) Lee, David Bagby, Eldad Perahia, Huanchun Ye, Hui-Ling Lou, James Chen, James Mike Wilson, Jan Boer, Jari Jokela, Jeff Gilbert, Joe Pitarressi, Jorg Habetha, John Sadowsky, Jon Rosdahl, Luke Qian, Mary Cramer, Masahiro Takagi, Monisha Ghosh, Nico van Waes, Osama Aboul-Magd, Paul Feinberg, Pen Li, Peter Loc, Pieter-Paul Giesberts, Richard van Leeuwen, Ronald Rietman, Seigo Nakao, Sheung Li, Stephen Shellhammer, Takushi Kunihior, Teik-Kheong, Tomoko Adachi, Tomoya Yamaura, Tsuguhide Aoki, Won-Joon Choi, Xiaowen Wang, Yasuhiko Tanabe, Yasuhiro Tanaka, Yoshiharu Doi, Yichi Morioka, Youngsoo Kim, "TGn Sync Proposal," IEEE 802.11-04/888r0, August 13, 2004.		
EE	VK Jones, Neil Hamady, Jason Trachewsky, Michael Seals, Stephan ten Brink, George Vlantis, Sean Coffey, "WwiSE IEEE 802.11n Proposal," IEEE 802.11-04/0935r3, September 16, 2004.		
* EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.			
<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">EXAMINER'S SIGNATURE: /Dmitry Levitan/</td> <td style="width: 50%;">DATE CONSIDERED: 05/15/2008</td> </tr> </table>		EXAMINER'S SIGNATURE: /Dmitry Levitan/	DATE CONSIDERED: 05/15/2008
EXAMINER'S SIGNATURE: /Dmitry Levitan/	DATE CONSIDERED: 05/15/2008		
Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE			

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.L./



Form PTO-1449

Attorney Docket No.
50337-1020Serial No.
11/121,661**INFORMATION DISCLOSURE CITATION**Applicant
Webster et al.*(Use several sheets if necessary)*Filing Date
05/04/05Group
To Be Assigned**U.S. PATENT DOCUMENTS**

Examiner Initials	Item	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	A	US 2004/0047284	03/11/04	Eidson	370	203	
	B	US 2004/0266339	12/30/04	Larsson	455	7	
	C	6,842,487	01/11/05	Larsson	375	260	
	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
	L							
	M							
	N							
	O							

OTHER DOCUMENTS *(Including Author, Title, Date, Pertinent Pages, etc.)*

	P	Forms PCT/ISA/220, PCT/ISA/210 and PCT/ISA/237
	Q	ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.L./
	R	

* EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

EXAMINER'S SIGNATURE: /Dmitry Levitan/

DATE CONSIDERED: 05/15/2008

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BIB DATA SHEET

CONFIRMATION NO. 3553

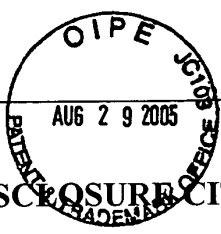
SERIAL NUMBER 11/121,661	FILING or 371(c) DATE 05/04/2005 RULE	CLASS 370	GROUP ART UNIT 2616	ATTORNEY DOCKET NO. 050337-1020		
APPLICANTS Mark A. Webster, Indian Harbor Beach, FL; Michael J. Seals, Melbourne, FL; ** CONTINUING DATA ***** This appln claims benefit of 60/572,481 05/20/2004 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 05/26/2005						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☒ Yes ☐ No Verified and /DMITRY LEVITAN/ Acknowledged Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY FL	SHEETS DRAWINGS 11	TOTAL CLAIMS 23	INDEPENDENT CLAIMS 3
ADDRESS THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 600 GALLERIA PARKWAY, S.E. STE 1500 ATLANTA, GA 30339-5994 UNITED STATES						
TITLE Cyclic diversity systems and methods						
FILING FEE RECEIVED 1150	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit			

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L4	20	ofdm and ((periodic or cyclic) near2 (advanc\$5 or divers\$5 or delay)) and guard \$5 and antenna and @ay< "2005"	US-PGPUB; USPAT	OR	ON	2008/05/16 13:20
L8	27	ofdm and (((periodic or cyclic)) near2 (time or timing or duration or interval or period or length)) near3 guard) and antenna and mimo and @ay< "2005"	US-PGPUB; USPAT	OR	ON	2008/05/16 13:39
S8	44	ofdm and ((periodic or cyclic) near2 (advanc\$5 or divers\$5)) and @ay< "2006"	US-PGPUB; USPAT	OR	ON	2008/05/15 10:48
S10	14	ofdm and antenna and ((periodic or cyclic) near2 (advanc\$5 or divers\$5)) and @ay< "2005"	US-PGPUB; USPAT	OR	ON	2008/05/15 10:49
S12	3	ofdm and antenna and ((periodic\$4 or cyclic\$4) near2 (advanc\$5 or divers\$5)) and guard\$5 and @ay< "2005"	US-PGPUB; USPAT	OR	ON	2008/05/15 10:55

5/ 16/ 08 1:43:20 PM

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Form PTO-1449				Attorney Docket No. 50337-1020		Serial No. 11/121,661	
INFORMATION DISCLOSURE CITATION <i>(Use several sheets if necessary)</i>				Applicant Webster, et al.			
				Filing Date 05/04/2005		Group 2661	
U.S. PATENT DOCUMENTS							
Examiner Initials	Item	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
FOREIGN PATENT DOCUMENTS							
		Document Number	Date	Country	Class	Subclass	Translation Yes No
No date. OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)							
	A	~~IEEE 802.11 Task Group N Meeting Update http://grouper.ieee.org/groups/802/11/Reports/tgn_update.htm, pp. 1-7.~~					
	B	Jon Rosdahl, "Draft PAR for High Throughput Study Group," November 15, 2002, Revision R1: January 16, 2003, IEEE 802.11-02/798r1, pp. 1-9.					
	C	Jon Rosdahl, "Draft PAR for High Throughput Study Group," November 15, 2002, Revision R6: March 13, 2003, IEEE 802.11-02/798r6, pp. 1-8.					
	D	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, IEEE 802.11-02/799r0, pp. 1-4.					
	E	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 1: January 16, 2003, IEEE 802.11-02/799r1, pp. 1-4.					
	F	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 1: January 16, 2003, IEEE 802.11-02/799r2, pp. 1-5.					
	G	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 4: March 11, 2003, IEEE 802.11-02/799r3, pp. 1-4.					
	H	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 5: March 13, 2003, IEEE 802.11-02/799r5, pp. 1-4.					
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EXAMINER'S SIGNATURE: /Dmitry Levitan/				DATE CONSIDERED: 05/15/2008			

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Form PTO-1449 INFORMATION DISCLOSURE CITATION <i>(Use several sheets if necessary)</i>				Attorney Docket No. 50337-1020		Serial No. TBA	
				Applicant 11/121, 661 Webster, et al.			
				Filing Date May 4, 2005		Group TBA	
U.S. PATENT DOCUMENTS							
Examiner Initials	Item	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
FOREIGN PATENT DOCUMENTS							
		Document Number	Date	Country	Class	Subclass	Translation Yes No
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)							
	A	IEEE Std 802®-2001, "802® IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture," IEEE Computer Society, March 8, 2002					
	B	Manoneet Singh, et al. and Bruce Edwards, et al., "WwiSE proposal: High throughput extension to the 802.11," IEEE 11-04-0886-00-000n, August 13, 2004.					
	C	Syed Aon Mujtaba, "TGN Sync Proposal Technical Specification," IEEE 802.11-04/889r0, August 13, 2004.					
	D	Aon Mujtaba, Adrian P. Stephens, Alek Purkovic, Andrew Myles, Brian Johnson, Daisuke Takeda, Darren McNamara, Dongjun (DJ) Lee, David Bagby, Eldad Perahia, Huanchun Ye, Hui-Ling Lou, James Chen, James Mike Wilson, Jan Boer, Jari Jokela, Jeff Gilbert, Joe Pitarressi, Jorg Habetha, John Sadowsky, Jon Rosdahl, Luke Qian, Mary Cramer, Masahiro Takagi, Monisha Ghosh, Nico van Waes, Osama Aboul-Magd, Paul Feinberg, Pen Li, Peter Loc, Pieter-Paul Giesberts, Richard van Leeuwen, Ronald Rietman, Seigo Nakao, Sheung Li, Stephen Shellhammer, Takushi Kunihiior, Teik-Kheong, Tomoko Adachi, Tomoya Yamaura, Tsuguhide Aoki, Won-Joon Choi, Xiaowen Wang, Yasuhiko Tanabe, Yasuhiro Tanaka, Yoshiharu Doi, Yichi Morioka, Youngsoo Kim, "TGN Sync Proposal," IEEE 802.11-04/888r0, August 13, 2004.					
	E	VK Jones, Neil Hamady, Jason Trachewsky, Michael Seals, Stephan ten Brink, George Vlantis, Sean Coffey, "WwiSE IEEE 802.11n Proposal," IEEE 802.11-04/0935r3, September 16, 2004.					
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IFW
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

WEBSTER, *et al.*

Serial Number: 11/121,661

Filing Date: May 4, 2005

Title: Cyclic Diversity Systems and Methods



Confirmation: 3553

Art Unit: 2661

Examiner: TBA

Docket No.: 50337-1020

INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

This information disclosure statement is filed in accordance with 37 C.F.R. §§ 1.56, 1.97, and 1.98, and specifically:

- ☒ under 37 CFR 1.97(b), or
(within Three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; whichever occurs last)
- ☐ under 37 CFR 1.97(c) together with either a:
☐ Statement Under 37 C.F.R. 1.97(e), or
☐ a \$180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before the final office action or notice of allowance, whichever occurs first)
- ☐ under 37 CFR 1.97(d) together with a:
☐ Statement under 37 CFR 1.97(e), and
☐ a \$180.00 petition fee set forth in 37 CFR 1.17(p).
(Filed after final office action or notice of allowance, whichever occurs first, but before payment of the issue fee)

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- ☐ Enclosed is Credit Card Payment Form (PTO-2038) in the amount of \$
- ☐ Please charge \$ to deposit account
- ☒ At any time during the pendency of this application, please charge any fees required to Deposit Account 20-0778 pursuant to 37 CFR 1.25. The Commissioner is hereby requested to credit any overpayment to Deposit Account No.20-0778.
- ☒ Applicant(s) submit herewith *Form PTO 1449A - Information Disclosure Statement by Applicant* together with copies (where required) of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may or may not be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56. As required by 37 C.F.R. §1.98(a), a legible copy of each document is provided.

- ☐ A concise explanation of the relevance of foreign language patents, foreign language publications and other foreign language information listed on PTO Form 1449, as presently understood by the individual(s) designated in 37 CFR 1.56(c) most knowledgeable about the content is given on the attached sheet, or where a foreign language patent is cited in a search report or other action by a foreign patent office in a counterpart foreign application, an English language version of the search report or action which indicates the degree of relevance found by the foreign office is listed on the form PTO 1449 and is enclosed herewith.

The following rights are reserved by the Applicant(s): the right to establish the patentability of the claimed invention over any of the listed documents should they be applied as reference, and/or the right to prove that some of these documents may not be prior art, and/or the right to prove that some of these documents may not be enabling for the teachings they purport to offer.

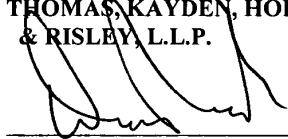
This statement should not be construed as a representation that an exhaustive search has been made, or that information more material to the examination of the present application does not exist. Any statements or identifications regarding the relevance of any portion(s) of cited references should not be construed as a representation that the most relevant portion(s) have been identified, and the absence of such statements or identifications should not be construed as representations that there are no relevant portion(s). The Examiner is specifically requested not to rely solely on the materials submitted herewith. The Examiner is requested to conduct an independent and thorough review of the documents, and to form independent opinions as to their significance.

It is requested that the information disclosed herein be made of record in this application and that the Examiner initial and return a copy of the enclosed PTO-1449 to indicate the documents have been considered.

Respectfully Submitted,

**THOMAS KAYDEN, HORSTEMEYER
& RISLEY, L.L.P.**

By:

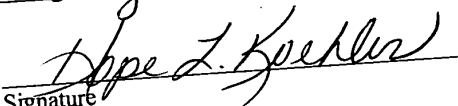


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Form PTO-1449				Attorney Docket No. 50337-1020		Serial No. 11/121/661		
INFORMATION DISCLOSURE CITATION				Applicant Webster et al.				
(Use several sheets if necessary)				Filing Date May 4, 2005		Group TBA		
U.S. PATENT DOCUMENTS								
Examiner Initials	Item	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate	
	A	US 2002/0136276 A 1	09/26/02	Franceschini, et al.	375	148	03/08/01	
	B	US 6,754,170 B1	06/22/04	Ward	370	208	09/29/00	
	C	US 6,574,237 B1	06/03/03	Bullman, et al.	370	465	06/30/99	
	D	US 2003/0012160 A1	01/16/03	Webster, et al.	370	335	05/10/02	
	E	US 2003/0016621 A1	01/23/03	Li	370	203	05/21/01	
	F	US 2003/0072284 A1	04/17/03	Webster, et al.	370	335	07/09/02	
	G	US 2003/0185241 A1	10/02/03	Lu, et al.	370	476	08/16/02	
	H							
	I							
	J							
	K							
FOREIGN PATENT DOCUMENTS								
		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
	L							
	M							
	N							
	O							
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)								
	P	WEBSTER, et al., "LEGACY COMPATIBLE SPATIAL MULTIPLEXING SYSTEMS AND METHODS," having serial number 11/159,812, filed June 22, 2005.						
	Q	WEBSTER, et al., "SYSTEMS AND METHODS FOR TRANSMITTER DIVERSITY EXPANSION," having serial number 11/411,619, filed April 26, 2006.						
	R	WEBSTER, et al. "PACKET GENERATION SYSTEMS AND METHODS," having serial number 11/106,915, filed April 15, 2005.						
	S	IEEE P802.11-Task Group N-Meeting Update, http://grouper.ieee.org/groups/802/11/Reports/tgn_update.htm , pp. 1-7.						
	T	Jon Rosdahl, "Draft PAR for High Throughput Study Group," November 15, 2002, Revision R1: January 16, 2003, IEEE 802.11-02/798r1, pp. 1-9.						
	U	Jon Rosdahl, "Draft PAR for High Throughput Study Group," November 15, 2002, Revision R6: March 13, 2003, IEEE 802.11-02/798r6, pp. 1-8.						
	V	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, IEEE 802.11-02/799r0, pp. 1-4.						

