APPEAL DECISION

Appeal No. 2016-5935

USA
Appellant QUALCOMM INC.

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The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2014-511428, entitled "Systems and methods for wireless communication of packets having a plurality of formats" [international publication on November 22, 2012, International Publication No. WO2012/158565; national publication of the translated version on July 17, 2014, National Publication of International Patent Application No. 2014-517608, the number of claims (40)] has resulted in the following appeal decision:

Conclusion

The examiner's decision is revoked.

The Invention of the present application shall be granted a patent.

Reason

No. 1 History of the procedures

The application was originally filed on May 11, 2012 (priority claim under the Paris Convention, received by the foreign receiving office, May 13, 2011, the US; May 21, 2011, the US; December 19, 2011, the US; December 27, 2011, the US; January 11,

2012, the US; and May 8, 2012, the US) as an international filing date and a notice of reasons for refusal (hereinafter, referred to as "the reasons for refusal of the original examination") was issued on June 29, 2015. Against this, a written amendment was submitted on October 7, 2015 and the examiner's decision of refusal (referred to as "the Examiner's decision") was issued on December 18, 2015. Against this, an appeal against the examiner's decision of refusal was made on April 21, 2016.

No. 2 The Invention

The inventions relating to Claims 1-40 of the present application are acknowledged as specified by the matters described in Claims 1-40 in the scope of claims which were amended by the written amendment dated October 7, 2015, and the invention relating to Claim 1 of the present application (hereinafter, referred to as "The Invention") is as follows:

"An apparatus for wireless communication, comprising:

a receiver configured to receive a wireless communication comprising a physical layer preamble and a payload, the preamble including a long training field (LTF) indicating whether the payload includes data which is repetition coded and whether the data is repetition coded is indicated by the rotation of the LTF or of one or more symbols of the LTF; and

a processor configured to process the payload according to whether the payload includes the repetition coded data."

No. 3 Summary of the reasons for the examiner's decision

1. Reasons for refusal of the original examination

"1. (Inventive step) The inventions relating to the following claims in this application could have been easily made by a person of ordinary skilled in the art of the inventions based on the inventions described in the following publications that had been distributed in Japan or a foreign country or the inventions that had become available to the public through electric communication lines prior to the filing of the application. Thus, the appellant should not be granted a patent for the inventions under the provisions of Article 29(2) of the Patent Act.

2. (... omitted ...)

Description (For cited documents, etc., refer to 'List of Cited Documents, etc.')

*Regarding Reason 1 (inventive step)

*Claims 1, 2, 5-7, 10-12, 15-17, 20-22, 25-27, 30-32, 35-37, and 40
*Cited documents, etc. 1-4
*Remarks

A communication system that uses information on repetition coding of a payload as communication parameter information is also well known: for example, Cited Document 1 (especially FIGS. 5 and 7 and descriptions thereof) and Cited Document 2 (especially paragraph 50); and especially in Cited document 1, an LTF field as a preamble is also described.

Here, it is acknowledged that a person skilled in the art could easily conceive of notifying of information on repetition coding that is communication parameter information by applying the well-known arts described in Cited Documents 3 and 4, in a system: which is well known in the communication technology field as disclosed in Cited Document 3 (especially Claims 1-4, paragraphs 21, 22, 24, 25, 29, 34, 60, and 64-73, FIGS 8, 10, and 11; in paragraphs 64 and 65, '... When performing symbol repetition on the header or the payload, ... to perform the same characterization as that of the repetition pattern applied to the preamble' and in addition, as characterization, 'symbol phase' and 'multiplication' by a 'complex code sequence' are indicated and the rotation of at least a part is indicated) and Cited Document 4 (especially paragraphs 19, 20, and 32-34); and a person skilled in the art could easily conceive of notifying of information on repetition coding that is communication parameter by applying well-known arts describe in Cited Documents 3 and 4 to the system described in Cited Documents 1 and 2.

It should be noted that which specific values are to be set for the modulation scheme, code rate, etc. is merely a matter that is properly designed by a person skilled in the art.

(... omitted ...)

