Date	November 22, 2016	Court	Intellectual Property High Court Third Division
Case number	2016 (Gyo-Ke) 10010		
– A case in which, with respect to an invention titled "individual interleaving of data streams for MIMO transmission," the court maintained the JPO decision which dismissed the request for a trial against the examiner's decision of refusal by holding that the invention involves no inventive steps.			

Reference: Article 29, paragraph (2) of the Patent Act

Number of related rights, etc.: Trial against Examiner's Decision of Refusal No. 2014-18453, Patent Application No. 2007-545079

Summary of the Judgment

1. The plaintiff filed a patent application for an invention titled "individual interleaving of data streams for MIMO transmission" (hereinafter referred to as the "Invention") but received a decision of refusal. Dissatisfied, the plaintiff filed a request for a trial.

   In this case, since the JPO rendered a trial decision ("JPO Decision") to dismiss the plaintiff's request for a trial against the examiner's decision of refusal, the plaintiff instituted an action seeking rescission of the JPO Decision.

2. In this judgment, the court mainly held as follows and found that, under the following circumstances, a person ordinarily skilled in the art could have easily conceived of the structure of the Invention by such means as making the multiple antenna mode and single antenna mode switchable with respect to the cited invention. Based on this finding, the court held that the Invention cannot be patented based on Article 29, paragraph (2) of the Patent Act.

(1) The cited invention has been created as a MIMO system to transmit data using multiple antennas by improving the SISO system. It is well-known that MIMO system has backward compatibility and thus, there is sufficient motivation to have the cited invention achieve backward compatibility.

(2) It is well-known to make the transmission mode using multiple antennas and that using a single antenna switchable as a specific example of achieving backward compatibility.

(3) It is natural to make the interleaving method employed in a single antenna mode and that employed in a multiple antenna mode the same at the time of introducing a single antenna mode to the cited invention.

Judgment rendered on November 22, 2016
2016 (Gyo-Ke) 10010, Case of Seeking Rescission of JPO Decision
Date of conclusion of oral argument: September 27, 2016

Judgment

Plaintiff: Koninklijke Philips N.V.

Defendant: Commissioner of the JPO

Main text

1. The plaintiff's claims shall be dismissed.
2. The court costs shall be borne by the plaintiff.
3. The additional period for filing a final appeal and a petition for acceptance of final appeal with respect to this judgment shall be 30 days.

Facts and reasons

No. 1 Claims

The JPO decision rendered with respect to Case of Trial against Examiner's Decision of Refusal No. 2014-18453 on September 7, 2015 shall be rescinded.

No. 2 Facts on which the decision is premised (there are no disputes between the parties with respect to these facts)

1. Developments in procedures at the JPO

The plaintiff filed a patent application with respect to an invention titled "individual interleaving of data streams for MIMO transmission" by using a part of a patent application (Patent Application No. 2007-545079) whose international application date is December 13, 2005 (priority claim under the Paris Convention for the Protection of Industrial Property: December 13, 2004 (priority date); the U.S. (priority country); October 5, 2005 (priority date); the U.S. (priority country)) as a new patent application on October 10, 2012 (Patent Application No. 2012-224647; the "Application"), but received a decision of refusal on May 9, 2014.

Thus, the plaintiff filed a request for a trial against the examiner's decision of refusal against the JPO (Trial against Examiner's Decision of Refusal No. 2014-18453) on September 16 of the same year. In response to this, the JPO rendered a trial decision to dismiss this request (90 days were added as the statute of limitations for filing an action; hereinafter referred to as the "JPO Decision") on September 7, 2015 and the certified copy thereof was served to the plaintiff on the 17th of the same month.

On January 15, 2016, the plaintiff filed this action.

2. Scope of claims

The invention described in Claim 1 (hereinafter referred to as the "Claimed Invention") of the Application is as follows.

"[Claim 1] A method of transmitting data using either a single antenna or multiple antennas, comprising: when transmitting data using a single antenna, performing block interleaving of said data employing the first interleaving method prior to transmission; and when transmitting data using multiple antennas: forming multiple second data streams from the first data stream and assigning successive bits in said first data stream to different streams of said second data streams; performing block interleaving of multiple streams of said second data streams employing an interleaving method identical with said first interleaving method and grouping bits into symbols during such block interleaving; and performing a reordering of symbols such that symbols from one of said second data streams are reordered as compared to the symbols from another of said second data streams."

3. Summary of the reasons of the JPO Decision

The reasons of the JPO Decision, which are as stated in the attached written decision (copy), can be summarized as follows: As described below, the Claimed Invention could have been easily made by a person ordinarily skilled in the art based on the invention stated in Exhibit Ko 1 (Oghenekome Oteri, Arogyaswami Paulraj, William J. Chimitt, Keith Holt, "SPACE-TIME-FREQUENCY CODING FOR OFDM-BASED WLANs" published in 2004; hereinafter referred to as the "Cited Document"; Attachment 1) (hereinafter said invention shall be referred to as the "Cited Invention") and well-known arts, and thus cannot be patented pursuant to Article 29, paragraph (2) of the Patent Act (hereinafter referred to as the "Act"). Accordingly, the Application must be refused.