W	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 1: January 16, 2003, IEEE 802.11-02/799r1, pp. 1-4.
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Y	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 4: March 11, 2003, IEEE 802.11-02/799r3, pp. 1-4.
Z	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 5: March 13, 2003, IEEE 802.11-02/799r5, pp. 1-4.
AA	IEEE Std 802 [®] -2001, "802 [®] IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture," IEEE Computer Society, March 8, 2002
BB	Manoneet Singh, et al. and Bruce Edwards, et al., "WwiSE proposal: High throughput extension to the 802.11," IEEE 11-04-0886-00-000n, August 13, 2004.
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DD	Aon Mujtaba, Adrian P. Stephens, Alek Purkovic, Andrew Myles, Brian Johnson, Daisuke Takeda, Darren McNamara, Dongjun (DJ) Lee, David Bagby, Eldad Perahia, Huanchun Ye, Hui-Ling Lou, James Chen, James Mike Wilson, Jan Boer, Jari Jokela, Jeff Gilbert, Joe Pitarressi, Jorg Habetha, John Sadowsky, Jon Rosdahl, Luke Qian, Mary Cramer, Masahiro Takagi, Monisha Ghosh, Nico van Waes, Osama Aboul-Magd, Paul Feinberg, Pen Li, Peter Loc, Pieter-Paul Giesberts, Richard van Leeuwen, Ronald Rietman, Seigo Nakao, Sheung Li, Stephen Shellhammer, Takushi Kunihior, Teik-Kheong, Tomoko Adachi, Tomoya Yamaura, Tsuguhide Aoki, Won-Joon Choi, Xiaowen Wang, Yasuhiko Tanabe, Yasuhiro Tanaka, Yoshiharu Doi, Yichi Morioka, Youngsoo Kim, "TGn Sync Proposal," IEEE 802.11-04/888r0, August 13, 2004.
EE	VK Jones, Neil Hamady, Jason Trachewsky, Michael Seals, Stephan ten Brink, George Vlantis, Sean Coffey, "WwiSE IEEE 802.11n Proposal," IEEE 802.11-04/0935r3, September 16, 2004.
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IFW

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Webster et al.

Serial No.: 11/121,661

Filed: May 4, 2005

For: Cyclic Diversity Systems an Methods



Group Art Unit: To Be Assigned

Examiner: To Be Assigned

Docket No.: 50337-1020

INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

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This information disclosure statement is filed in accordance with 37 C.F.R. §§ 1.56, 1.97, and 1.98, and specifically:

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(within Three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; whichever occurs last)
- ☐ under 37 CFR 1.97(c) together with either a:
 - ☐ Statement Under 37 C.F.R. 1.97(e), or
 - ☐ a \$180.00 fee under 37 CFR 1.17(p), or
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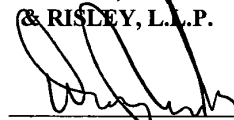
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Respectfully Submitted,

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& RISLEY, L.L.P.**

By:

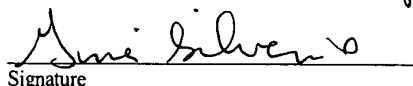


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on January 12, 2006

Gina Silverio
Gina Silverio

In Re Application Of: Webster, et al.

Group No.: 2661

Serial No.: 11/121,661

Docket No. 50337-1020

Filed: May 4, 2005

Confirmation No.: 3553

For: Cyclic Diversity Systems And Methods

The following is a list of documents enclosed:

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Information Disclosure Statement
Form PTO-1449
Prior Cited Art (3 References)

Further, the Commissioner is authorized to charge Deposit Account No. 20-0778 for any additional fees required. The Commissioner is requested to credit any excess fee paid to Deposit Account No. 20-0778.



Form PTO-1449

Attorney Docket No.
50337-1020Serial No.
11/121,661**INFORMATION DISCLOSURE CITATION**Applicant
Webster et al.*(Use several sheets if necessary)*Filing Date
05/04/05Group
To Be Assigned**U.S. PATENT DOCUMENTS**

Examiner Initials	Item	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
	A	US 2004/0047284	03/11/04	Eidson	370	203	
	B	US 2004/0266339	12/30/04	Larsson	455	7	
	C	6,842,487	01/11/05	Larsson	375	260	
	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						

FOREIGN PATENT DOCUMENTS

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EXAMINER'S SIGNATURE:

DATE CONSIDERED:

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on Aug. 24, 2005

Marianne Boland
Marianne Boland

In Re Application Of: Webster, et al.

Group No.: 2661

Serial No.: 11/121,661

Docket No. 50337-1020

Filed: May 4, 2005

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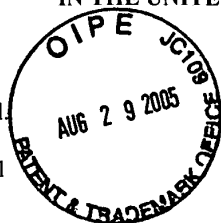
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In Re Application of:

Webster, et al.

Serial No.: 11/121,661

Filed: 05/04/2005



Confirmation No.: 3553

Group Art Unit: 2661

Examiner: TBA

Docket No.: 50337-1020

For: Cyclic Diversity Systems And Methods

INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, Virginia 22313-1450

Sir:

This information disclosure statement is filed in accordance with 37 C.F.R. §§ 1.56, 1.97, and 1.98, and specifically:

- ☒ under 37 CFR 1.97(b), or
 (within Three months of filing national application; or date of entry of international application; or before
 mailing date of first office action on the merits; whichever occurs last)
- ☐ under 37 CFR 1.97(c) together with either a:
☐ Statement Under 37 C.F.R. 1.97(e), or
☐ a \$180.00 fee under 37 CFR 1.17(p), or
 (After the CFR 1.97(b) time period, but before the final office action or notice of allowance, whichever
 occurs first)
- ☐ under 37 CFR 1.97(d) together with a:
☐ Statement under 37 CFR 1.97(e), and
☐ a \$180.00 petition fee set forth in 37 CFR 1.17(p).
 (Filed after final office action or notice of allowance, whichever occurs first, but before payment of the
 issue fee)

Enclosed is a check in the amount of \$.

Enclosed is Credit Card Payment Form (PTO-2038) in the amount of \$.

Please charge \$ to deposit account . At any time during the pendency of this application, please charge any
 fees required to Deposit Account 20-0778 pursuant to 37 CFR 1.25. The Commissioner is hereby requested to credit any
 overpayment to Deposit Account No. 20-0778.

- ☒ Applicant(s) submit herewith *Form PTO 1449A - Information Disclosure Statement by Applicant* together with copies
 (where required) of patents, publications or other information of which applicant(s) are aware, which applicant(s)
 believe(s) may or may not be material to the examination of this application and for which there may be a duty to disclose
 in accordance with 37 CFR 1.56. As required by 37 C.F.R. §1.98(a), a legible copy of each document is provided.
- ☐ A concise explanation of the relevance of foreign language patents, foreign language publications and
 other foreign language information listed on PTO Form 1449, as presently understood by the individual(s) designated in
 37 CFR 1.56(c) most knowledgeable about the content is given on the attached sheet, or where a foreign language patent
 is cited in a search report or other action by a foreign patent office in a counterpart foreign application, an English

language version of the search report or action which indicates the degree of relevance found by the foreign office is listed on the form PTO 1449 and is enclosed herewith.

The following rights are reserved by the Applicant(s): the right to establish the patentability of the claimed invention over any of the listed documents should they be applied as reference, and/or the right to prove that some of these documents may not be prior art, and/or the right to prove that some of these documents may not be enabling for the teachings they purport to offer.

This statement should not be construed as a representation that an exhaustive search has been made, or that information more material to the examination of the present application does not exist. Any statements or identifications regarding the relevance of any portion(s) of cited references should not be construed as a representation that the most relevant portion(s) have been identified, and the absence of such statements or identifications should not be construed as representations that there are no relevant portion(s). The Examiner is specifically requested not to rely solely on the materials submitted herewith. The Examiner is requested to conduct an independent and thorough review of the documents, and to form independent opinions as to their significance.

It is requested that the information disclosed herein be made of record in this application and that the Examiner initial and return a copy of the enclosed PTO-1449 to indicate the documents have been considered.

Respectfully Submitted,

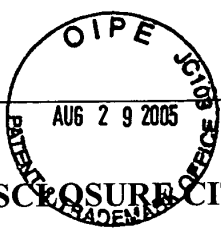
**THOMAS, KAYDEN, HORSTEMEYER
& RISLEY, L.L.P.**

By:



David Rodack, Reg. No. 47,034

100 Galleria Parkway, Suite 1750
Atlanta, Georgia 30339-5948
770-933-9500

Form PTO-1449  INFORMATION DISCLOSURE CITATION (Use several sheets if necessary)		Attorney Docket No. 50337-1020		Serial No. 11/121,661	
		Applicant Webster, et al.			
		Filing Date 05/04/2005		Group 2661	

U.S. PATENT DOCUMENTS							
Examiner Initials	Item	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate

FOREIGN PATENT DOCUMENTS							
		Document Number	Date	Country	Class	Subclass	Translation
							Yes No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)		
A	IEEE P802.11-Task Group N-Meeting Update, http://grouper.ieee.org/groups/802/11/Reports/tgn_update.htm , pp. 1-7.	
B	Jon Rosdahl, "Draft PAR for High Throughput Study Group," November 15, 2002, Revision R1: January 16, 2003, IEEE 802.11-02/798r1, pp. 1-9.	
C	Jon Rosdahl, "Draft PAR for High Throughput Study Group," November 15, 2002, Revision R6: March 13, 2003, IEEE 802.11-02/798r6, pp. 1-8.	
D	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, IEEE 802.11-02/799r0, pp. 1-4.	
E	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 1: January 16, 2003, IEEE 802.11-02/799r1, pp. 1-4.	
F	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 1: January 16, 2003, IEEE 802.11-02/799r2, pp. 1-5.	
G	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 4: March 11, 2003, IEEE 802.11-02/799r3, pp. 1-4.	
H	Jon Rosdahl, "Criteria For Standards Development," (FIVE CRITERIA) November 15, 2002, Revision 5: March 13, 2003, IEEE 802.11-02/799r5, pp. 1-4.	

* EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

EXAMINER'S SIGNATURE:	DATE CONSIDERED:
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Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UTILITY PATENT APPLICATION TRANSMITTAL (Only for new nonprovisional applications under 37 CFR 1.53(b))	Attorney Docket No.	050337-1020
	First Inventor	Webster et al.
	Title	CYCLIC DIVERSITY SYSTEMS AND METHODS
	Express Mail Label No.	EV558411326US

APPLICATION ELEMENTS See MPEP Chapter 600 concerning utility patent application contents	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450
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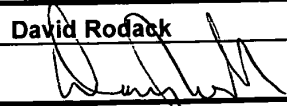
1. ☒ Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original, and a duplicate for fee processing)	23	9. ☒ Assignment Papers (cover sheet & Documents(s)) Name of Assignee <u>Conexant Systems, Inc.</u> <u>4311 Jamboree Road, Newport Beach, CA 92660-3095</u>
2. ☐ Applicant claims small entity status. See CFR 1.27		10. ☐ 37 CFR 3.73(b) Statement (when there is an assignee) ☐ Power of Attorney
3. ☒ Specification (preferred arrangement set forth below) Both the claims and abstract must start on a new page (For Example on the preferred arrangement see MPEP 608.01(a))		11. ☐ English Translation Document (if applicable)
4. ☒ Drawing(s) (35 USC 113) [Total Sheets 11]		12. ☒ Information Disclosure Statement (IDS)/PTO-1449 ☒ Copies of citations attached
5. Oath or Declaration [Total Pages 3] a. ☒ Newly Executed (original or copy) b. ☐ Copy from a prior application (37 CFR §1.63(d)) (for continuation/divisional with Box 18 completed) DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b). i. ☐		13. ☐ Preliminary Amendment
6. ☐ Application Data Sheet. See 37 CFR 1.76		14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)
7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)		15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed)
8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary) a. ☐ Computer Readable Copy (CRF) b. Specification Sequence Listing on: i. ☐ CD-ROM or CD-R (2 copies); or ii. ☐ Paper c. ☐ Statements verifying identity of above copies		16. ☐ Nonpublication Request under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.
		17. ☐ Other:

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No: /
Prior application information: Examiner _____ Group / Art Unit: _____

19. CORRESPONDENCE ADDRESS	
☒ Customer Number: 24504	OR ☐ Correspondence address below:

NAME	Scott A. Horstemeyer		
	Thomas, Kayden, Horstemeyer & Risley, L.L.P.		
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Atlanta	Georgia	30339-5948	
COUNTRY	TELEPHONE	FAX	
U.S.A.	770-933-9500	770-951-0933	

Name (Print/Type)	David Rodack	Registration No. (Attorney/Agent)	47,034
Signature		Date	5-4-05

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 1.22 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Effective on 12/08/2004

Fees Pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005**Complete if Known**☐ Applicant claims small entity status. See 37 CFR 1.27**TOTAL AMOUNT OF PAYMENT (\$)** 1,190.00

Application Number	To Be Assigned
Filing Date	May 4, 2005
First Named Inventor	Webster et al.
Examiner Name	To Be Assigned
Art Unit	To Be Assigned
Attorney Docket No.	050337-1020

METHOD OF PAYMENT (check all that apply)☐ Check ☒ Credit Card ☐ Money Order ☐ None ☐ Other (please identify):☐ Deposit Account Deposit Account Number: 20-0778 Deposit Account Name: Thomas, Kayden, Horstemeyer Risley, L.L.P.