<List of Cited Documents, etc.>

1. International Publication No. WO 2011/053069 (document indicating well-known arts)
2. U.S. Patent Application Publication No. 2007/0097915 (document indicating well-known arts)
3. Japanese Unexamined Patent Application Publication No. 2010-258599 (document

indicating well-known arts)
4. National Publication of International Patent Application No. 2003-515973 (document indicating well-known arts)
5. (Hereinafter omitted)"

2 Outline of the examiner's decision

"The present application should be rejected based on Reason 1 described in the notice of reasons for refusal dated June 29, 2015.

It should be noted that although the contents of the written opinion and written amendment were examined, sufficient grounds for overturning the reasons for refusal were not found.

Remarks
*Regarding Reason 1 (Article 29(2) of the Patent Act)

*Claims 1 and 40
*Cited documents, etc. 1-5

The applicant of the present application alleges in the written opinion that the Invention is characterized as ‘whether the data are repetition-coded is indicated by the LTF or the rotation of one or more symbols of the LTF’ and on the other hand, Cited Documents 1-5 which were presented in the above notice of reasons for refusal do not include such description and thus they are different in this point and the Invention could not be easily conceived of based on the above Cited Documents 1 to 5. Thus, the following is examined.

Cited Document 3 (especially Claims 1-4, paragraphs 21, 22, 24, 25, 29, 34, 57, 60, and 64-74, FIGS 8, 10-12, 14, and 15) discloses a technique for associating the repetition pattern for a preamble (corresponding to the LTF) with the number of repetitions (corresponding to the repetition coding, no repetition for one time) that is a communication parameter relating to a payload so that the number of repetitions can be obtained without explicit notification of the number of repetitions, and also discloses that the pattern is one that corresponds to a change in the phase and to ‘rotation’ as multiplication of a complex code.

In addition, Cited Document 4 (especially paragraphs 19, 20, and 32-34) also discloses a technique for rotating a training sequence so that a modulation scheme can

be obtained without explicit notification of the modulation scheme that is a communication parameter relating to a payload.

Such techniques for notifying of a communication parameter by rotation of a predetermined symbol are the well-known and commonly used technique for reduction in an overhead, etc. in the communication technology field, and although not being identical to the above feature point of the Invention, adopting such techniques as described in Cited Documents 3 and 4 in various well-known systems could be appropriately achieved by a person skilled in the art. For example, as described in Cited Documents 1 and 2, adopting such techniques as including an LTF (as a preamble, training sequence), adopting repetition coding on a well-known system capable of adopting it, and indicating a parameter relating to the repetition coding by rotation of the LTF could be easily conceived of by a person skilled in the art.

In such a case, there is no particular point in comparison between the inventions relating to the claims and the inventions described in Cited Documents 1-5.

Accordingly, the above allegation by the applicant of the present application shall not be adopted.

<List of Cited Documents, etc.>

1. International Publication No. WO 2011/053069 (document indicating well-known arts)
2. U.S. Patent Application Publication No. 2007/0097915 (document indicating well-known arts)
3. Japanese Unexamined Patent Application Publication No. 2010-258599 (document indicating well-known arts)
4. National Publication of International Patent Application No. 2003-515973 (document indicating well-known arts)
5. (Hereinafter omitted)"

Thus, the object of the reasons for refusal of the examiner's decision is such that the invention relating to Claim 1 in the scope of claims before the amendment could be easily made by a person skilled in the art by taking the well-known arts described in Cited Documents 3 and 4 into consideration on the basis of Cited Document 1 or Cited Document 2, and thus the appellant should not be granted a patent for the invention under the provisions of Article 29(2) of the Patent Act.

In the reasons for refusal of the original examination and the examiner's decision,

Cited Document 1 and Cited Document 2 were not discussed separately and therefore, in the following sections, a case where Cited Document 1 is considered as a primary cited document is judged, and judgment on a case where Cited Document 2 is considered as a primary cited document is omitted.

No. 4 Judgment by the body
1. Described matters in Publication
(1) Cited Invention

International Publication No. WO 2011/053069 (hereinafter, referred to as "the Cited Document") that was cited in the examiner's decision describes the following matters with drawing regarding "TRANSMISSION METHOD OF DATA IN MULTI-USER WIRELESS COMMUNICATION SYSTEM" (Descriptions are based on US 2012/0207097 A1 which is patent family of the Cited Document.)