(1) Cited Invention

"A method of transmitting data using multiple antennas, comprising: when transmitting data using multiple antennas, forming two antenna streams from a coded and punctured coding bit stream and assigning the successive bits of said coding bit steam to different streams of said two antenna streams; performing block interleaving of said two antenna streams by using an interleaver based on the 802.11a standard; and performing cyclic shift for one of said two antenna streams."

(2) Comparison between the Claimed Invention and Cited Invention

A. Common features

"A method of transmitting data using multiple antennas, comprising: when transmitting data using multiple antennas: forming multiple second data streams from the first data stream, assigning successive bits in said first data stream to different streams of said second data streams; performing block interleaving of multiple streams of said second data streams employing an interleaving method identical with the method employed at the time of

transmitting data using a single antenna; and performing a reordering such that one of said second data streams are reordered as compared to another of said second data streams."

B. Difference 1

While the Claimed Invention is "a method of transmitting data using either a single antenna or multiple antennas" and has the structure of "when transmitting data using a single antenna, performing block interleaving of said data employing the first interleaving method prior to transmission," the Cited Invention is "a method of transmitting data using multiple antennas" and contains no reference on the transmission of data using a single antenna.

C. Difference 2

While the Claimed Invention has the structure of "grouping bits into symbols during such block interleaving," the existence of such structure has not been clarified in the Cited Invention. In addition, with respect to the common feature of "performing a reordering such that one of said second data streams are reordered as compared to another of said second data streams," it is described in the Claimed Invention that "performing a reordering of symbols such that symbols from one of said second data streams are reordered as compared to symbols from another of said second data streams," but the specific processing of the cyclic shift made in the Cited Invention remains unclear.

(3) Determination

A. Regarding Difference 1

It is a general problem to be solved in the field of wireless digital communications to achieve backward compatibility, and it is obvious for a person ordinarily skilled in the art that the fact that the Cited Invention is designed to perform interleaving using an interleaver based on the IEEE802.11a standard (hereinafter referred to as the "802.11a standard"; the same abbreviation shall be used for other 802.11 standards) also contributes to backward compatibility.

In addition, even MIMO (Multiple Input Multiple Output; hereinafter referred to as "MIMO") communication devices are commonly created in a manner to enable transmission by the use of a single antenna.

As such, it is not particularly difficult to introduce to the Cited Invention a mode for conducting transmission using a single antenna for the purpose of achieving backward compatibility, which is a general problem to be solved, and this can be easily carried out by a person ordinarily skilled in the art. Moreover, in light of the fact that, under the 802.11a standard, data is transmitted using a single antenna, it is nothing but natural to make the interleaving at the time of transmitting data using a single antenna performed by using an interleaver based on the 802.11a standard.

Therefore, a person ordinarily skilled in the art could have easily arrived at Difference 1.

B. Regarding Difference 2

Taking into account the following facts, it is natural to construe that the structure of "grouping bits into symbols during such block interleaving" of the Claimed Invention means that a group consisting of a prescribed number of successive bits that is to be mapped into symbols will be formed: [a] symbols themselves are formed by symbol mapping and interleaving is a processing conducted at a stage prior to symbol mapping; and [b] symbol mapping refers to the act of mapping the prescribed number of successive bits respectively into each modulated symbol (constellation). As such, since QAM Modulator maps the prescribed number of successive bits of the interleaved antenna stream respectively into each modulated symbol (constellation) in the Cited Invention as well, it can be said that bits are grouped into symbols during block interleaving.

Moreover, according to the statements in Claim 1 which read "performing a reordering of symbols such that symbols from one of said second data streams are reordered as compared to symbols from another of said second data streams," it may be construed that such structure includes the case where the contents of the group consisting of a prescribed number of bits that will be mapped into symbols will be changed as a result of the reordering of the bits input in the symbol mapping device instead of the reordering of the symbols generated, in other words, symbols are substantially reordered, or where symbols become different ones as a result of the change in the contents of multiple bits that constitute one symbol.

On the other hand, with respect to the cyclic shift of the Cited Invention, the specific amount of shift remains unclear. However, if the amount of shift of the cyclic shift is a multiple of the prescribed number of successive bits that will be mapped into one symbol, the symbols will substantially be reordered without having the bits inside each symbol being moved and if the amount of shift is other than a multiple of said prescribed number of bits, the symbols will become different ones as a result of the change in the contents of the multiple bits constituting one symbol, and thus it is obvious that the cyclic shift of the Cited Invention will be included in the structure wherein "symbols from one of the two antenna streams are reordered as compared to symbols from another of said two antenna streams." Accordingly, it should be found that there is no substantial difference between the Claimed Invention and the Cited Invention.