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below☐ Charge fee(s) indicated below, except for the filing fee☒ Charge any additional fee(s) or underpayments of fee(s)
under 37 CFR 1.16 and 1.17☒ Credit any overpayments**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	Filing Fees		Search Fees		Examination Fees		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	1,000.00
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESSIVE CLAIM FEES**Fee Description**

Each claim over 20 (including Reissues)

Each independent claim over 3 (including Reissues)

Multiple dependent claims

Fee (\$)	Small Entity Fee (\$)
50	25
200	100
360	180

Total Claims

23 -20 or HP =

Extra Claims

3

Fee (\$)
150.00**Fee Paid (\$)**
150.00**Multiple Dependent Claims****Fee (\$)****Fee Paid (\$)**

HP = highest number of total claims paid for, if great than 20

Indep. Claims

3 -3 or HP =

Extra Claims

0

Fee (\$)
0.00**Fee Paid (\$)**
0.00

HP = highest number of total claims paid for, if great than 3

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 USC 41(a)(1)(G) and 37 CFR 1.16(s)

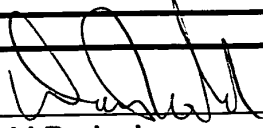
Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
23	-100 =	/50 = 0 (round up to a whole number) x	0.00 =	0.00

4. OTHER FEE(S)**Fee Paid (\$)**

Non-English Specification, \$130 fee (no small entity discount)

Other: Assignment

40.00

SUBMITTED BY		Complete (if applicable)	
Signature		Registration No. 47,034	Telephone Number 770-933-9500
Name: (Print/Type)	David Rodack	Date:	5-4-05

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) and application. Confidentiality is governed by 35 USC 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. Send to Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: **Webster et al.**

For: **Cyclic Diversity Systems and Methods**

CERTIFICATE OF EXPRESS MAIL

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P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

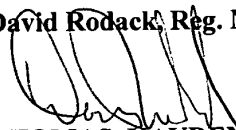
Enclosed for filing in the above case are the following documents:

Return Postcard
Utility Patent Application Transmittal Page
Fee Transmittal Page
Utility Patent Application Consisting of:
 17 Pages of Specification
 5 Pages of Claims (Claims 1-23)
 1 Page of Abstract
11 Pages of Formal Drawings (Fig(s). 1, 2, 3A-3B, 4A-4B, 5-6, 7A-7B
 and 8-10)
Assignment of Utility Patent Application (4 pages)
Assignment Recordation Cover Sheet (1 page)
Declaration for Patent Application (3 pages)
Information Disclosure Statement
Form PTO 1449
Cited Prior Art (5 References)
PTO-2038 authorizing payment in the amount of \$1,190.00 for utility
 application, 3 additional claims and assignment recordation fee

Further, the Commissioner is authorized to charge Deposit Account No. 20-0778 for any additional fees required. The Commissioner is requested to credit any excess fee paid to Deposit Account No. 20-0778.

Respectfully submitted,

David Rodack, Reg. No. 47,034



**THOMAS, KAYDEN, HORSTEMEYER
& RISLEY, L.L.P.**
100 Galleria Parkway, N.W.
Suite 1750
Atlanta, Georgia 30339-5948

Our Docket No: **050337-1020**

I hereby certify that all correspondence listed above are being deposited for delivery to the above addressee, with the United States Postal Service "**EXPRESS MAIL POST OFFICE TO ADDRESSEE**" service under 37 CFR §1.10 on the date indicated below:

The envelope has been given U.S. Postal Service "Express Mail Post Office To Addressee" Package # **EV558411326US**.

Date: May 4, 2005

Marianne Boland
Marianne Boland

CYCLIC DIVERSITY SYSTEMS AND METHODS

Inventors

MARK A. WEBSTER

MICHAEL J. SEALS

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of copending U.S. provisional application having serial no. 60/572,481, filed May 20, 2004, which is entirely incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention.

[0002] The present disclosure is generally related to communication systems, and, more particularly, is related to wireless communication systems and methods.

2. Related Art.

[0003] Wireless communication systems are widely deployed to provide various types of communication, such as voice, data, and so on. These systems may be based on code division multiple access (CDMA), time division multiple access (TDMA), orthogonal frequency division multiplex (OFDM), or some other multiplexing techniques. Continual demand for increased data rates has resulted in the advancement of communications system technology, such as the use of multiple antennas in a single device having transmitter and/or receiver functionality. However, in systems utilizing multiple-antenna

devices, there is a need to consider legacy receivers (*e.g.*, single-input, single output (SISO), OFDM receivers) and the design challenges concomitant with implementing transmitters with multiple antennas in an environment that still uses legacy receivers.

[0004] FIG. 1 is a block diagram that illustrates such a mixed antenna transmitter device/legacy environment. As shown, an 802.11 compliant (*e.g.*, 802.11a, 802.11g) multi-antenna (MA) transmitter device 102 is shown in communication with a SISO 802.11 receiver device 112 (herein simply SISO receiver device 112). The MA transmitter device 102 comprises antennas 104 and 106. The SISO receiver device 112 comprises an antenna 110. The same signals transmitted from antennas 104 and 106 may follow direct paths and multi-paths to antenna 110. Normally, multiple-path signals (*e.g.*, resulting from reflections off of objects in the environment or from multiple antennas) can result in either partial or complete constructive interference or destructive interference of the same signals in a SISO receiver. One mechanism to avoid or mitigate completely destructive interference from multi-path signals is to equip one of the antennas 104 and 106 with a time delay element 108 (or provide a delay through a baseband processing section of the MA transmitter device 102). From the perspective of the SISO receiver device 112, the time delay element 108 appears to cause the signal sent from antenna 106 to reach antenna 110 later than the same signal sent from antenna 104. This technique is often referred to as linear delay diversity, and its impact on performance of the SISO receiver device 112 is described below.

[0005] FIG. 2 is block diagram that describes an exemplary OFDM packet structure 200 used in the transmission of information between the MA transmitter device 102 (FIG. 1) and the SISO receiver device 112 (FIG. 1). Additional information about the packet structure can be found in 802.11 standards. The packet structure 200 is generated in a

baseband processing section (*e.g.*, in or in cooperation with an inverse fast Fourier transform (IFFT) operation) of the MA transmitter device 102, and comprises several sections. Sections A and B are comprised of short training symbols (STS). Section A is used by a communication system to provide signal detection, automatic gain control (AGC), and diversity selection functionality. Section B is used by a communication system to provide coarse frequency offset estimation and timing synchronization. Section C, sometimes referred to as a long training symbol (LTS), is used by a communication system to provide channel and fine frequency offset estimation. Section D is referred to as the signal field or header, and contains data rate and packet length information. Sections E and F are OFDM symbols. Sections D, E, and F provide rate length, service and data, and data, respectively. Section F is used as an exemplary OFDM symbol for the discussion below, and will be referred to as an OFDM symbol 300.

[0006] FIG. 3A is a block diagram that illustrates exemplary OFDM symbols 300a, 300b, and 300c (herein, simply referenced as OFDM symbol 300) shown in a time-domain perspective. Each OFDM symbol 300 comprises a guard interval (GI) 302, which provides a buffer between symbols 300. That is, multipath is equivalent to echoes, and the guard intervals 302 comprise a zone built into an OFDM symbol 300 into which echoes from a preceding OFDM symbol are positioned. Such echoes cause inter-symbol interference. The guard intervals 302 are inserted in the OFDM symbol 300 in the baseband processor portion of the MA transmitter device 102 (FIG. 1), and are used to capture unwanted multipath-induced inter-symbol interference at the SISO receiver device 112 (FIG. 1). In an 802.11 implementation, each symbol 300 is approximately 4 microseconds (μsec) in duration. For instance, of the 80 samples in an OFDM symbol waveform, the guard interval 302 consumes 16 samples (the data portion comprising 64-

samples). Fast Fourier transforms (FFT) applied at the SISO receiver device 112 (e.g., 64-point FFT) occur (or are placed) in the 3.2 (μ sec) interval of each OFDM symbol 300. That is, the SISO receiver device 112 discards the 0.8 μ sec duration guard interval 302 on each received 4 μ sec OFDM symbol, leaving 3.2 μ sec of signal (which comprises all of the information of the OFDM symbol) to FFT. No echoes are included in the 3.2 μ sec interval (inter-symbol interference free). Thus, reference to “placing” or “to place” or “placement” of the FFT is understood to comprise a process or method of extracting the correct 3.2 μ sec from each 4 μ sec interval for implementing the FFT.

[0007] FIG. 3B is a sub-carrier level view of the OFDM symbol 300 of FIG. 3A shown in a frequency domain perspective, and is helpful to consider in understanding how the guard intervals 302 (FIG. 3A) are created. An OFDM symbol 300 comprises a plurality of frequency subcarriers or tones 304 (e.g., 52 data subcarriers in an 802.11a or 802.11g OFDM symbol, although only a portion of the 52 are shown) distributed in both frequency directions from a center or direct current (DC) frequency. The subcarriers or tones 304 spin at progressively increasing rotations in an in-phase (I)/quadrature (Q) plane from center frequency. Assuming no guard interval insertion, the subcarrier located at frequency position 306 spins counter-clockwise (e.g., in a direction of increasing positive angles off of the x-axis) in an I/Q plane one cycle over one-64 sample period of the symbol 300. The subcarrier located at frequency position 308 spins clockwise (e.g., in a direction of negative angles off of the x-axis) in an I/Q plane one cycle over the 64 samples. The subcarrier located at frequency position 310 spins counter-clockwise two cycles over the 64 samples, and the subcarrier located at frequency position 312 spins clockwise two cycles over the 64 samples, and so on. Thus, with the guard intervals left out, what remains is a continuous waveform that repeats itself every 64-samples. The

guard intervals 302 are a time domain extension of the subcarriers 64 time samples, pre-spinning an additional 16 time domain samples. That is, subcarrier time samples are allowed to “pre-spin” out 16 samples, resulting in guard intervals being created as cyclic extensions of the spin of the subcarrier time samples. Thus, each subcarrier is allowed to spin approximately 25% more than the subcarrier spin without the guard intervals 302.

[0008] In light of the aforementioned background, and with continued reference to FIGS. 1-3B, consider how linear delay diversity impacts the symbol stream at the MA transmitter device 102 and the SISO receiver device 112. FIG. 4A is a block diagram that shows partial packet structures 200a and 200b, each having three symbols 300 (designated as symbol 1, symbol 2, and symbol 3) comprising guard intervals 302. Packet structure 200b is a delayed version of packet structure 200a. Packet structure 200b is delayed (*e.g.*, by delay element 108) a time delay duration designated as t_D .

[0009] With continued reference to FIGS. 1-4A, FIG. 4B is a block diagram that illustrates how the SISO receiver device 112 handles the received packet structures 200a and 200b shown in FIG. 4A. That is, FIG. 4B illustrates a single received signal (comprising the addition of the two transmit signals corresponding to packet structures 200a and 200b) output from the single receive antenna 110. The SISO receiver device 112 determines the guard interval and symbol location (and FFT placement) through an acquisition process that includes a correlation of the known pattern corresponding to the LTS (*e.g.*, section C of the OFDM packet 200 (FIG. 2)). Legacy receivers may perform a channel impulse response (CIR) estimate using the LTS. The LTS is designed to elicit an impulse response when correlated with multi-path, thus resulting in a multi-path profile. In the absence of a time delay (or in the absence of multi-path), the response to a received packet is an impulsive correlation (which would be

shown as a single impulse 402a in the guard interval 302), enabling proper timing or synchronization of the received signal and proper placement of the FFT. With the time delay (t_D) (or with multi-path), two impulsive responses (402a and 402b) are detected. The FFT is placed after the detection of the second impulse response 402b. Thus, FFT placement is accomplished by using the impulse response(s) to center the guard interval 302 on the transients so that inter-symbol interference ISI is minimized.

[0010] Linear delay diversity results in true delays that exhibits a behavior from a receiver perspective that is indistinguishable from true multi-path (*e.g.*, the situation where the signal bounces off an object and arrives at the SISO receiver device 112 with a time delay due to the greater path distance traveled). Further, with linear delay diversity, complete destructive interference is avoided, but at the expense of the consumption of the guard intervals 302.