A "[0001] Exemplary embodiments of the present invention relate to an apparatus and a method for transmitting data in a multi-user wireless transmission system; and, more particularly, to a method and an apparatus for improving data transmission efficiency in a multi-user wireless transmission system." (Page 1)

B "[0013] In accordance with the present invention, the MCS is modified, based on the degree of interference, in the PPDU of a data field inside a STA, thereby improving the data transmission rate in a multi-user wireless communication environment where multiple STAs make transmissions simultaneously. Repetition of a training field, a signal field, and a data field reduces the error probability of the signal and data field and improves reliability of transmitted data." (Page 1)

C "[0053] FIG. 5 illustrates an example of repeating a data field of a PPDU in accordance with the present invention.
[0054] FIG. 5 illustrates two cases for repeating the data field of a PPDU in accordance with the present invention, based on the case of FIG. 2 described above. Specifically, in the first case of (a), the data field of the PPDU is repeated integer times and, in the case of (b), the data field is repeated partially so that its length equals that of a PPDU which is the longest. Each case will now be described.
[0055] In the case of (a), a repetition data field 511, which has the same size as the data field 510 of STA2, is repeated to be continuous. This is the same as in the case of STA3. That is, a shorter data field 520 is included in the case of STA3, and a first repetition

data frame 521 and a second repetition data frame 522 are transmitted continuously.
[0056] In the case of (b), the data field of STA1, which is the longest, serves as the reference. Specifically, in the case of STA2, the data field 530 is followed by a first repetition data field 531 of the same size, and a second repetition data field 532 is positioned, which is partially repeated. The same is applied to the case of STA3. Specifically, the data field 540 transmitted to STA3 is followed by first and second repetition data fields 541 and 542, which are full repetitions of the data field 540, and by a third repetition data field 543, which is a partial repetition of the data field. " (Page 3)

D " [0062] Repetition of data in the above-mentioned manner requires that relevant information be transmitted through a control signal. Methods for informing of data repetition through a control signal will now be described.
[0063] (1) Integer-times repetition can be made known through a control signal including the following information:
[0064] The repetition method is made known. For example, information indicating repetition of the data field or symbol needs to be included.
[0065] Repetition number information needs to be included.
[0066] Frequency shift index information needs to be included.
[0067] (2) Partial repetition can be made known through a control signal including the following information.
[0068] The repetition method is made known. For example, information indicating repetition of the data field or symbol needs to be included.
[0069] Repetition number information needs to be included.
[0070] Frequency shift index information needs to be included.
[0071] Information regarding the number of partial repetition symbols needs to be included.
[0072] A PPDU format including VHT-SIG for transmitting the above-mentioned control signal can be transmitted in a format as described with reference to FIG. 3. " (Page 3)”

According to the above A and B, the Cited Document includes descriptions about wireless transmission of data by multiple STAs; in other words, wireless reception of data from multiple STAs. Here, it is optional to refer to an apparatus on the reception side as "a receiving apparatus" and refer to means for reception as "receiving means."

In addition, according to the above B and FIG. 5, it is understood that the data

comprise a training field, a signal field, and a data field, and according to descriptions of FIG. 3, FIG. 5, etc. it is understood that the training field comprises an LTF; that is, a long training field.

Furthermore, according to the above C, FIG. 5, and FIG. 7, there are cases where the "data field" is repeatedly received; and according to the above D, when the "data field" is repeatedly received, a control signal including repetition number information is notified in VHT-SIG; that is, the "signal field." In this case, it is obvious that the receiving apparatus processes the "data field" on the basis of the control signal. In addition, it is optional to refer to means for processing as "processing means."

Then, in view of the above A to D and technical common sense as of the priority date of the present application, it is acknowledged that the Cited Document describes the following invention (hereinafter, referred to as "the Cited Invention").