Furthermore, as disclosed in the description of the Claimed Invention [0016], even if the structure of "performing the reordering of symbols […]" of the Claimed Invention refers to, for example, the cyclic rotation of 57 frequency tones in OFDM in Operation C (316c) shown in Figure 3, in light of the relations between Figures 1 through 3, said Operation C is a rotation of bits prior to the symbol mapping by a symbol mapping device and, consequently, can be found to be a cyclic rotation of bits in the amount of shift which is a multiple of the prescribed number

of successive bits that will be mapped into one symbol that corresponds to the frequency tone (sub-carrier) of OFDM. Thus, it is not especially difficult but rather possible to appropriately set the amount of shift of the cyclic shift of the Cited Invention to be as mentioned above.

No. 3 Allegations of the parties

(omitted)

No. 4 Court decision

1. The Claimed Invention is as stated in section 2 of No. 2 above, and there are no disputes between the parties with respect to the finding of the Cited Invention in the JPO Decision (section 3.(1) of No. 2 above). As such, in the following parts, this court will examine the common features and differences between the Claimed Invention and the Cited Invention and the issue of whether or not a person ordinarily skilled in the art could have easily arrived at each difference.

2. Common features and differences between the Claimed Invention and the Cited Invention

(1) Characteristic features of the Claimed Invention (Exhibit Ko 3)

A. The description of the Claimed Invention (including drawings; hereinafter referred to as the "Description"; Attachment 2) contains the following statements.

[Technical field]

[0001]

The present invention relates to wireless digital communications.

[Background art]

[0002]

A block diagram of a typical 802.11a/ g transmitter is shown in Figure 1. Such a transmitter is a Single-Input-Single-Output (SISO) system. Bits to be transmitted are applied to forward error correction (FEC) encoder 101 and then to interleaver 103. Output bits of interleaver 103 are grouped and mapped within a single plane by symbol mapper 105 (e.g., a QAM mapper) to form symbols. In the following IFFT operation 107, symbols are mapped to a set of subcarrier frequencies (i.e., frequency bins) and transformed to obtain a series of time samples. Cyclic extension operation 107 (equivalent to adding guard symbols) is performed to obtain a resulting OFDM symbol. Pulse shaping 109 and IQ modulation 111 are then performed to obtain RF output signal 113.

[0003]

A typical 802.11a/g system has a block interleaver (e.g., block interleaver 103) that may be described as one in which a first permutation is followed by a second permutation, using the following parameters: […]

[0007]

Following the strong market success of 802.11a/b/g wireless networking, the 802.11n working group was formed in 2003. Its charter prescribes the creation of a standard for high-throughput wireless LAN. In this proposed standard, the maximum data rate can go as high as 720 Mbps with more than twice the range as compared to 802.11a/b/g. The fundamental technology is called Multiple-Input-Multiple-Output (MIMO), which essentially uses multiple antennas to exploit path diversity in the wireless medium. When discussing a MIMO system, MxN means M transmit antennas and N receive antennas.

[Summary of the invention]

[Problem to be solved by the invention]

[0009]

It is desirable that 802.11n (MIMO) systems be upwardly compatible with at least 802.11a/g (SISO) systems. With respect to interleaving in particular, a need exists for interleaving mechanisms that achieve upward compatibility while addressing competing design objectives (e.g., compactness, low power consumption, and robustness of communications).

[Means to solve the problem]

[0010]

Generally speaking, the present invention provides interleavers and methods of interleaving that satisfy the need for upward compatibility while effectively addressing competing design objectives. According to one aspect of the invention, data is transmitted using a greater number of transmit antennas than the expected number of receive antennas. At least one pair of transmit antennas is formed, and multiple second data streams are formed from the first data stream. The successive bits in said first data stream are assigned to different streams of said second data streams. Block interleaving of multiple individual streams of said second data streams is individually performed. During the successive transmission intervals, by the use of a pair of transmit antennas, a pair of data symbols taken from the different streams of said second data streams is transmitted, followed by an equivalent transformed pair of data symbols. According to another aspect of the invention, data is transmitted using either a single antenna or multiple antennas. When transmitting data using a single antenna, block interleaving of data is performed employing the first interleaving method prior to transmission. When transmitting data using multiple antennas, multiple second data streams are formed from the first data stream and successive bits in said first data stream are assigned to different streams of said second data streams. Block interleaving of multiple streams of said second data streams is performed by employing an interleaving method substantially identical with said first interleaving method. [OPERATION C]. According to another aspect of the invention, data is transmitted using a greater number of transmit antennas than the expected number of receive antennas. A group of

transmit antennas is formed and multiple second data streams are formed from the first data stream. A second data stream is included in each of the antennas. Successive bits in said first data stream are assigned to different streams of the second data streams. Block interleaving of multiple individual streams of said second data streams is individually performed. During successive transmission intervals, individual non-zero symbols are output in turn for transmission from different streams of said antennas. As a result, during a given transmission interval, a non-zero symbol is assigned to only one antenna in the group of said antennas and zero symbols are assigned to other antennas in the group of said antennas.