[0011] Another technique used to make MA transmitters compatible with legacy receiver devices is referred to as cyclic delay diversity. With cyclic delay diversity, each tone or subcarrier is cyclically shifted (*e.g.*, in the baseband processing portion of the MA transmitter device 102, FIG 1) by a defined amount of samples, resulting in a circular shift of all of the samples involved (*e.g.*, 64 samples plus 16 samples of the data and guard interval, respectively). FIG. 5 is a schematic diagram that illustrates 1-sample cyclic delay diversity. The first tier 502 represents 80 total samples comprising 64 samples of symbol data 508 and 16 samples that are used for a guard interval 510. The second tier 504 is simply an extension of the first tier, showing the guard interval 510 corresponding to samples 510 adjacent to the next set of samples. This next set of samples comprises 64 samples of symbol data 512 and 16 samples corresponding to the guard interval 514a. The third tier 506 represents a 1-sample cyclic delay shift. As

shown, a delay of 1 sample results in the guard interval 514b preceding the 80 sample symbol in the third tier 506, starting with sample 4/7, as indicated by line 516. All of the other samples are likewise shifted as represented by the dotted arrow-head lines 518.

[0012] From a receiver standpoint, the guard intervals 510, 514b remain aligned, as represented by the dashed line 520. In other words, with cyclic delay diversity, guard intervals are not consumed as they are in linear delay diversity. The samples used for each guard interval are different after a cyclic shift, but the guard intervals still remain as 16 samples. However, one problem with cyclic delay diversity involves the acquisition process described earlier. When correlation occurs at the SISO receiver device 112 (FIG. 1), the sample shifting is detected, such shifting being indistinguishable from the sample shifting that occurs in linear delay diversity. In other words, the impulse response appears to shift directly with the cyclic shift. However, the true location of the guard interval does not change because the MA transmitter device 102 (FIG. 1) is using cyclic shifts. This can spoof the SISO receiver device 112 such that the FFT placement is erroneous. That is, the SISO receiver device 112 may shift the FFT over in a manner that spills over to the subsequent guard interval.

SUMMARY

[0013] Embodiments of cyclic diversity systems and methods are disclosed. One system embodiment, among others, comprises a logic configured to cyclically advance, or the periodic equivalent, one or more sections of an orthogonal frequency division multiplexing (OFDM) packet relative to the OFDM packet to be transmitted on a first transmit antenna, the packet having the one or more cyclically advanced sections to be

transmitted on a second transmit antenna, the duration of the cyclic advance having a duration less than a guard interval.

[0014] One method embodiment, among others, comprises providing an orthogonal frequency division multiplexing (OFDM) packet corresponding to a first transmit antenna, and cyclically advancing, or the periodic equivalent, one or more sections of the OFDM packet corresponding to a second transmit antenna, the duration of the cyclic advance having a duration less than a guard interval.

[0015] Other systems, methods, features, and advantages of the disclosed systems and methods will be or become apparent to one with skill in the art upon examination of the following drawings and detailed description. It is intended that all such additional systems, methods, features, and advantages be included within this description and be within the scope of the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Many aspects of the disclosure can be better understood with reference to the following drawings. The components in the drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the disclosed systems and methods. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

[0017] FIG. 1 is a block diagram that illustrates a communication system comprising a multiple-antenna (MA) transmitter device and a single-input, single-output (SISO) receiver device.

[0018] FIG. 2 is block diagram that describes an exemplary OFDM packet structure used in the communication system shown in FIG. 1.

- [0019] FIGS. 3A-3B are block diagrams that illustrates exemplary OFDM symbol structures.
- [0020] FIGS. 4A-4B are block diagrams that illustrate the processing of packet structures in the context of linear delay diversity.
- [0021] FIG. 5 is a schematic diagram that illustrates 1-sample cyclic delay diversity.
- [0022] FIG. 6 is block diagram that illustrates a communication system comprising an embodiment of an enhanced, multiple-antenna (EMA) transmitter device and a SISO transmitter device.
- [0023] FIGS. 7A-7B are schematic diagrams that illustrate two frequency selective spectrums that vary based on the amount of delay or advancement used.
- [0024] FIG. 8 is a schematic diagram that illustrates cyclic advance diversity as implemented by the communication system shown in FIG. 6.
- [0025] FIG. 9 is a plot that illustrates packet error performance of cyclic advance diversity compared to cyclic delay diversity.
- [0026] FIG. 10 is a flow diagram of one embodiment of a cyclic diversity method.

DETAILED DESCRIPTION

- [0027] Disclosed herein are various embodiments of cyclic diversity systems and methods, herein cyclic diversity systems. In one embodiment, a cyclic diversity system comprises a multiple-antenna, 802.11 compliant (*e.g.*, 802.11a, 802.11g, proposed 802.11n) transmitter device configured with cyclic extension logic that provides cyclic advance diversity, among other diversity (*e.g.*, cyclic delay, linear delay, *etc.*) to one or more sections of orthogonal frequency division multiplexing (OFDM) packet structures or OFDM continuous data streams (herein packet(s) or continuous data

stream(s) may each be referred to as a segment or segments). That is, cyclic diversity can be applied to one or more of the sections (*e.g.*, long training symbols, short training symbols, OFDM symbols, *etc.*) or periodic structures of a segment (*e.g.*, packet or continuous data stream) in the time domain (or the subcarrier structures in the frequency domain). By providing cyclic advances, cyclic shift diversity is employed which enables legacy receivers to experience improved packet error rate performance when compared to conventional diversity mechanisms, among other benefits.

[0028] FIG. 6 is block diagram that illustrates a communication system 600 comprising an embodiment of an enhanced, multiple-antenna (EMA) transmitter device and a single-input, single-output (SISO) receiver device. In particular, the communication system 600 comprises an EMA transmitter device 602 and a legacy receiver device 112, the legacy receiver device 112 described in association with FIG. 1. The EMA transmitter device 602 may be implemented using individual SISO transmissions (*e.g.*, one spatial stream per antenna) or using multiple-input, multiple-output (MIMO) technology that enables simultaneous or substantially simultaneous transmission over two or more spatial streams in the same spectrum. In other words, cyclic diversity may be applied to MIMO one spatial stream preambles, headers, and data symbols as well as to one or more sections of SISO transmission packets. The EMA transmitter device 602, or one or more components of the EMA transmitter device 602 may also be referred to as a cyclic diversity system. In some embodiments, a cyclic diversity system may comprise one or more components of a receiver device. In one embodiment, the EMA transmitter device 602 is compliant with 802.11 standards (*e.g.*, proposed 802.11n), and comprises modules 604 and 606. The EMA transmitter device 602 and/or the SISO receiver device 112 may each be embodied in any wireless (*e.g.*, radio frequency) communication

device, including computers (desktop, portable, laptop, *etc.*), consumer electronic devices (*e.g.*, multi-media players), compatible telecommunication devices, personal digital assistants (PDAs), or any other type of network devices, such as printers, fax machines, scanners, hubs, switches, routers, set-top boxes, televisions with communication capability, *etc.*

[0029] Module 604 comprises a transmit (TX) processor 608, which includes baseband processing modules (*i.e.*, logic, such as hardware and/or software) that comprise functionality for encoding, interleaving, mapping, and OFDM symbol generation and processing. In one embodiment, as part of the symbol generation and processing functionality, the transmit processor 608 comprises a cyclic extension module 622 that provides for cyclic extension (*e.g.*, guard intervals) insertion and cyclic advance diversity. In some embodiments, cyclic extension insertion may be implemented by a different module. Further, the cyclic extension module 622 may provide for delay diversity (cyclic and/or linear). The delay and/or cyclic advance may be a configurable and switchable function. For instance, the cyclic delay and/or advance functionality may be switched off or disabled (*e.g.*, through processing functionality in the transmit processor 608) when transmission delay is not implemented on the corresponding antenna 612. Further, the transmit processor 608 may deliver a cyclic advance in some transmissions, and switch the functionality to deliver a cyclic (or linear) delay. Module 604 further comprises radio circuitry 610 in communication with the transmit processor 608 and an antenna 612.

[0030] Module 606 comprises similar components and functionality to module 604, including a transmit processor 614, radio circuitry 618, and antenna 620. Transmit processor 614 further comprises a cyclic extension module 616, that operates in similar

manner to cyclic extension module 622, and thus the discussion of the same and other like components of module 606 is omitted for brevity.

[0031] Note that in some embodiments, the communication system 600 may comprise multiple-antenna receiver devices mixed with SISO receiver devices. Also, in some embodiments, transmitter functionality may be included in one or more receiver devices of the communication system 600 and/or receiver functionality may be included in one or more transmitter devices of the communication system 600.

[0032] In operation, transmit processors 608 and 614 encode and interleave the incoming data (designated TX data1 at TX data rate1 at module 604, which is also provided to module 606 as represented by connection 630). Transmit processors 608 and 614 map the interleaved data into respective sub-carrier channels as frequency domain symbols. Inverse fast Fourier transform (IFFT) logic in baseband processing circuitry of the transmit processors 608 and 614 performs an inverse fast Fourier transformation on the frequency domain symbols to create OFDM symbols.

[0033] Cyclic extension modules 616 or 622 provide for cyclic extension insertion and/or advance diversity (and delay diversity in some embodiments). In one embodiment, the cyclic advance is approximately 100 nano-seconds (nsec). The choice of duration for the advance depends on several considerations. FIGS. 7A-7B are schematic diagrams that illustrate two frequency selective spectrums 700a and 700b, respectively, that vary based on the amount of delay or advancement used. When providing advance or delay diversity, intentional multi-path is created, which in turn creates frequency selective fading. With reference to FIG. 7A, introducing one sample delay or advance introduces a “notch” 702 in the waveform, with a location of that notch 702 depending at least in part on phase of

the second (delayed) signal. If the notch falls in the center, a significant portion of the signal waveform is eliminated.

[0034] With reference to FIG. 7B, introducing a two-sample delay or advance introduces notches 704 and 706 in two locations. By using a two-sample delay or advance, although more notches are introduced, the center portion of the signal waveform (50% of the signal waveform) is “flattened” out, thus preserving a significant portion of the waveform.

[0035] In some embodiments, additional cyclic extension modules corresponding to additional antennas may be used, and a variation of delays and advances may be implemented. For instance, and with continued reference to FIG. 6, antenna 612 may transmit with no delay or advance, antenna 620 may transmit with an advance, a third antenna may transmit with a delay, and a fourth antenna may transmit with an advance. Additional functionality, such as digital-to-analog (D/A) functionality, may also be included in the transmit processors 608 and 614, as would be understood by one having ordinary skill in the art.

[0036] With reference to FIG. 6, the transmit processors 608 and 614 provide the processed data to radio circuitry 610 and 618, which provides such well-known functions as filtering, modulation, amplification, and conversion (*e.g.*, upconversion) functionality. The radio circuitry 610 and 618 provide the processed signals (*e.g.*, no advance and no delay, and advanced, respectively) to antennas 612 and 620, from which the transmitted signals are delivered to SISO receiver device 112.

[0037] The signals transmitted from antennas 612 and 620 are received at antenna 110 of SISO receiver device 112, demodulated and converted to baseband, and processed to recover the transmitted data.

[0038] FIG. 8 is a schematic diagram that illustrates 4-sample cyclic advance diversity as implemented by the communication system 600 shown in FIG. 6. The first tier 802 represents 80 total samples comprising 64 samples of symbol data 808 and 16 samples that are used for a guard interval 810. The second tier 804 is simply an extension of the first tier 802, showing the guard interval corresponding to samples 810 adjacent to the next set of samples. This next set of samples comprises 64 samples of symbol data 812 and 16 samples corresponding to the guard interval 814a. The third tier 806 represents a 4-sample cyclic advance shift. As shown, an advance shift of 4 samples results in the guard interval 814b preceding the 80 sample symbol in the third tier 806 starting with sample 5/2, as represented by line 816. All of the other samples are likewise shifted as represented by the dotted arrow-head lines 818.

[0039] From a receiver standpoint, the guard intervals 810, 814b remain aligned, as represented by the dashed line 820. In other words, with cyclic advance diversity, and similar to cyclic delay diversity, guard intervals are not consumed as they are in linear delay diversity. However, unlike cyclic delay diversity, cyclic advance diversity does not result in net shifting of the FFT. That is, the FFT placement remains substantially centered and unshifted. One reason for this phenomenon is that the cyclic shifts created by the cyclic extension modules 616 and 622 (FIG. 6) provide a shift that is in a direction opposite to any FFT shift that occurs in response to multi-path created by the multiple antennas and reflections.

[0040] As is shown below, small cyclic advances are preferred over small cyclic delays, since the SISO receiver 112 (FIG. 1) handles small amounts of delays or advances because they are designed in the context of expected multipath. That is, the SISO receiver device 112 is designed to handle a multi-path spread (*e.g.*, defined as the time spread

from a first multipath ray arrival and a last multipath arrival at the SISO receiver device 112) of up to approximately 200 nsec. For instance, an 802.11 compliant WLAN transmitter device may transmit a packet with a guard interval having a duration of approximately 800 nsec. The guard interval, as described above, is designed to catch multipath. Shifts should look like multipath to a legacy receiver device, and thus are preferably less in duration than the duration of the guard interval. Due to the periodic nature of OFDM subcarriers, mathematically, a small cyclic advance of 100 nsec is identical or equivalent to a large delay of 3100 nsecs (the OFDM symbol waveform repeats with a period of 3.2 μ sec or 3200 nsec). In other words, 3100 nsec is a periodic equivalent to 100 nsec. Likewise, a small delay of 100 nsec is identical to an advance of 3100 nsec, again due to the periodic nature of the OFDM symbol 300 (*e.g.*, FIG. 3). Thus, a signal received by the SISO receiver device 112 (FIG. 6) having a cyclic advance of 100 nsec or a signal having a cyclic delay of 3100 nsec is processed as an identical signal from the perspective of the SISO receiver device 112, since the EMA transmitter device 602 (FIG. 6) transmits the identical signal in each case. Since a circular shift is indeed circular, the FFT placement is at the same position shifting in either direction (100nsec advance, 3100 nsec delay). What has been determined experimentally is that small cyclic advances are superior to small cyclic delays.