"A receiving apparatus comprising:

receiving means for receiving data comprising a training field, a signal field, and a data field, wherein the training field includes a long training field (LTF), and when the data field is repeatedly received, a control signal including repetition number information of the data field is included in the signal field; and

processing means for processing the data field according to the control signal in the signal field."

(2) Well-known matters

Japanese Unexamined Patent Application Publication No.2010-258599 (hereinafter, referred to as "Well-Known Example 1") that was cited in the examiner's decision describes the following matters with drawings with regard to "Wireless communication apparatus, wireless communication method, computer program, and wireless communication system" (title of the invention).

E "[0029]

Furthermore, the packet-generating section 11 characteristically carries out symbol repetition on at least one of the preamble, header, and payload of the packet. For example, the packet-generating section 11 performs symbol repetition for every symbol or for every predetermined symbol unit. In addition, the packet-generating section 11 alters at least any of the number of times of symbol repetition, a symbol amplitude, a symbol phase, and a complex symbol series. Furthermore, the packet-generating section

11 characteristically carries out symbol repetition depending on at least one of the type of the packet and the antenna-directivity pattern." (Page 8)

F "[0034]

The packet-processing section 33 includes a header decoder 331 and a payload decoder 332. When the preamble detector 32 has detected the preamble, the header decoder 331 decodes a header next to the detected preamble to acquire head information. When the preamble detector 32 has detected the preamble, the payload decoder 332 decodes a payload determined based on this detected preamble and then outputs a data signal. Specifically, when the preamble detector 32 has detected the preamble, the header decoder 331 and the payload decoder 332 decode the header and the payload on the basis of timing-identification signal generated by the preamble detector 32 which is capable of identifying the timing of starting the header and the timing of the payload as described later." (Page 8)

G "[0058]

Here, the complex symbol series is selected so that many series with higher orthogonality can be obtained as much as possible. Therefore, by selecting the complex symbol series as described above, for example, the use of different complex symbol series allows the operations of two or more wireless communication systems to be coexistent even if the same space, the same time, and the same frequency channel are used. FIG. 10 illustrates a case that the repetition of basic pattern is repeated on the preamble and the repeated basic patterns are multiplexed by their respective different complex symbol series and the complex symbol series to be multiplexed is changed depending on the number of times of the basic pattern repetition.

[0059]

For instance, if the number of times of the basic pattern repetition is one, then the complex symbol series C1 (0) is used. In addition, if the number of times of the basic pattern repetition is two, then the complex symbol series C2 (0) and C2 (1) are used. The first basic pattern sp is multiplied by the complex symbol series C2 (0), and the second basic pattern sp is multiplied by the complex symbol series C2 (1). In addition, if the number of times of the basic pattern repetition is four, then the complex symbol series C4 (0) to C4 (3) are used. The first basic pattern sp is multiplied by the complex symbol series C4 (0), and the second basic pattern sp is multiplied by the complex symbol series C4 (1). Furthermore, the third basic pattern sp is multiplied by the complex symbol series C4 (2) and the last basic pattern sp in the repetition is then

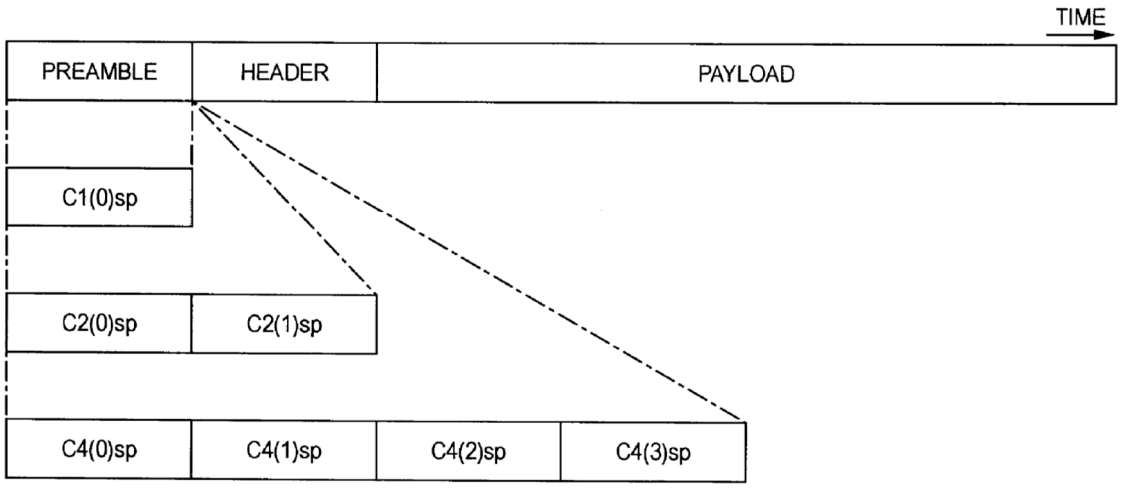
multiplied by the complex symbol series C4 (3)." (Page 11)