[Mode for working the invention]

[0013]

For 802.11n, multiple spatial streams are required. For 802.11n systems to be upwardly compatible with 802.11a/g systems, an 802.11a/g interleaver must be present. The present approach is to create new interleavers based on the 802.11a/g interleaver. That is, the input bits are parsed into two streams, and on each stream an 802.11a/g interleaver is used.

[0014]

Referring now to Figure 3, a block diagram of a MIMO communication transmitter is shown. A single information stream is applied to bit parser 301. Depending on the transmission mode, the bit parser produces a single information stream or two separate information streams. In SISO mode, the bit parser sends the incoming information stream to upper branch 311 of interleaver 310. The upper branch of the interleaver may have the same structure as that of the interleaver shown in Figure 2. That is, block interleaver operation 313 is followed by significance index shuffler 315. In MIMO mode, the bit parser alternately outputs the bits of the incoming information stream to upper branch 311 of the interleaver and lower branch 312 of the interleaver, producing two separate information streams.

[0015]

The lower branch of the interleaver preferably includes blocks 314 and 316 corresponding to the upper branch of the interleaver. In addition, the lower branch of the interleaver includes block 316c (Operation C) and may optionally include block 316b (Operation B) or block 316a (Operation A).

[0016]

It is desirable to separate adjacent bits, now in different spatial streams, as far apart as possible in the frequency domain. One simple way of doing it is to cyclically rotate the output of block 316 in the multiples of N_CBPS (Operation C). […]

B. Characteristic features of the Claimed Invention

According to the statements in the Description identified in A. above, the characteristic features of the Claimed Invention can be recognized as follows.

(A) Background art ([0001] and [0002] above)

As a conventional wireless network standard, there exists the 802.11a/g standard, which is a Single-Input-Single-Output (SISO) system. Interleavers are used for a transmitter based on the 802.11a/g standard.

(B) Purpose ([0007] and [0009] above)

In order to create the 802.11n standard, which is a high-throughput standard superior to the conventional 802.11a/g standard, the 802.11n working group was formed in 2003.

The 802.11n standard is a standard of a system called Multiple-Input-Multiple-Output (MIMO), which essentially uses multiple antennas to exploit path diversity in the wireless medium and is prescribed to be desirable to be upwardly compatible with at least 802.11a/g (SISO) systems. With respect to interleaving in particular, a need exists for interleaving mechanisms that achieve upward compatibility while addressing competing design objectives (e.g., compactness, low power consumption, and robustness of communications).

(C) Structure ([0010] and [0013] through [0016] above)

The Claimed Invention is structured to transmit data by using either a single antenna or multiple antennas.

When transmitting data using a single antenna, data is interleaved by the first interleaving method (802.11a/g interleaver in the working example) prior to transmission.

When transmitting data using multiple antennas, multiple second data streams are formed from the first data stream and the interleaving of the multiple streams of said second data streams is performed by employing the interleaving method identical with said first interleaving method. One of the second data streams further includes block 316c (Operation C) after the abovementioned interleaving method and the output of block 316 is cyclically rotated by Operation C.

(D) Effect ([0009] and [0016] above)

It is possible to also correspond to the MIMO method, while achieving compactness, low power consumption and robustness of communications as well as upward compatibility with 802.11a/g.

Adjacent bits in different spatial streams can be separated as far apart as possible in the frequency domain.

(2) Characteristic features of the Cited Invention

A. The Cited Document contains the following statements (translations are based on Exhibit Otsu 12. However, obvious errors shall be corrected in accordance with Exhibit Ko 1).

(A) The impact of the space-time-frequency processing technology on the performance of the physical layer of the wireless LAN (IEEE802.11a/g) based on Orthogonal Frequency Division Multiplexing (OFDM) is examined. The space frequency code (SFC) of the two different

soft-input soft-output multiple antenna receivers is compared with an orthogonal space-time block code (OSTBC) and a single antenna system. (Lines 1 through 7 in the left column of page 2925)

(B) III. Processing technology

In this section, the single antenna method and the OSTBC-OFDM method (both are shown in Figures 2 and 4 due to space limitation) as well as the SFC-OFDM method (shown in Figures 3, 5 and 6) are discussed. (Lines 4 through 8 in the right column of page 2926)

(C) A. Single antenna method

The single antenna method/receive chain are shown in Figures 2 and 4 without OSTBC module (shown in grey). The mathematical formula of the input/output of the system for input in the bit level decoder is $Z=H_{eff}X+N_{eff}$ (formula 5). In this formula, Z means the received signal, H_{eff} means the communication channel, X means the input signal and N_{eff} means the added noise. Input symbol X is a QAM symbol and takes its value from finite alphabet constellations $X=\{X_1,X_2,\cdots,X_{|X|}\}$ obtained by the gray mapping of information bit $b=[b_0\cdots b_m\cdots b_M]$. Bit number M of one QAM symbol depends on the constellation size. The bit level decoder can be based on either the soft input or hard input. However, in the case of being used in an 802.11a system using a single antenna in AWGN channel, soft input decoding gives 2dB advantage to hard decoding [16]. (Lines 9 through 24 in the right column of page 2926)

(D) B. Pure space diversity-OSTBC-OFDM (Line 13 in the left column of page 2927)

(E) C. Diversity/Space multiplexer mode-SFC-OFDM

In this mode, the transmitter uses S-F bit interleaver (SFI) as the S-F encoder and delivers coded data which traverses space and frequency to improve the effective throughput of the system while maximizing the independence of the coded data [14]. The transmitter is shown in Figure 3.

