PROVISIONAL APPLICATION FOR PATENT COVER SHEET – Page 1 of 2

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

~~Express Mail Label No.~~ _____

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TITLE OF THE INVENTION (500 characters max):

MEDIUM ACCESS CONTROL FRAME STRUCTURE IN WIRELESS COMMUNICATION SYSTEM

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[✔] The address corresponding to Customer Number:

OR

20280

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ENCLOSED APPLICATION PARTS (check all that apply)

[✔] Application Data Sheet. See 37 CFR 1.76

[✔] Specification *Number of Pages* __42__

[✔] Drawing(s) *Number of Sheets* __14__

[ ] CD(s), Number of CDs _____

[ ] Other (specify) _____

Fees Due: Filing Fee of $200 ($100 for small entity). If the specification and drawings exceed 100 sheets of paper, an application size fee is also due, which 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).

METHOD OF PAYMENT OF THE FILING FEE AND APPLICATION SIZE FEE FOR THIS PROVISIONAL APPLICATION FOR PATENT

[ ] Applicant claims small entity status. See 37 CFR 1.27.

[ ] A check or money order is enclosed to cover the filing fee and application size fee (if applicable).

[ ] Payment by credit card. Form PTO-2038 is attached

TOTAL FEE AMOUNT ($)

[✔] The Director is hereby authorized to charge the filing fee and application size fee (if applicable) or credit any overpayment to Deposit Account Number: __502117__. ~~A duplicative copy of this form is enclosed for fee processing.~~

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SIGNATURE / ROLAND K. BOWLER II /   Date AUGUST 15, 2007

TYPED or PRINTED NAME ROLAND K. BOWLER II   REGISTRATION NO. 33,477
                                                                                                            (if appropriate)

TELEPHONE 847-523-3978   Docket Number: CML05790

MEDIUM ACCESS CONTROL FRAME STRUCTURE IN WIRELESS COMMUNICATION SYSTEM

FIELD OF THE DISCLOSURE

[0001]   The present disclosure relates generally to wireless communications and more specifically to medium access control frame structures in wireless communication systems with improved latency support.

BACKGROUND

[0002]   An important consideration for advanced wireless communication systems is one-way air-interface latency. Air-interface latency is primarily dependent on the Medium Access Control (MAC) frame duration. In the developing IEEE 802.16m protocol, for example, the proposed target latency is less than approximately 10 msec and some observers have suggested that a much lower latency may be required to compete with other developing protocols, for example, with 3GPP Long Term Evolution (LTE). The IEEE 802.16m protocol is an evolution of the WiMAX-OFDMA specification for the IEEE 802.16e protocol. However, the legacy IEEE 802.16e TDD frame structure has a relatively long duration and is incapable of achieving the latency targets set for IEEE 802.16m.

[0003]   Evolutionary wireless communication systems should also support for legacy system equipment. For example, some IEEE 802.16e and IEEE 802.16m base stations and mobile stations are likely to coexist within the same network while upgrading to the newer system. Thus IEEE 802.16e mobile stations should be compatible with IEEE 802.16m base stations, and IEEE 802.16e base stations should support IEEE 802.16m mobile stations. Thus

frame structures for air-interfaces are proposed with a view to achieving lower latency and in some embodiments to maintaining backward compatibility.

[0004]   A legacy system is defined as a system compliant with a subset of the WirelessMAN-OFDMA capabilities specified by IEEE 802.16-2004 (specification IEEE Std 802.16-2004: Part 16: IEEE Standard for Local and metropolitan area networks: Air Interface for Fixed Broadband Wireless Access Systems, June 2004) and amended by IEEE 802.16e-2005 (IEEE Std. 802.16e-2005, IEEE Standard for Local and metropolitan area networks, Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems, Amendment 2: Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands, and   IEEE Std. 802.16-2004/Cor1-2005, Corrigendum 1, December 2005) and IEEE 802.16Cor2/D3, where the subset is defined by WiMAX Forum Mobile System Profile, Release 1.0 (Revision 1.4.0: 2007-05-02), excluding specific frequency ranges specified in the section 4.1.1.2 (Band Class Index).

[0005]   The various aspects, features and advantages of the disclosure will become more fully apparent to those having ordinary skill in the art upon careful consideration of the following Detailed Description thereof with the accompanying drawings described below. The drawings may have been simplified for clarity and are not necessarily drawn to scale.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006]   FIG. 1 is a wireless communication system.

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[0007] FIG. 2 is a legacy protocol frame mapped to a next generation 1:2 sub-frame.

[0008] FIG. 3 is a frame structure configuration having a 75 % duty cycle.

[0009] FIG. 4 is another frame structure configuration having a 25 % duty cycle.

[00010] FIG. 5 is a super-frame structure configuration.

[00011] FIG. 6 is a frame having multiple sub-blocks of equal duration.

[00012] FIG. 7 is another frame having multiple sub-blocks of equal duration.

[00013] FIG. 8 is a frame having multiple sub-blocks of equal duration.

[00014] FIG. 9 is a super-frame comprising multiple frames of equal duration.

[00015] FIG. 10 is an exemplary hybrid frame structure.

[00016] FIG. 11 is a frame having first and second protocol resource regions.

[00017] FIG. 12 is another frame having first and second protocol resource regions.

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