REMARKS/ARGUMENTS

After the foregoing Amendment, claims 13-15 are currently pending in this application. Claims 13-15 are amended.

***Claim Rejections - 35 U.S.C.* § 112**

Claims 13-15 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement.

With respect to claims 13-15, paragraphs [0030], [0032], [0044] and [0049] along with FIGs. 3, 4, 15, 16, and 19 define and contrast the difference between the "single user data" and "multiple user data." In FIGs. 3, 15 and 19, the one data signal generator corresponds to "single user data." These FIGs. show the transmission of a single user data being sent to each antenna. In contrast, FIGs. 4 and 16, multiple signal generators correspond to "multiple user data." These FIGs. show the simultaneous transmission of multiple user data being sent to each antenna. Furthermore, FIGs. 15 and 19 show the weighting of the signals and the description of FIG. 15 refers to a "target receiver." The skilled person would realize that the "target receiver" is receiving data for a single user.

Accordingly, Applicant respectfully submits that claims 13-15 meet the requirements of 35 U.S.C 112, first paragraph.

<u>Claim Rejections - 35 U.S.C.</u> **<u>§ 102</u>**

Claim 15 is rejected under pre-AIA 35 U.S.C. 102(e) as being anticipated by Jalali (US patent number 6,778,507, newly cited).

The Office Action states that Jalali discloses combining the single user data signal with a different sequence for each antenna of a plurality of antennas. Jalali, however, does not teach the elements of claim 15 as amended. Jalali teaches that the data to be transmitted is generated in the form of streams of in-band (I) and quadrature (Q) samples that are provided as input to a complex pseudonoise (PN) spreader. The complex PN spreader mixes the I and Q samples with short PN code samples generated by a short PN code generator. Jalali also teaches that the transmissions of each base station are mixed with a PN sequence having PN offsets that allow subscriber stations to distinguish each base station from one another.

Also, Jalali clearly states from each base station that the same signal is transmitted from each antenna, but with each having different relative phase shifts and power levels. Jalali describes the phase shifts on page 6, lines 37-46 which state, "[t]he signals transmitted through the plurality of antennas of a single base station are identical, except for differences in transmit phase. When transmitting a signal to subscriber station 112, base station 102 adjusts the phase of the signals transmitted through the antennas 106 to form a signal beam 110 directed at the one or more receive antennas belonging to subscriber station 112. For example, a signal transmitted through antenna 106a may be transmitted slightly before the same signal transmitted through antenna 106n in order that the two signals arrive in-phase at subscriber station 112." Jalali's teachings are clear in that PN sequences are used to differentiate between base stations and phase shifts that are used to differentiate between transmitting antennas, therefore, Jalali does not teach or suggest combining the single user data signal with a different sequence and a different weight for each antenna of a plurality of antennas.

Jalali teaches a reference signal burst is sent from each antenna of the base station which allows the subscriber station to estimate the channel impulse response corresponding to each of the transmit antennas separately. The reference signal bursts may be separated either by transmitting the bursts through one antenna at a time, or by using a different code space for each antenna, such as a different Walsh code for each antenna. Also, the reference signal may be transmitted simultaneously, but separated by orthogonal coding, for example using a different Walsh code for each antenna. However, a reference signal is not a single user data signal.

In FIG. 3, Jalali teaches how a base station is used to transmit signals to one or more subscriber stations in a cell through multiple transmit antennas. However, Jalali does not teach or disclose transmitting the single user data combined with the plurality of different sequences and the produced pilot bits for the plurality of antennas to the receiving device. Jalali's only reference to the data pilot is shown in

FIG. 2, and page 11, lines 58-61 which state, "the beam used to transmit the DRC reference portion of the signal 206 may be different than the beam used to transmit the data pilot 208 and subscriber 60 station data 210 portions of each slot 202." Defining the position of the data pilot in a transmission scheme is not the same as transmitting the single user data combined with the plurality of different sequences and the produced pilot bits for the plurality of antennas to the receiving device.