In the simple SFI used, the coded and punctured data is multiplexed on two antenna streams with the odd bits from the coding bit stream being multiplexed on one of the antennas and the even bits being multiplexed on the other antenna. Following this, each stream is interleaved by an interleaver based on the 802.11a standard. This process secures independence over frequency. Then, in order to secure independence over space, cyclic shift is used for one of said two streams. An additional rotation improves SFI and increases interleaver gains. (Line 9 from the bottom in the left column of page 2927 to Line 5 in the right column of said page)

B. Characteristic features of the Cited Invention

The Cited Document is a paper in which a comparative study on the three methods, i.e. a single antenna method, the OSTBC-OFDM method and the SFC-OFDM method, is conducted with an aim to examine the impact of the space-time-frequency processing technology on the physical layer of a wireless LAN (802.11a/g) based on OFDM. In the JPO Decision, the

SFC-OFDM method among the abovementioned three methods has been identified as the Cited Invention.

According to the statements in the Cited Document found in A. above, the Cited Invention is a SFC-OFDM method which is a 2×2 MIMO OFDM system, (the fact that the SFC-OFDM method mentioned in the Cited Document is a 2×2 MIMO OFDM system is found based on the parts from line 2 from the bottom in the right column of page 2929 to line 2 in the left column of page 2930) and uses SFI, wherein, in the case of a simple SFI, the coded and punctured data is multiplexed on two antenna streams with the odd bits from the coding bit stream being multiplexed on one of the antennas and the even bits being multiplexed on the other antenna, and then each stream is interleaved by an interleaver based on the 802.11a standard, and further a cyclic shift is used for one of the two streams mentioned above.

The Cited Invention produces the effect of securing independence over space and increasing interleaver gains by adopting the structure mentioned above.

(3) Comparison between the Claimed Invention and the Cited Invention

A. According to the abovementioned findings (section 1 and 2(1) and (2) above), the following facts are found with respect to the comparison between the Claimed Invention and the Cited Invention.

(A) The Claimed Invention and the Cited Invention share the common feature that they are both a "method of transmitting data."

(B) The "multiple antennas" of the Cited Invention is equivalent to the "multiple antennas" of the Claimed Invention, and thus, the element of "when transmitting data using multiple antennas" of the Cited Invention can be found equivalent to the element of "when transmitting data using multiple antennas" of the Claimed Invention.

(C) The elements of "coded and punctured coding bit stream" and "two antenna streams" of the Cited Invention are equivalent to the elements of "first data stream" and "multiple second data streams" of the Claimed Invention, and thus the structure of "forming two antenna streams from the coded and punctured coding bit stream and assigning the successive bits of said coding bit stream to different streams of said two antenna streams" of the Cited Invention can be found to be equivalent to the structure of "forming multiple second data streams from the first data stream and assigning the successive bits of said first data stream to different streams of said second data streams" of the Claimed Invention.

(D) The element of "block interleaving of said two antenna streams" of the Cited Invention is equivalent to the element of "block interleaving of the multiple streams of said second data streams" of the Claimed Invention.

(E) In the Cited Invention, only one of the two antenna streams becomes subject to the reordering by the cyclic shift as a result of the behavior of "performing cyclic shift for one of

said two antenna streams," and thus the Cited Invention and the Claimed Invention share the common feature of "performing reordering to have one of said second data streams be reordered in comparison to another of said second data streams."

B. Based on the abovementioned findings, the common features and differences between the Claimed Invention and the Cited Invention can be found to be as follows.

(A) Common features

Both inventions are a method of transmitting data, comprising: when transmitting data using multiple antennas, forming multiple second data streams from the first data stream and assigning the successive bits of said first data stream to different streams of said second data streams; performing block interleaving of multiple streams of said second data streams by employing a predetermined interleaving method; and performing reordering to have one of said second data streams to be reordered in comparison to another of said second data streams.

(B) Difference A

While the Claimed Invention is a "method of transmitting data using either a single antenna or multiple antennas" and has the structure of "when transmitting data using a single antenna, performing block interleaving of said data employing the first interleaving method prior to transmission," the Cited Invention is a "method of transmitting data using multiple antennas" and contains no reference on the transmission of data using a single antenna.

(C) Difference B

While the "block interleaving of the multiple streams of said second data streams" is "performed by employing an interleaving method identical with said first interleaving method" in the Claimed Invention, the "block interleaving of said two antenna streams" is "performed using an interleaver based on the 802.11a standard" in the Cited Invention.