[0041] Experimental testing has shown that legacy radios show significant performance gains in packet error rate with small advancements (*e.g.*, 100 nsec) as opposed to large delays (*e.g.*, that span an almost an entire FFT). FIG. 9 is a plot that illustrates packet error performance of cyclic advance diversity compared to cyclic delay diversity. In particular, FIG. 9 shows a plot 900 of the packet error performance (PER) on the y-axis 902 (0.1 corresponds to 10% PER), and the x-axis 904 is the E_b/N_0 ratio in

decibels (dB), where E_b is the energy per information bit and N_0 is the (one-sided) noise power spectral density. The legend 906 shows numbers -2 through 0 and 2 through 4 . The numbers $2-4$ correspond to cyclic advance diversity of $2-4$ samples, respectively. Two (2) sample shifts is equal to 100 nsec, three (3) sample shifts are equal to 150 nsec, and four (4) samples shifts is equal to 200 nsec. The -1 and -2 are cyclic delays of 1 -sample (50 nsec) and 2 -samples (100 nsec), respectively. The 0 corresponds to a situation in which the second antenna had no delay relative to the first antenna, so signals were not separable by a SISO receiver device. The sample rate corresponding to the curves in this plot 900 was 20 MHz for an 802.11 OFDM. As shown in the plot 900 of FIG. 9, the lower the curve, the better the PER performance for a particular SNR. The cyclic advance diversity, such as shown in curves $2-4$ works well and indeed is generally superior in PER performance to cyclic delay diversity. Additional performance curves may be found in the provisional application referenced in the cross-reference to related applications section of this disclosure.

[0042] Embodiments of a cyclic extension system, comprised of one or more components of the EMA transmitter device 602 (FIG. 6) (*e.g.*, such as cyclic extension modules 616 and/or 622), can be implemented in hardware, software, firmware, or a combination thereof. If implemented in hardware, such embodiments can be implemented with any or a combination of the following technologies, which are all well known in the art: a discrete logic circuit(s) having logic gates for implementing logic functions upon data signals, an application specific integrated circuit (ASIC) having appropriate combinational logic gates, a programmable gate array(s) (PGA), a field programmable gate array (FPGA), *etc.*

[0043] Functionality of one or more components that comprise embodiments of a cyclic extension system may also be implemented in software or firmware that is stored in a memory and that is executed by a suitable instruction execution system.

[0044] In light of the above description, it will be appreciated that a cyclic diversity method embodiment 600a may be described by the flow diagram illustrated in FIG. 10. In particular, the method 600a comprises providing an orthogonal frequency division multiplexing (OFDM) packet corresponding to a first transmit antenna (1002) and cyclically advancing, or performing the periodic equivalent of the same, one or more sections of the OFDM packet corresponding to a second transmit antenna, the duration of the cyclic advance having a duration less than a guard interval.

[0045] Any process descriptions or blocks in flow charts should be understood as representing modules, segments, or portions of code which include one or more executable instructions for implementing specific logical functions in the process, and alternate implementations are included within the scope of the embodiments in which functions may be executed out of order from that shown or discussed, including substantially concurrently or in reverse order, depending on the functionality involved, as would be understood by those reasonably skilled in the art.

[0046] It should be emphasized that the above-described embodiments of the disclosure, particularly, any “preferred” embodiments, are merely possible examples of implementations, merely set forth for a clear understanding of the principles of the disclosed systems and methods. Many variations and modifications may be made to the above-described embodiment(s) without departing substantially from the scope of the disclosure. All such modifications and variations are intended to be included herein within the scope of this disclosure s.

CLAIMS

What is claimed:

- 1 1. A cyclic diversity method, comprising:
2 providing an orthogonal frequency division multiplexing (OFDM) packet
3 corresponding to a first transmit antenna; and
4 cyclically advancing, or performing the periodic equivalent of the same, one or
5 more sections of the OFDM packet corresponding to a second transmit antenna, the
6 duration of the cyclic advance having a duration less than a guard interval.
- 1 2. The method of claim 1, wherein cyclically advancing comprises cyclically
2 advancing a duration of less than approximately 800 nanoseconds.
- 1 3. The method of claim 1, further comprising transmitting the OFDM packet
2 corresponding to the first transmit antenna from the first transmit antenna and transmitting
3 the OFDM packet having the one or more cyclically advanced sections from the second
4 transmit antenna.
- 1 4. The method of claim 1, further comprising transmitting the OFDM packet
2 corresponding to the first transmit antenna with cyclic delay, cyclic advance, or linear
3 time delay for the one or more sections of the OFDM packet from additional transmit
4 antennas.

1 5. The method of claim 1, further comprising determining whether to transmit the
2 OFDM packet corresponding to the first transmit antenna with a cyclic delay, cyclic
3 advance, or a linear time delay applied to the one or more sections of the OFDM packet
4 when transmission is to be from additional transmit antennas.

1 6. The method of claim 1, further comprising transmitting the OFDM packet
2 corresponding to the first transmit antenna and the OFDM packet having the one or more
3 cyclically advanced sections corresponding to the second transmit antenna from a
4 multiple-antenna transmitter device.

1 7. The method of claim 1, further comprising receiving the OFDM packet
2 corresponding to the first transmit antenna and the OFDM packet having the one or more
3 cyclically advanced sections corresponding to the second transmit antenna and placing a
4 fast Fourier Transform (FFT) in an interval corresponding to the duration of a recovered
5 OFDM symbol corresponding to one of the OFDM packets without shifting the FFT into
6 an adjacent OFDM symbol.

1 8. The method of claim 7, wherein receiving and placing comprises receiving at a
2 single-input, single-output (SISO) receiver device.

1 9. A cyclic diversity system, comprising:
2 a logic configured to cyclically advance, or perform the periodic equivalent of the
3 same, one or more sections of an orthogonal frequency division multiplexing (OFDM)
4 packet relative to the OFDM packet to be transmitted on a first transmit antenna, the
5 packet having the one or more cyclically advanced sections to be transmitted on a second
6 transmit antenna, the duration of the cyclic advance having a duration less than a guard
7 interval:

1 10. The system of claim 9, further comprising transmit logic configured to transmit
2 the OFDM packet and the OFDM packet having the one or more cyclically advanced
3 sections on the first transmit antenna and the second transmit antenna, respectively.

1 11. The system of claim 10, wherein the transmit logic is configured to transmit the
2 OFDM packet with a cyclic delay, cyclic advance, or linear time delay for the one or more
3 sections of the OFDM packet from additional transmit antennas.

1 12. The system of claim 9, wherein the logic is configured to cyclically advance the
2 one or more sections of the OFDM packet to be transmitted from the second transmit
3 antenna a duration of less than approximately 800 nanoseconds.

1 13. The system of claim 9, wherein the logic is configured to determine whether to
2 transmit the OFDM packet with a cyclic delay, cyclic advance, or a linear time delay
3 applied to the one or more sections of the OFDM packet.

1 14. The system of claim 9, wherein the system is embodied as a multiple-antenna
2 transmitter device.

1 15. The system of claim 9, further comprising receive logic configured to receive the
2 OFDM packet corresponding to the first transmit antenna and the OFDM packet having
3 the one or more cyclically advanced sections corresponding to the second transmit
4 antenna.

1 16. The system of claim 15, further comprising processing logic configured to place a
2 fast Fourier Transform (FFT) in an interval corresponding to the duration of an OFDM
3 symbol of one of the received OFDM packets without shifting the FFT into an adjacent
4 OFDM symbol.

1 17. The system of claim 16, wherein the receive logic and the processing logic is
2 located in a single-input, single-output (SISO) receiver device.

1 18. The system of claim 9, wherein the system comprises an 802.11 compliant device.

1 19. The system of claim 9, wherein the logic is configured in hardware, software, or a
2 combination of hardware and software.

1 20. The system of claim 9, wherein the logic is configured in digital circuitry, analog
2 circuitry, or a combination of digital and analog circuitry.

- 1 21. A cyclic diversity system, comprising:
2 means for providing an orthogonal frequency division multiplexing (OFDM)
3 segment corresponding to a first transmit antenna; and
4 means for cyclically advancing, or performing the periodic equivalent of the same,
5 one or more sections of the OFDM segment corresponding to a second transmit antenna,
6 the duration of the cyclic advance having a duration less than a guard interval.
- 1 22. The system of claim 21, wherein the segment comprises a continuous data stream.
- 1 23. The system of claim 21, wherein the segment comprises a packet.

ABSTRACT

[0047] Embodiments of cyclic diversity systems and methods are disclosed. One system embodiment, among others, comprises a logic configured to cyclically advance, or perform the periodic equivalent of the same, one or more sections of an orthogonal frequency division multiplexing (OFDM) packet relative to the OFDM packet to be transmitted on a first transmit antenna, the packet having the one or more cyclically advanced sections to be transmitted on a second transmit antenna, the duration of the cyclic advance having a duration less than a guard interval.

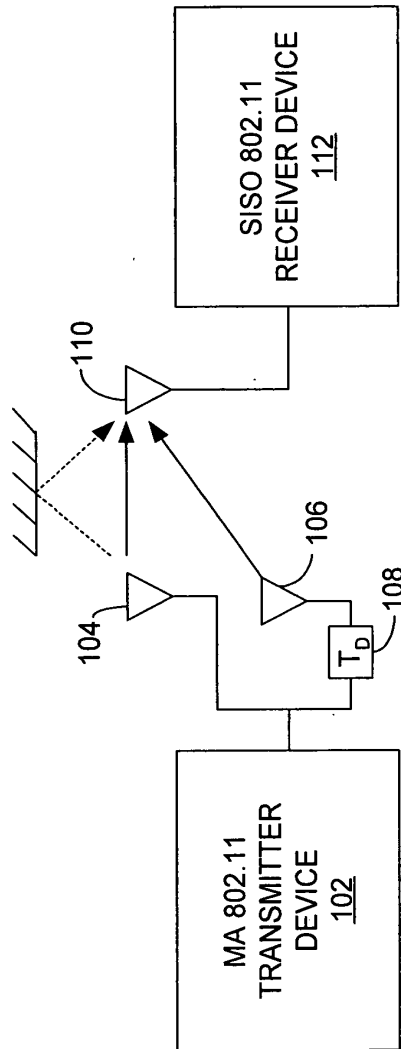


FIG. 1
(PRIOR ART)

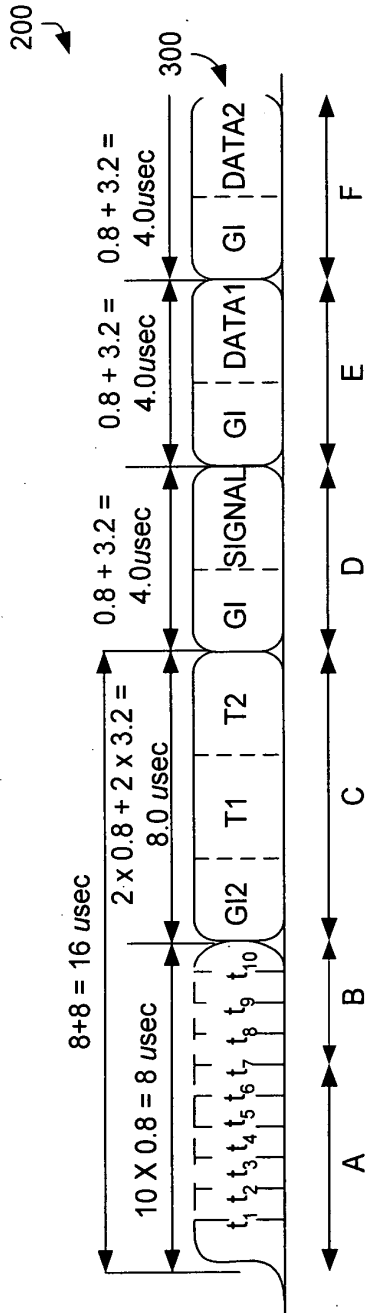


FIG. 2 (PRIOR ART)