H "[0065]

When performing symbol repetition on the header or the payload, any repetition pattern may be employed at will. However, it is desirable to perform the same characterization as that of the repetition pattern applied to the preamble. Therefore, as the repetition pattern has been already recognized at the time of decoding the header or the payload, it is possible to omit the operation of detecting a repetition pattern on the header or the payload. Thus, the gain of the head or the payload can be easily increased." (Page 12)

I "

FIG. 10



" (FIG. 10)

According to the above G and I (FIG. 10), in Well-Known Example 1, considering that the basic pattern sp is changed by the complex code sequence C1(0) also in a case where "the number of repetitions is 1," the repetition pattern can be characterized for the preamble even when the preamble is not repeated (the number of repetitions is 1) in the above H; and accordingly, it is construed that even when the preamble is not repeated, characterization therefor is used for characterization for the payload.

According to the above E and G, it is acknowledged that the following matter is described as a well-known matter in Well-Known Example 1. (Hereinafter, it is

referred to as "Well-Known Matter 1".)

"A symbol repetition pattern (number of repetitions ≥ 1) is characterized by changing the number of symbol repetitions, phase of the symbol, amplitude of the symbol, or complex code sequence for multiplication,

the same characterization as the one applied to the repetition pattern in a preamble is also applied to the repetition pattern in a payload, and

a wireless communication apparatus decodes a payload on the basis of the characterization applied to the repetition pattern in a received preamble."

National Publication of International Patent Application No. 2003-515973 (hereinafter, referred to as "Well-Known Example 2") that was cited in the examiner's decision describes the following matters with drawings with regard to "Modulation blind detection method and system" (title of the invention).

J "[0033]

After the bursts 16 are modulated using the selected modulation and coding scheme, the training sequence is rotated using a rotation that corresponds to the selected modulation scheme (e. g., $\pi/2$ for GMSK or $3\pi/8$ for 8-PSK). The modulated bursts 16 with the rotated training sequences are then forwarded to the transmitter 44, which transmits the bursts 16 over the air interface as part of the TDMA frames 18." (Page 20)

In the above J, the rotation for modulation as that for the training sequence is used for the burst modulation and therefore, it can be said that the rotation for modulation of a training sequence indicates the modulation scheme of a burst.

Thus, according to the above J, it is acknowledged that the following matter is described as a well-known matter in Well-Known Example 2. (Hereinafter, it is referred to as "Well-Known Matter 2".)

"The modulation scheme of a burst is indicated by the rotation for modulation of a training sequence."

3. Comparison

The Invention and the Cited Invention are compared.

It is technical common sense that, in the Cited Invention, data are transmitted/received in the "physical layer" and the training field and signal field constitute the "preamble;" and therefore, the "training field" and "signal field" in the Cited Invention correspond to the "physical layer preamble" in the Invention.

In addition, the "data field" in the Cited Invention corresponds to the "payload" in the Invention.

In addition, the "data" in the Cited Invention are wirelessly communicated (received) and therefore, this corresponds to the "wireless communication" in the Invention. Furthermore, the "receiving apparatus" in the Cited Invention can be said to be the "apparatus for wireless communication" in the Invention.

In the Cited Invention, it is obvious that the "data field" is one that has been coded; that is, one for which "coding" has been performed. Accordingly, the feature in the Cited Invention that the "data field" is "repeatedly received" is equal to the feature in the Invention that the received "payload" "includes repetition-coded data."