(D) Difference C

While the Claimed Invention has the structure of "grouping the bits into symbols during such block interleaving," the existence of such structure has not been clarified in the Cited Invention. Moreover, with respect to one of the common features, i.e. the method of "performing reordering to have one of said second data streams to be reordered in comparison to another of said second data streams," while it is realized by "performing a reordering of symbols such that symbols from one of said second data streams are reordered as compared to symbols of another of said second data streams" in the Claimed Invention, the specific processing of cyclic shift of the Cited Invention remains unclear.

C. In its decision, the JPO cited as the common feature between the Claimed Invention and the Cited Invention the structure of "performing the block interleaving of multiple streams of said second data streams by employing the same interleaving method as that employed at the time of transmitting data using a single antenna." However, the Cited Invention contains no reference

on the element of "when transmitting data using a single antenna" and "the first interleaving method" employed at that time. Thus, the determination of the common feature made in the JPO Decision is erroneous.

On the other hand, Differences A and C are identical with Differences 1 and 2 found in the JPO Decision, respectively. However, the JPO has failed to refer to Difference B and thus has erred in determining the differences in terms of overlooking such difference.

D. With respect to this, the defendant alleges that the JPO has not erred in making determinations on the common features and thus has not overlooked any difference based on the following premise: The interleaving method of an interleaver based on the 802.11a standard can be regarded as "the interleaving method employed at the time of transmitting data using a single antenna"; As such, the block interleaving using "an interleaver based on the 802.11a standard" that is performed at the time of transmitting data using multiple antennas in the Cited Invention can be recognized to be "the interleaving method identical with 'the interleaving method employed at the time of transmitting data using a single antenna' (in other words, the interleaving method employed in an interleaver which is assumed to transmit data using a single antenna (as with the case of the 'first interleaving method' of the Claimed Invention)). However, in light of the fact that the concept of "the interleaving method employed in an interleaver which is assumed to transmit data using a single antenna," which shows the nature of the method instead of whether or not it has been employed, and the concept of the "interleaving method employed at the time of transmitting data using a single data," which shows that the interleaving method has actually been employed instead of the nature of the interleaving method, should be understood as not being necessarily identical as a concept, the defendant's allegation in this regard cannot be accepted.

3. Whether or not a person ordinarily skilled in the art could have easily arrived at each difference

(1) There are no disputes between the parties with respect to the determination made in the JPO Decision on Difference 2 (the plaintiff has pointed out nothing including errors). Thus, in the following parts, this court will examine whether or not a person ordinarily skilled in the art could have easily arrived at Difference 1 and Difference B after identifying the relevant well-known arts.

(2) Relevant well-known arts

A. Exhibit Ko 2 Document

(A) Exhibit Ko 2 Document (Publication of Unexamined Patent Application No. 2004-194262) contains the following statements.

[0001]

[Field of art to which the invention pertains]

The present invention relates to a signal transmission system, signal transmission method and transmitter that are available in multiple input multiple output communication in wireless communications.

[0044]

Figure 3 is an explanatory drawing showing the structure and behavior of transmission signal generating means 4. In this embodiment, transmission signal generating means 4 is comprised of distributor 41 and coders 42 and 43, as shown in Figure 3.

[0045]

Distributor 41 is a module which acquires the transmission mode information showing the transmission mode transmitted from transmission mode decision means 3 and distributes the transmission signal (input) based on the acquired transmission mode.

[0046]

In the case of transmission mode 1, distributor 41 functions as a serial-parallel converter that divides an input single sequence into a double sequence as shown in Figure 3(a). On the other hand, in the case of transmission modes 2 through 5, distributor 41 functions as a selector that selects transmission antenna #1 or #2 as shown in Figure 3(b) or (c).

[0052]

In Table 1, transmission mode 1 conducts spatial multiplexing by using transmission antennas #1 and #2 and using QPSK modulation in each transmission antenna #1 or #2.

[0053]

Moreover, transmission modes 2 and 3 conduct single antenna transmission by using only transmission antenna #1 or #2 and using QPSK modulation in each transmission antenna #1 or #2.

[0054]

Transmission modes 4 and 5 conduct single antenna transmission by using only transmission antenna #1 or #2 and using 16QAM modulation in each transmission antenna #1 or #2.

(B) According to the statements found in (A) above, the art stated in Exhibit Ko 2 Document (hereinafter referred to as the "Exhibit Ko 2 Art") can be recognized as follows: "Exhibit Ko 2 Art is related to a signal transmission system, signal transmission method and transmitter that are available in multiple input multiple output communication (MIMO communication) in wireless communications, wherein transmission signal generating means 4 is comprised of distributor 41 and coders 42 and 43; distributor 41 is a module which distributes the transmission signal (input) based on the transmission mode; transmission mode 1 conducts spatial multiplexing using transmission antennas #1 and #2; transmission modes 2 through 5 conduct single antenna transmission using only transmission antenna #1 or #2; in the case of

transmission mode 1, distributor 41 functions as a serial-parallel converter which divides an input single sequence into a double sequence; and in the case of transmission modes 2 through 5, distributor 41 functions as a selector which selects either transmission antenna #1 or #2."