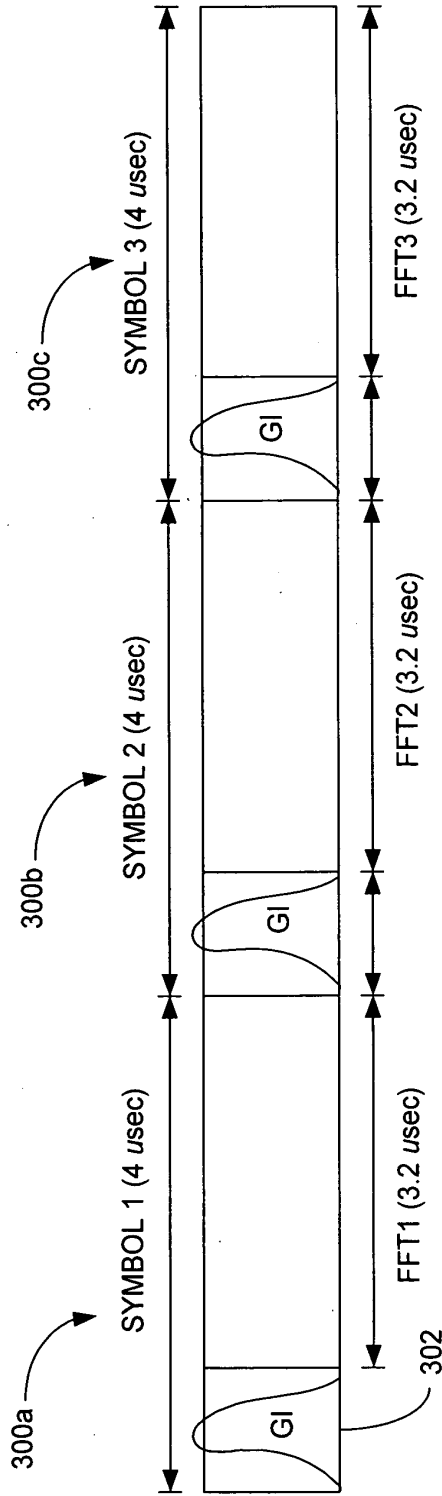


FIG. 3A (PRIOR ART)

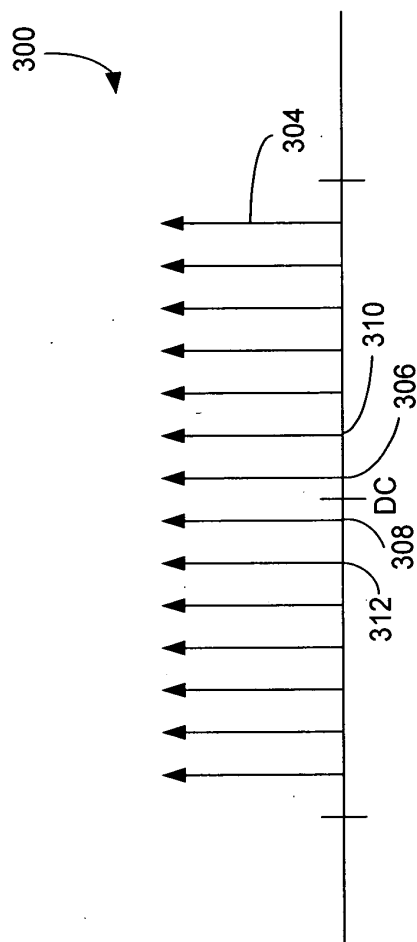


FIG. 3B (PRIOR ART)

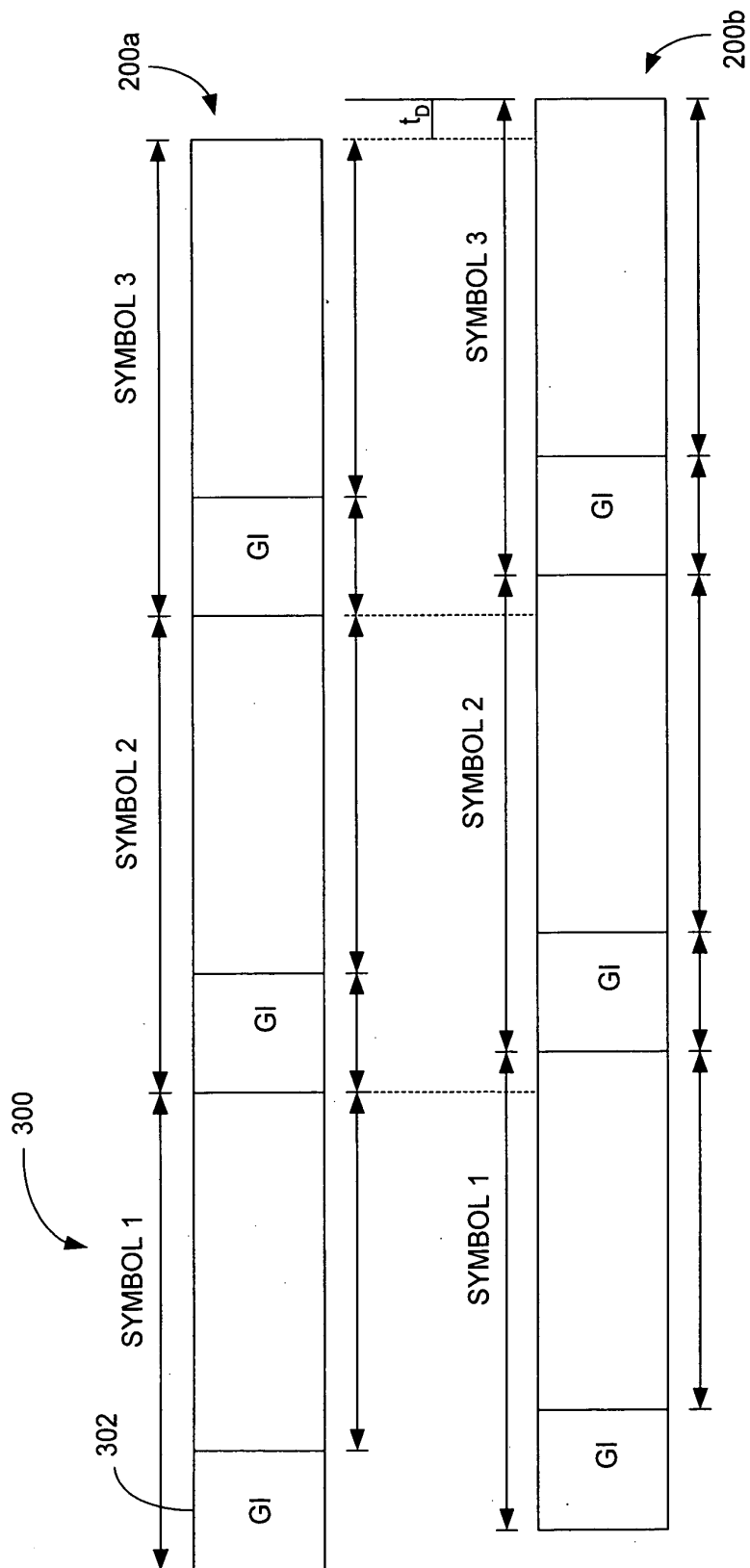


FIG. 4A (PRIOR ART)

200a, 200b

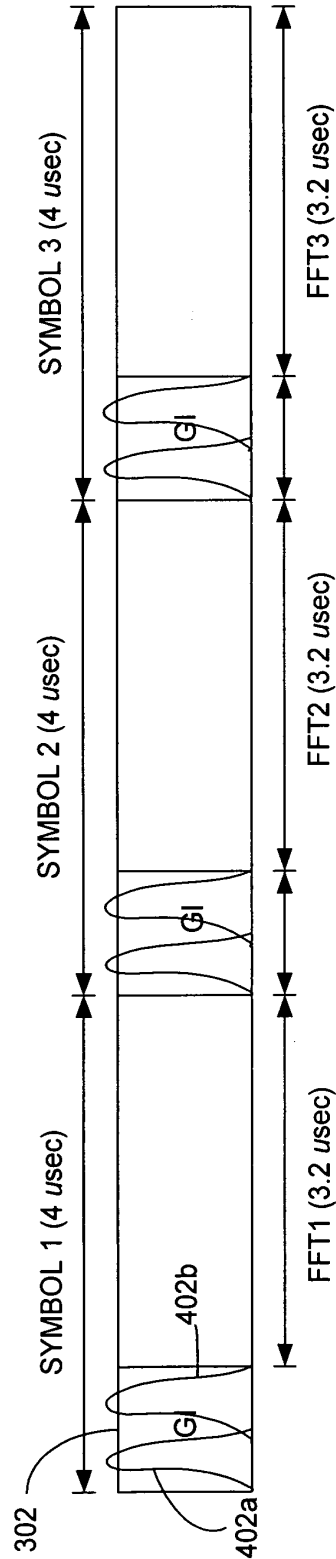


FIG. 4B (PRIOR ART)

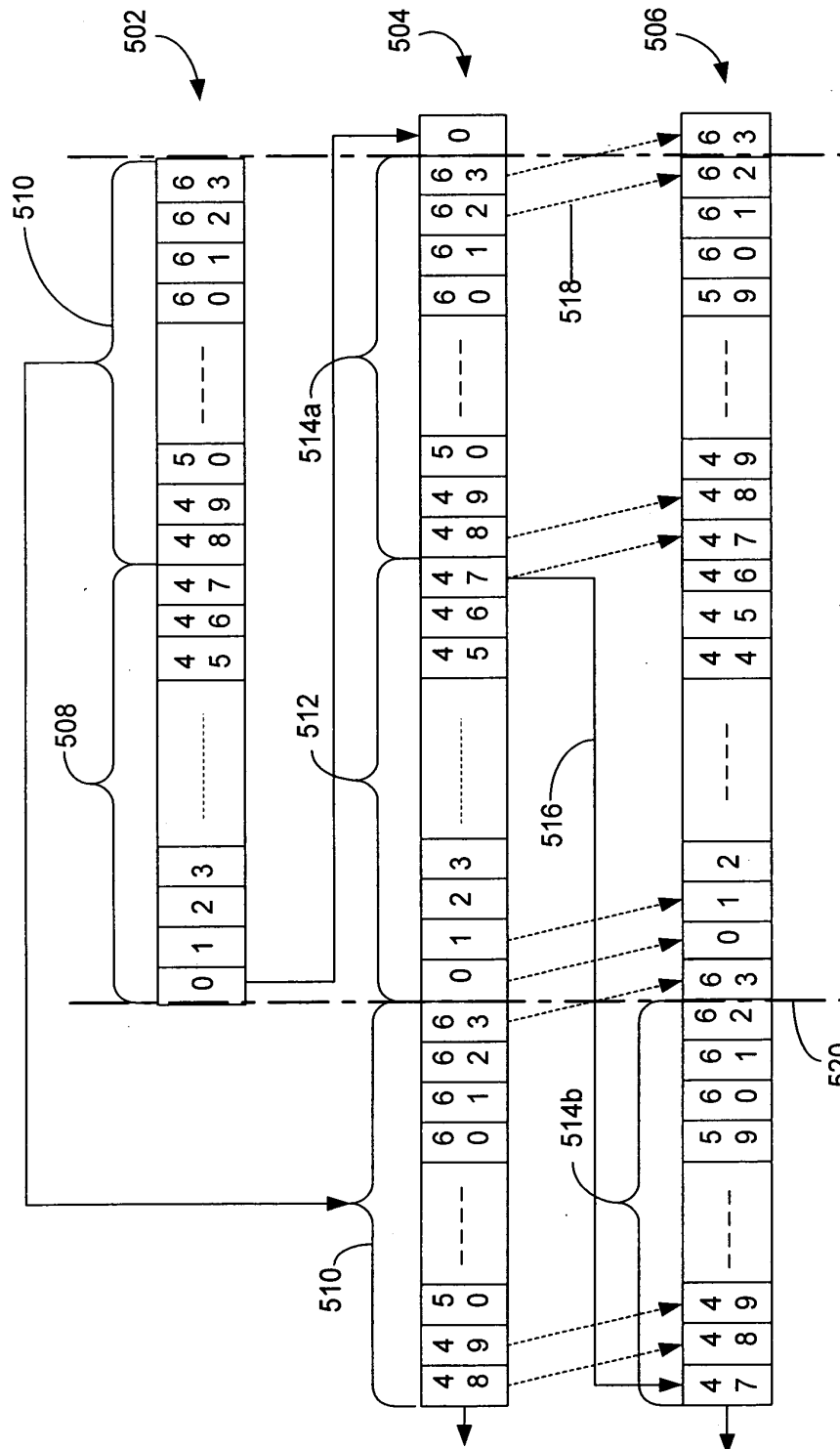


FIG. 5 (PRIOR ART)

