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CPC *H04W 52/343* (2013.01); *H04B 7/0408*
(2013.01); *H04B 7/12* (2013.01); *H04W*
52/225 (2013.01); *H04W 52/42* (2013.01)
- (58) **Field of Classification Search**
None
See application file for complete search history.
- (56) **References Cited**

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- (51) **Int. Cl.**
H04W 52/34 (2009.01)
H04B 7/0408 (2017.01)
H04B 7/12 (2006.01)
H04W 52/22 (2009.01)
H04W 52/42 (2009.01)

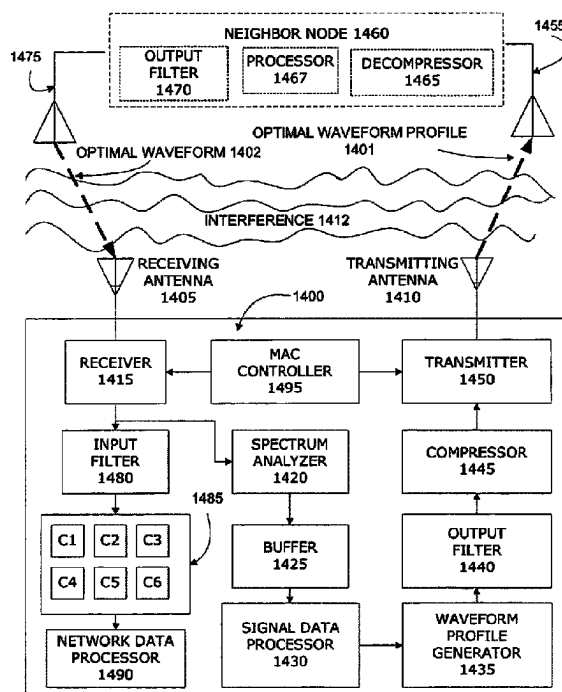
(56) **References Cited**

To view the complete listing of prior art documents cited during the proceeding for Reexamination Control Number 90/019,702, please refer to the USPTO's Patent Electronic System.

Primary Examiner — Matthew E Heneghan

(57) **ABSTRACT**

The present invention increases the available spectrum in a wireless network by sharing existing allocated (and in-use) portions of the RF spectrum in a manner that will minimize the probability of interfering with existing legacy users. The invention provides interference temperature-adaptive waveforms, and a variety of physical and media access control protocols for generating waveforms based on measurement and characterization of the local spectrum. The invention measures the local spectrum at a receiving node, generates an optimal waveform profile specifying transmission parameters that will water-fill unused spectrum up to an interference limit without causing harmful interference to primary and legacy transmitters using the same frequency bands, and enables simultaneous transmit and receive modes at a multiplicity of transceivers in a wireless network. The invention also provides closed loop feedback control between nodes, co-site interference management, intersymbol interference mitigation, wide sense stationary baseband signaling and modulation, and power limited signaling for avoiding detection and interception.



PATENT OWNER
EX. 2015

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**EX PARTE
REEXAMINATION CERTIFICATE**

NO AMENDMENTS HAVE BEEN MADE TO
THE PATENT

AS A RESULT OF REEXAMINATION, IT HAS BEEN
DETERMINED THAT:

The patentability of claims **53-56, 64-66, 70, 76, 81-84**
and **87-94** is confirmed.

Claims **1-52, 57-63, 67-69, 71-75, 77-80, 85, 86, 95** and
96 were not reexamined.

*53. A method for managing interference in a radio com-
munications network, comprising the steps of:*

*receiving at a first node in the radio communications
network an instruction transmitted from a second node
in the radio communications network to avoid using a
plurality of frequencies to transmit to the second node;*

*filtering a transmission signal to remove power from the
transmission signal at each frequency in the plurality of
frequencies to be avoided;*

*transmitting the filtered transmission signal to the second
node;*

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*receiving a compressed first feedback from the second
node that characterizes receipt of a first signal sent
from the first node to the second node;*

*receiving a compressed second feedback from a third node
that characterizes receipt of a second signal sent from
the first node to the third node;*

*decompressing the compressed first feedback resulting in
a decompressed first feedback; and*

*decompressing the compressed second feedback resulting
in a decompressed second feedback;*

*wherein the filtered transmission signal is a filtered first
transmission signal that is transmitted to the second
node using an 802.11-based orthogonal frequency-
division multiplexing (OFDM) protocol via at least one
antenna of a plurality of antennas, using a first power
that is based on the decompressed first feedback; and
further comprising:*

*transmitting, using the 802.11-based OFDM protocol, a
filtered second transmission signal, simultaneously
with the filtered first transmission signal, to the third
node using a second power that is based on the
decompressed second feedback.*

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