B. Statements in other documents

(A) Fuyuhiko Ikeda "Shinmai Shisutemu Kanrisha no tame no Nettowāku Q&A (Questions and Answers on Network for New System Administrator)" ("N+I NETWORK Vol. 4, No. 11" (published on November 1, 2004); Exhibit Otsu 3; hereinafter referred to as "Exhibit Otsu 3 Document").

"The key technology to support high-speed transmission technology of 802.11n is 'MIMO-OFDM (Multi Input Multi Output)'. While OFDM is a transmission technology based on frequency-division multiplexing that is also used in current wireless LANs, MIMO-OFDM realizes transfer of large quantities of data by the simultaneous use of multiple frequency channels and multiplexing of different communication data […]. Thus, wireless LAN devices that conduct transmitting and receiving must have multiple antennas.

According to the present proposals, there are two types of MIMO, i.e. 2×2 and 4×4. While communication is conducted by a band frequency of approximately 20MHz per one channel in the case of 2×2 MIMO, higher speed communication using a band frequency of 40MHz in all is possible in the case of 4×4 MIMO. The number of antennas is two and four respectively. In the proposal submitted by WWiSE, the aimed throughput is 135Mbps in the case of 2×2 MIMO and a maximum 540Mbps in the case of 4×4 MIMO. On the other hand, TGnSync aims to realize a 250Mbps throughput in the case of 2×2 MIMO and 500Mps in the case of 4×4 MIMO. In these draft standards, both MIMO have compatibility with the existing 802.11a/b/g." (Lines 25 through 42 in the left part of column A of page 147)

(B) Osamu Kagami, Kazuhiko Toyoda, Masahiro Umehira "Jisedai Hōmu Nettowāku Sābisu (Next Generation Home Network Service)" ("NTT Technology Journal Vol. 16, No. 11" (published on November 1, 2004; Exhibit Otsu 4; hereinafter referred to as "Exhibit Otsu 4 Document").

"IEEE 802 committee established TGn (Task Group n) last September to examine the use of next generation high-speed wireless LAN that realizes further speeding up of IEEE802.11g/a. TGn aims to secure backward compatibility with 5GHz frequency wireless LAN (IEEE802.11a) while achieving 100Mbit/s or higher throughput in MAC SAP (service access point of MAC layer).

Currently, proposals of technologies which can achieve the abovementioned development points that have been collected from the participants of TGn are evaluated and examined with an aim to complete the specification development in 2006. The MIMO technology mentioned above is also examined as the core technology of IEEE802.11n." (Lines 1 through 19 in the left

column of page 27)

(C) "Toshiba Review 2003 Vol. 58, No. 11" (published on November 1, 2003; Exhibit Otsu 5; hereinafter referred to as "Exhibit Otsu 5 Document").

"For the future, examination on the standard with further maximum transmission speed has been started. Such standard is called IEEE802.11n which is characterized by guaranteeing not slower than 100Mbps transmission speed at the application level and has backward compatibility with IEEE802.11a." (Lines 28 through 34 in the middle column of page 4)

(D) Publication of PCT International Application No. 2004/030265 (published on April 8, 2004; Exhibit Otsu 6; hereinafter referred to as "Exhibit Otsu 6 Document"; the translations are based on Publication of Japanese Translation of PCT International Application No. 2006-500864 (attached to Exhibit Otsu 6)).

"The existing IEEE802.11a standard adopts an effective method using orthogonal frequency-division multiplexing as well as the adaptive modulation and demodulation band. The system (note of the judgment: the original text reads 'The systems') is designed as a single-input single-output (SISO) system and essentially, a single transmitting and receiving antenna is adopted at each end of the line." (Lines 20 through 27 of page 1)

(E) Publication of PCT International Application No. 2004/051914 (published on June 17, 2004; Exhibit Otsu 7; hereinafter referred to as "Exhibit Otsu 7 Document"; the translations are based on Publication of Japanese Translation of PCT International Application No. 2006-509396 (attached to Exhibit Otsu 7)).

"Currently, the IEEE802.11a system can provide a maximum 54Mbps data transmission speed with respect to single-input single-output (SISO)." (Line 2 in the Abstract)

(F) Publication of Unexamined Patent Application No. 2004-135304 (published on April 30, 2004; Exhibit Otsu 8; hereinafter referred to as "Exhibit Otsu 8 Document").