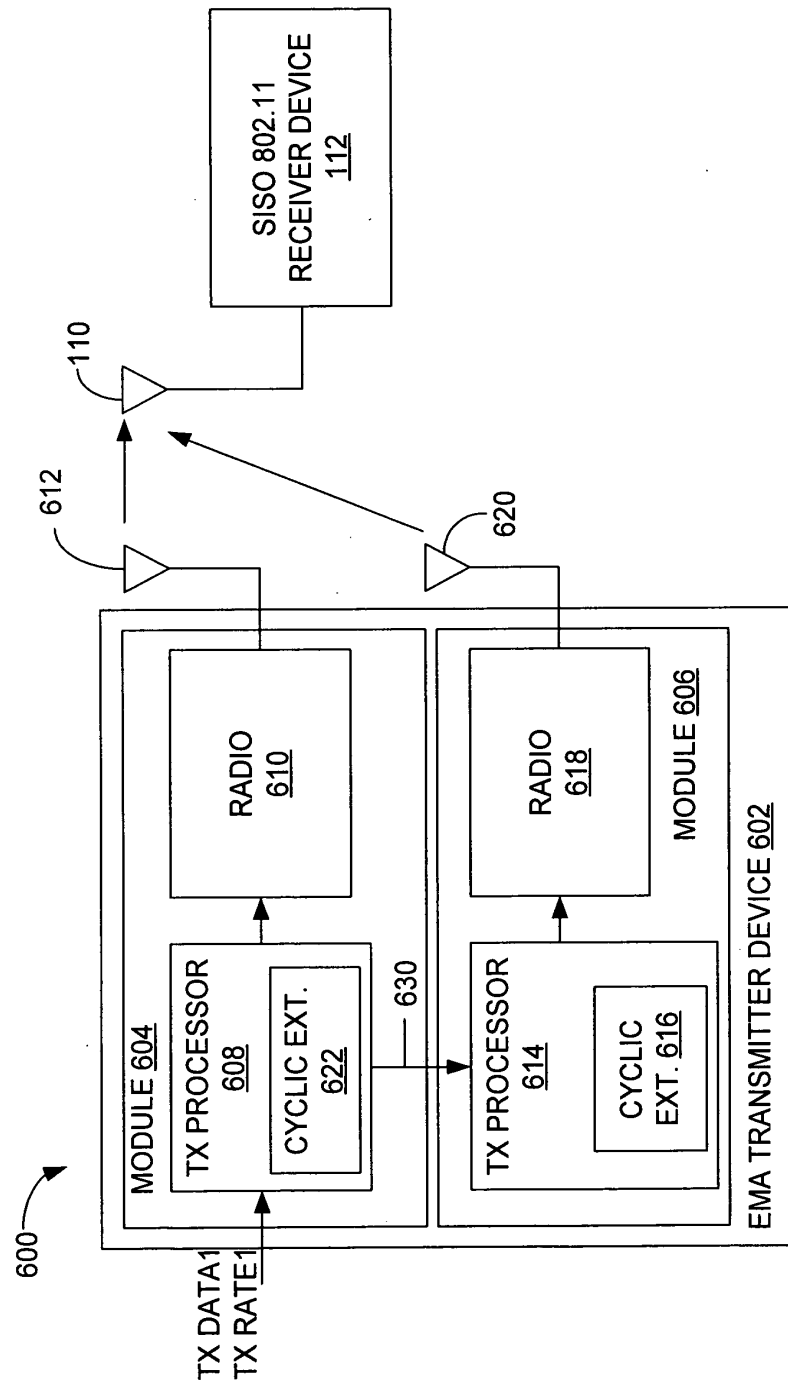


FIG. 6

FIG. 7A

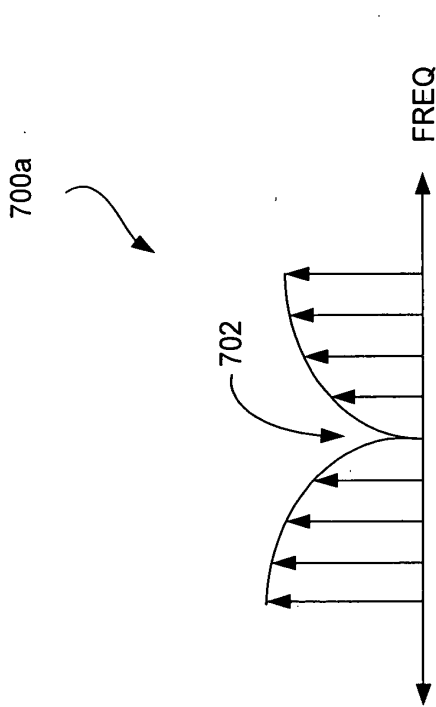
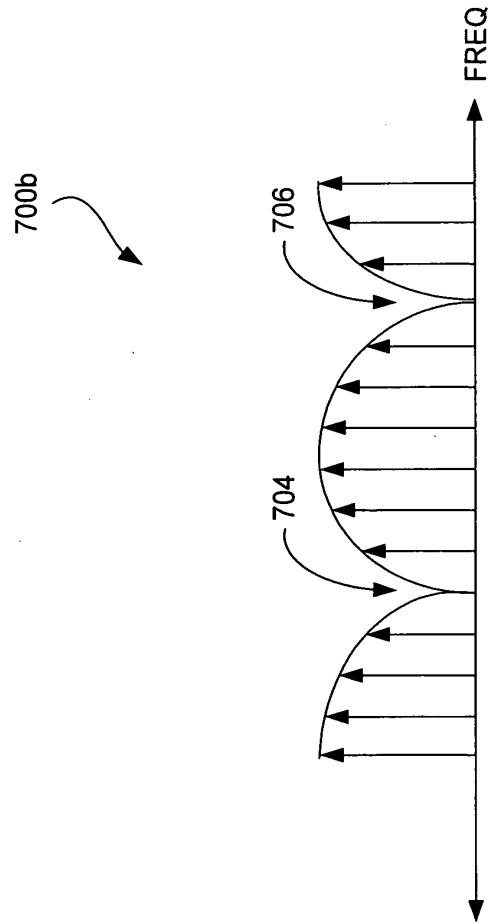


FIG. 7B





900

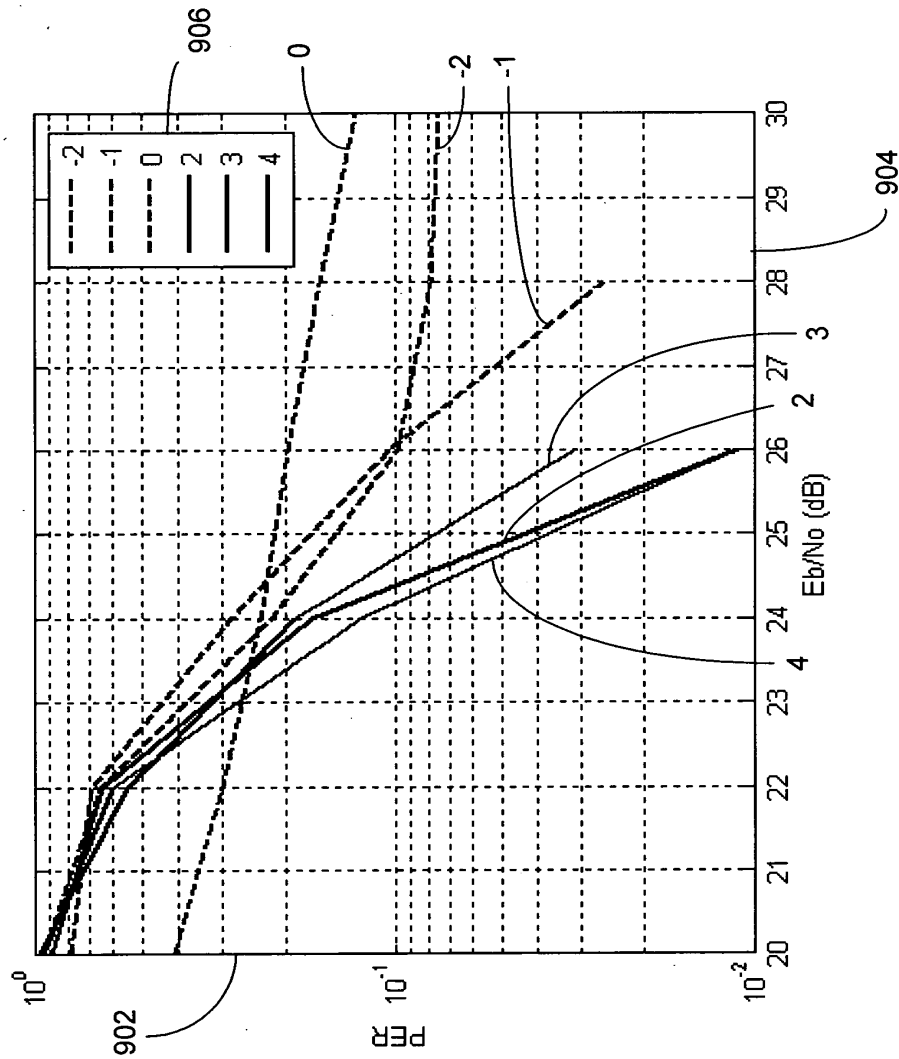


FIG. 9

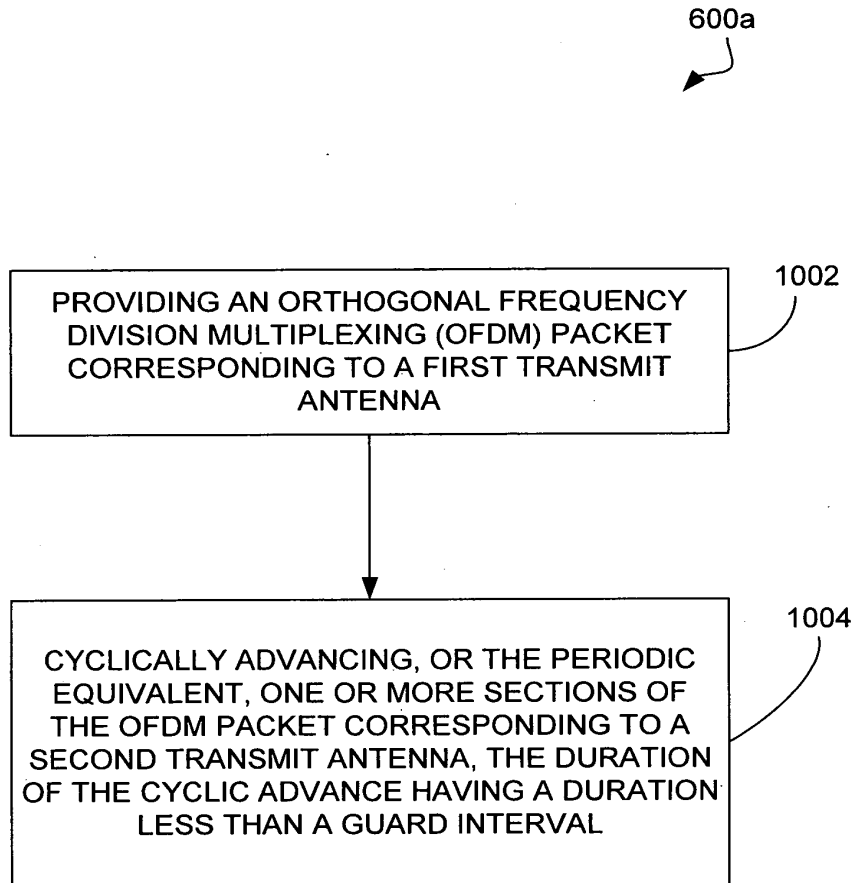


FIG. 10

DECLARATION FOR PATENT APPLICATION

Docket No: 050337-1020 /
04CXT0062WL

As the below named inventors, we hereby declare that:

Our residences, post office addresses and citizenships are as stated below next to our names.
We believe we are the original, first, and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled **CYCLIC DIVERSITY SYSTEMS AND METHODS**, the specification of which:

☒ is attached hereto.
☐ was filed on _____ as Application Serial No. _____.
☐ was filed on _____ under U.S. Express Mail No. _____.
☐ is set forth in PCT International Application No. _____;
filed on _____ and as amended Under PCT Article 19 on _____ (if any).

I/we hereby state that I/we have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I/we hereby claim foreign priority benefits under Title 35, United States Code, 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America listed below and have also identified below any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed: **NOT APPLICABLE.**

I/we hereby appoint all attorneys and agents of Thomas, Kayden, Horstemeyer & Risley, LLP, who are listed under the USPTO Customer Number shown below as my/our attorneys and agents to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith, recognizing that the specific attorneys and agents listed under that Customer Number may be changed from time to time at the sole discretion of Thomas, Kayden, Horstemeyer & Risley, LLP, and request that all correspondence be addressed to the address filed under the same USPTO Customer Number.

24504

and the following attorneys from Conexant Systems, Inc.

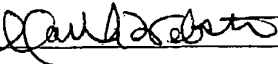
Semion Talpalatsky, Reg. No. 35,380; Joseph H. Lee, Reg. No. 37,664.

Please address all telephone calls, in the first instance, to **Scott A. Horstemeyer** at telephone number: **(770) 933-9500**. Address all correspondence to:

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& RISLEY, L.L.P.
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Atlanta, Georgia 30339-5948

Docket No. 050337-1020
04CXT0062WL
Page 2 of 3

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statement and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Inventor's Signature:  Date: May 2, 2005
Full Name of Second Inventor: Mark A. Webster
Residence: 139 Island View Drive, Indian Harbor Beach, FL 32937 Citizenship: USA
Post Office Address: Same as Residence.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statement and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Inventor's Signature: Michael J. Seals Date: May 2, 2005

Full Name First or Sole Inventor: Michael J. Seals
Residence: 3870 Shady Run Road, Melbourne, FL 32934 Citizenship: USA
Post Office Address: Same as Residence.

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

05/06/2005 HTECKLU1 00000029 11121661

01 FC:1011	300.00 OP
02 FC:1111	500.00 OP
03 FC:1311	200.00 OP
04 FC:1202	150.00 OP

PTO-1556
(5/87)

*U.S. Government Printing Office: 2002 — 489-297/60033

PATENT APPLICATION FEE DETERMINATION RECORD
Effective December 8, 2004

11121661

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	23	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	23 minus 20 = *	
INDEPENDENT CLAIMS	3 minus 3 = *	
MULTIPLE DEPENDENT CLAIM PRESENT ☐		

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐ OR

OTHER THAN SMALL ENTITY

RATE	FEE
BASIC FEE	150.00
X\$ 25=	
X100=	
+180=	
TOTAL	

RATE	FEE
BASIC FEE	300.00
X\$50=	150
X200=	
+360=	
TOTAL	450

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	* Minus **	=
	Independent	* Minus ***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐		

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
X\$ 25=	
X100=	
+180=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$50=	
X200=	
+360=	
TOTAL ADDIT. FEE	

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
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	Independent	* Minus ***	=
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RATE	ADDITIONAL FEE
X\$ 25=	
X100=	
+180=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$50=	
X200=	
+360=	
TOTAL ADDIT. FEE	

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
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	Independent	* Minus ***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐		

RATE	ADDITIONAL FEE
X\$ 25=	
X100=	
+180=	
TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE
X\$50=	
X200=	
+360=	
TOTAL ADDIT. FEE	

- * If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 - ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
 - *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
- The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Webster et al.