***Claim Rejections - 35 U.S.C.* § 103**

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jalali (US patent number 6,778,507, newly cited) in view of Vook et al., Vook hereinafter (US patent number 5,982,327, of a record and previously cited by Applicant).

The Office Action states that Jalali discloses receiving a signal which includes a single user data that was combined with a different sequence from each transmitted antenna. Jalali, in view of Vook, however, does not teach the elements of claims 13 and 14 as amended. Jalali teaches that the data to be transmitted is generated in the form of streams of in-band (I) and quadrature (Q) samples that are provided as input to a complex pseudonoise (PN) spreader. The complex PN spreader mixes the I and Q samples with short PN code samples generated by the short PN code generator. Jalali also teaches that the transmissions of each base station are mixed with a PN sequence having PN offsets that allow subscriber stations to distinguish each base station from one another. Also, Jalali clearly states from each base station that the same signal is transmitted from each antenna, but with each having different relative phase shifts and power levels.

The Office Action also states that Jalali discloses the received signal includes pilot bits for each of the plurality of antennas and wherein the pilot bits for each antenna were derived from a different sequence for that antenna. Jalali's only reference to the data pilot is shown in FIG. 2 and page 11, lines 58-61 which state, "the beam used to transmit the DRC reference portion of the signal 206 may be different than the beam used to transmit the data pilot 208 and subscriber 60 station data 210 portions of each slot 202." Defining the position of the data pilot in a transmission scheme is not the same as transmitting the single user data combined with the plurality of different sequences and the produced pilot bits for the plurality of antennas to the receiving device. The Office Action continues to state that Jalali discloses that the pilot bits are spread with respective orthogonal Walsh codes for use in beamforming of the transmitter. Jalali teaches a reference signal burst is sent from each antenna of the base station which allows the subscriber station to estimate the channel impulse response corresponding to each of the transmit antennas separately. The reference signal bursts may be separated either by transmitting the bursts through one antenna at a time, or by using a different code space for each antenna, such as a different Walsh code for each antenna. Also, the reference signal may be transmitted simultaneously, but separated by orthogonal coding, for example using a different Walsh code for each antenna. However, a reference signal is not a single user data signal.

The Office Action also states that Jalali discloses deriving preferred weight for the received signal based on pilot bits for each antenna. However, Jalali discloses that the beam used to transmit the DRC reference portion of the signal may be different than the beam used to transmit the data pilot and subscriber station data portions of each slot. Also, Jalali does teach or disclose the deriving of a preferred weight. Therefore, we respectfully disagree that Jalali discloses any type of preferred weight for the received signals based on pilot bits.

Vook teaches a method of a subscriber unit receiving the same data signal over several antennas based on a process using at least two covariance matrices and at least two steering vectors determined from the pilot symbols. Vook also teaches that if more than one transmitter is assigned to transmit to the receiver in a time-frequency slot, then an access technique called spatial division multiple access (SDMA) is used by the receiver. Vook teaches the communication receiver to receive, separately, the signals transmitted by the multiple transmitters sharing the same time-frequency slot. However, Vook does not teach the recovering of a single user data signal from each of the different sequences and combining of the recovered single user data signal from each of the different sequences. Covariance matrices and steering vectors are not sequences.

Based on the arguments presented above, withdrawal of the 103(a) rejection of claims 13-14 is respectfully requested.

Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephonic interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing, Applicant respectfully submits that the present application, including claims 13-15, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

David K. Mesecher

By /Jeffrey M. Glabicki/
Jeffrey M. Glabicki
Registration No. 42,584

Volpe and Koenig, P.C.
United Plaza
30 South 17th Street
Philadelphia, PA 19103-4009
Telephone: (215) 568-6400
Facsimile: (215) 568-6499
JMG/JDW/bbf