In addition, in the Cited Invention, the "control signal" is included "when the data field is repeatedly received" and therefore, it is obvious that whether or not "the data field is repeatedly received" can be determined by the "signal field."

Then, the Cited Invention and the Invention are common in that "the preamble includes information indicating whether the payload includes repetition-coded data, and whether the data are repetition-coded is indicated by the information."

In addition, the "receiving means" in the Cited Invention corresponds to the "receiver" in the Invention except for the different feature which is described later.

In addition, "according to the control signal in the signal field" in the Cited Invention corresponds to "according to whether the payload includes the repetition-coded data" in the Invention.

Furthermore, it is obvious that a receiving apparatus includes a "processor" and therefore, it is obvious that the "processing means" in the Cited Invention includes the "processor" in the Invention.

According to the above examination, the Invention and the Cited Invention are identical and different in the following points.

[Corresponding features]

"An apparatus for wireless communication comprising:

a receiver configured to receive wireless communications including a physical layer preamble and a payload, wherein the preamble includes information that indicates whether the payload includes repetition-coded data, and whether the data are repetition-coded is indicated by the information; and

a processor configured to process the payload according to whether the payload includes the repetition-coded data."

[The different features]

"The "information that indicates whether the payload includes repetition-coded data" is included in the "long training field (LTF)" in the Invention; whereas in the Cited Invention, the information is included in the "signal field." In addition, "whether the data are repetition-coded" is "indicated by the rotation of the LTF or of one or more symbols of the LTF"; whereas in the Cited Invention, it is notified by the "control signal" in the "signal field."

4. Judgment

The above different features are examined.

It is obvious from FIG. 10 in Well-Known Example 1 that Well-Known Matter 1 allows multiplication by the "complex code sequence" to be performed for a preamble irrespective of whether or not repetition is performed. Therefore, "characterization" applied to the "repetition pattern in a preamble" in Well-Known Matter 1 does not indicate "whether the data are repetition-coded."

In addition, in Well-Known Matter 2, the rotation for modulation of a training sequence (preamble) indicates a "modulation scheme" for a burst (data) and does not indicate "whether the data are repetition-coded."

In addition, an aspect in which Well-Known Matter 1 and Well-Known Matter 2 are partially combined cannot be combined into the Cited Invention.

Furthermore, the feature of using a "long training field (LTF)" in the preamble for indicating "whether the data are repetition-coded" is not described in either of Well-Known Matter 1 and Well-Known Matter 2, and also cannot be said to be technical common sense as of the priority date of the application.

Therefore, even a person skilled in the art cannot conceive of the configuration of the Invention relating to the different feature by applying the well-known matters to the Cited Invention.

Therefore, it cannot be said that a person skilled in the art could easily make the

Invention by taking the well-known matters into consideration on the basis of the Cited Invention.

The inventions relating to Claims 6, 11, and 16 are ones for specifying the Invention with the category of the invention changed, and the inventions relating to Claims 21, 26, 31, and 36 are ones for specifying the Invention as one relating to an apparatus on the reception side; they substantially have technical features which are identical or corresponding to the Invention. Therefore, it cannot be said that a person skilled in the art could easily invent them by taking the well-known matters into consideration on the basis of the Cited Invention.

The inventions relating to Claims 2 to 5, 12 to 15, 17 to 20, 22 to 25, 27 to 30, 32 to 35, and 37 to 40 of the present application include technical features which further limit the Invention; and therefore, as with the Invention, it cannot be said that a person skilled in the art could easily make them by taking the well-known matters into consideration on the basis of the Cited Invention.

No. 5 Closing

As described above, the inventions relating to Claims 1-40 of the present application could not be easily made by a person skilled in the art on the basis of the Cited Invention and therefore, the present application cannot be rejected due to the reasons of the examiner's decision.

In addition, no reasons for refusal were found.

Therefore, the appeal decision shall be made as described in the conclusion.

January 24, 2017

Chief administrative judge: OTSUKA, Ryohei
Administrative judge: HAYASHI, Tsuyoshi
Administrative judge: NAKANO, Hiromasa