Confirmation No.: TBA

Group Art Unit: TBA

Serial No.: TBA

Examiner: TBA

Filed: May 4, 2005

Docket No.: 50337-1020

For: Cyclic Diversity Systems and Methods

INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, Virginia 22313-1450

Sir:

This information disclosure statement is filed in accordance with 37 C.F.R. §§ 1.56, 1.97, and 1.98, and specifically:

- ☒ under 37 CFR 1.97(b), or
 (within Three months of filing national application; or date of entry of international application; or before
 mailing date of first office action on the merits; whichever occurs last)
- ☐ under 37 CFR 1.97(c) together with either a:
☐ Statement Under 37 C.F.R. 1.97(e), or
☐ a \$180.00 fee under 37 CFR 1.17(p), or
 (After the CFR 1.97(b) time period, but before the final office action or notice of allowance, whichever
 occurs first)
- ☐ under 37 CFR 1.97(d) together with a:
☐ Statement under 37 CFR 1.97(e), and
☐ a \$180.00 petition fee set forth in 37 CFR 1.17(p).
 (Filed after final office action or notice of allowance, whichever occurs first, but before payment of the
 issue fee)

Enclosed is a check in the amount of \$

Enclosed is Credit Card Payment Form (PTO-2038) in the amount of \$

Please charge \$ to deposit account . At any time during the pendency of this application, please charge any
 fees required to Deposit Account pursuant to 37 CFR 1.25. The Commissioner is hereby requested to credit any
 overpayment to Deposit Account No.

- ☒ Applicant(s) submit herewith *Form PTO 1449A - Information Disclosure Statement by Applicant* together with copies
 (where required) of patents, publications or other information of which applicant(s) are aware, which applicant(s)
 believe(s) may or may not be material to the examination of this application and for which there may be a duty to disclose
 in accordance with 37 CFR 1.56. As required by 37 C.F.R. §1.98(a), a legible copy of each document is provided.

- ☐ A concise explanation of the relevance of foreign language patents, foreign language publications and
 other foreign language information listed on PTO Form 1449, as presently understood by the individual(s) designated in
 37 CFR 1.56(c) most knowledgeable about the content is given on the attached sheet, or where a foreign language patent
 is cited in a search report or other action by a foreign patent office in a counterpart foreign application, an English
 language version of the search report or action which indicates the degree of relevance found by the foreign office is listed
 on the form PTO 1449 and is enclosed herewith.

The following rights are reserved by the Applicant(s): the right to establish the patentability of the claimed invention over any of the listed documents should they be applied as reference, and/or the right to prove that some of these documents may not be prior art, and/or the right to prove that some of these documents may not be enabling for the teachings they purport to offer.

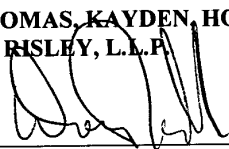
This statement should not be construed as a representation that an exhaustive search has been made, or that information more material to the examination of the present application does not exist. Any statements or identifications regarding the relevance of any portion(s) of cited references should not be construed as a representation that the most relevant portion(s) have been identified, and the absence of such statements or identifications should not be construed as representations that there are no relevant portion(s). The Examiner is specifically requested not to rely solely on the materials submitted herewith. The Examiner is requested to conduct an independent and thorough review of the documents, and to form independent opinions as to their significance.

It is requested that the information disclosed herein be made of record in this application and that the Examiner initial and return a copy of the enclosed PTO-1449 to indicate the documents have been considered.

Respectfully Submitted,

**THOMAS, KAYDEN, HORSTEMEYER
& RISLEY, L.L.P.**

By:



David Rodack; Reg. No. 47,034

100 Galleria Parkway, Suite 1750
Atlanta, Georgia 30339-5948
770-933-9500

Form PTO-1449 INFORMATION DISCLOSURE CITATION <i>(Use several sheets if necessary)</i>				Attorney Docket No. 50337-1020		Serial No. TBA	
				Applicant Webster, et al.			
				Filing Date May 4, 2005		Group TBA	
U.S. PATENT DOCUMENTS							
Examiner Initials	Item	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
FOREIGN PATENT DOCUMENTS							
		Document Number	Date	Country	Class	Subclass	Translation
						Yes No	
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)							
	A	IEEE Std 802®-2001, "802® IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture," IEEE Computer Society, March 8, 2002					
	B	Manoneet Singh, et al. and Bruce Edwards, et al., "WwiSE proposal: High throughput extension to the 802.11," IEEE 11-04-0886-00-000n, August 13, 2004.					
	C	Syed Aon Mujtaba, "TGn Sync Proposal Technical Specification," IEEE 802.11-04/889r0, August 13, 2004.					
	D	Aon Mujtaba, Adrian P. Stephens, Alek Purkovic, Andrew Myles, Brian Johnson, Daisuke Takeda, Darren McNamara, Dongjun (DJ) Lee, David Bagby, Eldad Perahia, Huanchun Ye, Hui-Ling Lou, James Chen, James Mike Wilson, Jan Boer, Jari Jokela, Jeff Gilbert, Joe Pitarressi, Jorg Habetha, John Sadowsky, Jon Rosdahl, Luke Qian, Mary Cramer, Masahiro Takagi, Monisha Ghosh, Nico van Waes, Osama Aboul-Magd, Paul Feinberg, Pen Li, Peter Loc, Pieter-Paul Giesberts, Richard van Leeuwen, Ronald Rietman, Seigo Nakao, Sheung Li, Stephen Shellhammer, Takushi Kunihiro, Teik-Kheong, Tomoko Adachi, Tomoya Yamaura, Tsuguhide Aoki, Won-Joon Choi, Xiaowen Wang, Yasuhiko Tanabe, Yasuhiro Tanaka, Yoshiharu Doi, Yichi Morioka, Youngsoo Kim, "TGn Sync Proposal," IEEE 802.11-04/888r0, August 13, 2004.					
	E	VK Jones, Neil Hamady, Jason Trachewsky, Michael Seals, Stephan ten Brink, George Vlantis, Sean Coffey, "WwiSE IEEE 802.11n Proposal," IEEE 802.11-04/0935r3, September 16, 2004.					
* EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.							
EXAMINER'S SIGNATURE:					DATE CONSIDERED:		

Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UTILITY PATENT APPLICATION TRANSMITTAL (Only for new nonprovisional applications under 37 CFR 1.53(b))	Attorney Docket No.	050337-1020
	First Inventor	Webster et al.
	Title	CYCLIC DIVERSITY SYSTEMS AND METHODS
	Express Mail Label No.	EV558411326US

APPLICATION ELEMENTS See MPEP Chapter 600 concerning utility patent application contents	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450
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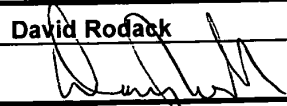
1. ☒ Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original, and a duplicate for fee processing) 2. ☐ Applicant claims small entity status. See CFR 1.27 3. ☒ Specification [Total Pages 23] (preferred arrangement set forth below) Both the claims and abstract must start on a new page (For Example on the preferred arrangement see MPEP 608.01(a)) 4. ☒ Drawing(s) (35 USC 113) [Total Sheets 11] 5. Oath or Declaration [Total Pages 3] a. ☒ Newly Executed (original or copy) b. ☐ Copy from a prior application (37 CFR §1.63(d)) (for continuation/divisional with Box 18 completed) DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b). i. ☐ 6. ☐ Application Data Sheet. See 37 CFR 1.76 7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix) 8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary) a. ☐ Computer Readable Copy (CRF) b. Specification Sequence Listing on: i. ☐ CD-ROM or CD-R (2 copies); or ii. ☐ Paper c. ☐ Statements verifying identity of above copies	ACCOMPANYING APPLICATION PARTS 9. ☒ Assignment Papers (cover sheet & Documents(s)) Name of Assignee <u>Conexant Systems, Inc.</u> <u>4311 Jamboree Road, Newport Beach, CA 92660-3095</u> 10. ☐ 37 CFR 3.73(b) Statement (when there is an assignee) ☐ Power of Attorney 11. ☐ English Translation Document (if applicable) 12. ☒ Information Disclosure Statement (IDS)/PTO-1449 ☒ Copies of citations attached 13. ☐ Preliminary Amendment 14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized) 15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) 16. ☐ Nonpublication Request under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent. 17. ☐ Other:
--	---

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No: /
 Prior application information: Examiner _____ Group / Art Unit: _____

19. CORRESPONDENCE ADDRESS ☒ Customer Number: 24504 OR ☐ Correspondence address below:	
--	--

NAME	Scott A. Horstemeyer		
	Thomas, Kayden, Horstemeyer & Risley, L.L.P.		
ADDRESS	100 Galleria Parkway		
	Suite 1750		
CITY	STATE	ZIP CODE	
Atlanta	Georgia	30339-5948	
COUNTRY	TELEPHONE	FAX	
U.S.A.	770-933-9500	770-951-0933	

Name (Print/Type)	David Rodack	Registration No. (Attorney/Agent)	47,034
Signature		Date	5-4-05

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 1.22 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Effective on 12/08/2004

Fees Pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005**Complete if Known**☐ Applicant claims small entity status. See 37 CFR 1.27**TOTAL AMOUNT OF PAYMENT (\$)** 1,190.00

Application Number	To Be Assigned
Filing Date	May 4, 2005
First Named Inventor	Webster et al.
Examiner Name	To Be Assigned
Art Unit	To Be Assigned
Attorney Docket No.	050337-1020

METHOD OF PAYMENT (check all that apply)☐ Check ☒ Credit Card ☐ Money Order ☐ None ☐ Other (please identify):☐ Deposit Account Deposit Account Number: 20-0778 Deposit Account Name: Thomas, Kayden, Horstemeyer Risley, L.L.P.

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below☐ Charge fee(s) indicated below, except for the filing fee☒ Charge any additional fee(s) or underpayments of fee(s)
under 37 CFR 1.16 and 1.17☒ Credit any overpayments**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	Filing Fees		Search Fees		Examination Fees		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	1,000.00
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESSIVE CLAIM FEES**Fee Description**

Each claim over 20 (including Reissues)

Each independent claim over 3 (including Reissues)

Multiple dependent claims

Fee (\$)	Small Entity Fee (\$)
50	25
200	100
360	180

Total Claims

23 -20 or HP =

Extra Claims

3

Fee (\$)

150.00

Fee Paid (\$)

150.00

Multiple Dependent Claims

Fee (\$)

Fee Paid (\$)

HP = highest number of total claims paid for, if great than 20

Indep. Claims

3 -3 or HP =

Extra Claims

0

Fee (\$)

0.00

Fee Paid (\$)

0.00

HP = highest number of total claims paid for, if great than 3

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 USC 41(a)(1)(G) and 37 CFR 1.16(s)

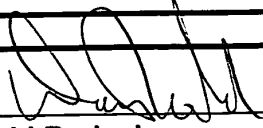
Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
23	-100 =	/50 = 0	(round up to a whole number) x 0.00 =	0.00

4. OTHER FEE(S)**Fee Paid (\$)**

Non-English Specification, \$130 fee (no small entity discount)

Other: Assignment

40.00

SUBMITTED BY		Complete (if applicable)	
Signature		Registration No. 47,034	Telephone Number 770-933-9500
Name: (Print/Type)	David Rodack	Date:	5-4-05

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) and application. Confidentiality is governed by 35 USC 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. Send to Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: **Webster et al.**

For: **Cyclic Diversity Systems and Methods**

CERTIFICATE OF EXPRESS MAIL

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

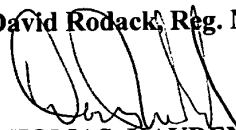
Sir:
Enclosed for filing in the above case are the following documents:

Return Postcard
Utility Patent Application Transmittal Page
Fee Transmittal Page
Utility Patent Application Consisting of:
 17 Pages of Specification
 5 Pages of Claims (Claims 1-23)
 1 Page of Abstract
11 Pages of Formal Drawings (Fig(s). 1, 2, 3A-3B, 4A-4B, 5-6, 7A-7B
 and 8-10)
Assignment of Utility Patent Application (4 pages)
Assignment Recordation Cover Sheet (1 page)
Declaration for Patent Application (3 pages)
Information Disclosure Statement
Form PTO 1449
Cited Prior Art (5 References)
PTO-2038 authorizing payment in the amount of \$1,190.00 for utility
 application, 3 additional claims and assignment recordation fee

Further, the Commissioner is authorized to charge Deposit Account No. 20-0778 for any additional fees required. The Commissioner is requested to credit any excess fee paid to Deposit Account No. 20-0778.

Respectfully submitted,

David Rodack, Reg. No. 47,034



**THOMAS, KAYDEN, HORSTEMEYER
& RISLEY, L.L.P.**
100 Galleria Parkway, N.W.
Suite 1750
Atlanta, Georgia 30339-5948

Our Docket No: **050337-1020**

I hereby certify that all correspondence listed above are being deposited for delivery to the above addressee, with the United States Postal Service "**EXPRESS MAIL POST OFFICE TO ADDRESSEE**" service under 37 CFR §1.10 on the date indicated below:

The envelope has been given U.S. Postal Service "Express Mail Post Office To Addressee" Package # **EV558411326US**.

Date: May 4, 2005


Marianne Boland