[Problem to be solved by the invention]

[0010]

Communication systems using a MIMO antenna system are required to have signaling channel form that can cope with such system and to be backwardly compatible with the current SISO system as well. (Lines 10 through 14 of page 5)

[Best mode to work the invention]

[0012]

The present invention provides a method for transferring signaling information via the forward link and reverse link of a communication system having a MIMO antenna system. The signaling information transferred via a signaling channel is formalized so as to enable transfer of a relatively generous amount of information by the MIMO antenna system. Employing the method of the present invention and the MIMO antenna system, a relatively generous amount of

signaling information can be transferred for preparation for transmitting and/or receiving of traffic information. Specifically, the form of the signaling channel in the forward link provides an arrangement structure which enables the system device to effectively use the antenna element of the MIMO antenna system to improve the throughput of the communication system. In order to provide support in the communication system using a MIMO antenna system, the form of the reverse link signaling channel can be arbitrarily modified by one of the following three basic methods: [a] time division multiplexing of the reverse link signaling information; [b] provision of an additional channel to the reverse link signaling information; and [c] modulation of the reverse link information in a relatively high order modulation. Moreover, exclusive portions of available signals and traffic communication channels are allocated to various users who transmit information using the MIMO antenna system. The channel allocation information is included in the forward link signaling information in order to allocate available channels (traffic and/or signal) to specific users. One or more channels can be allocated to a specific user. To make these explanations more understandable, the method employed in the present invention will be stated in the context of a CDMA communication system using a 2×2 MIMO antenna system (which has two transmit antennas and two receive antennas (not shown in the figure)) whose forward link signaling channel is SPDCCH while the reverse link signaling channel is RACKCH and RCQICH. (Line 33 of page 5 through line 4 of page 6)

(G) Description of Published European Patent Application No. 1351414 (published on October 8, 2003; Exhibit Otsu 11 (translations are based on the attachment of said documentary evidence); hereinafter referred to as "Exhibit Otsu 11 Document").

"[0010] According to one of the modes of the present invention, a physical layer different from those of other devices can be set in some of the devices. A method which realizes a communication frame in a wireless network having multiple units of wireless equipment is disclosed. This method includes the formation of a polling frame which contains at least one bit in which the setting information of a physical layer which can designate the use of either the SISO antenna configuration or MIMO antenna configuration is coded. This method further includes the transmission of the polling frame to the receiving apparatus for composition by the receiving apparatus and the setting of the physical layer of the receiving apparatus in accordance with the setting information of the physical layer included in said polling frame. In this process, the polling frame is set to decide whether or not the receiving apparatus has information to return."

"[0020] The currently adopted 802.11 standard defines the structure of various frame types such as control frame, data frame and management frame. In the following explanations, various changes will be stated to have the 802.11 frame construction include PHY setting information (for example, MIMO and legacy SISO, etc.) when scheduling the communication between

wireless stations and/or access points. The preferable improvement mentioned below is made with respect to the existing frame construction to enable the use of the existing implementation to the extent possible, and as a result, the development time and costs can be minimized. Furthermore, the approach adopted in the preferred working mode using the existing frame type promotes backward compatibility. Application of such characteristics to 802.11 compliant devices requires some variations from the currently adopted standards. These variations are implemented in the following examples and relevant drawings. However, the following disclosure and scope of claims should be understood as not necessarily being limited to the context of 802.11."

C. In light of the statements mentioned above, the following facts can be found.

(A) According to Exhibit Otsu 6 Document and Exhibit Otsu 7 Document, it is well known that the 802.11a standard is a standard of SISO system using OFDM.

(B) According to Exhibit Otsu 3 Document and Exhibit Otsu 4 Document, it is well known that the 802.11n standard is a standard of a MIMO system.

(C) According to Exhibit Otsu 3 Document, Exhibit Otsu 4 Document and Exhibit Otsu 5 Document, it is well known that the 802.11n standard is backwardly compatible with the 802.11a standard.

(D) According to the facts mentioned in (A) through (C) above, it is well known that 802.11n, which is a standard of a MIMO system using OFDM, is backwardly compatible with 802.11a, which is a standard of a SISO system using OFDM.

(E) In Exhibit Otsu 8 Document, it is disclosed that a CDMA communication system using MIMO is backwardly compatible, in other words, has backward compatibility with a SISO system. Taking this fact and that mentioned in (D) above into account, it is well known to make a MIMO system in general to have backward compatibility with a SISO system.

(F) Exhibit Ko 2 Document contains a statement on a system available in MIMO communication wherein the transmission mode using multiple antennas and transmission mode using a single antenna are made switchable.

Exhibit Otsu 11 Document contains a statement that backward compatibility is promoted by including, in the 802.11 frame construction, the information as to which configuration to use, either the SISO antenna configuration (in other words, transmitting and receiving using a single antenna) or the MIMO antenna configuration (in other words, transmitting and receiving using multiple antennas).

Based on the well-known arts stated in (E) above and taking into consideration the abovementioned statements in Exhibit Ko 2 Document and Exhibit Otsu 11 Document, it is well known to structure the transmission using a single antenna and that using multiple antennas in a switchable manner as one of the modes to make a MIMO system backwardly compatible with a

SISO system.

(3) Regarding Difference 1

A. The SFC-OFDM method, which is the Cited Invention, has been presented for the purpose of evaluating the impact of SFC (space frequency code) on the physical layer of the 802.11a standard. In more detail, the Cited Invention is a 2×2 MIMO-OFDM system which transmits data using multiple antennas and improves the independence over space and interleaver gains when evaluated based on a comparison with the 802.11a system using a single antenna, which is a SISO system. Focusing on the fact that, in the Cited Invention, the data on the antenna stream is interleaved by an interleaver based on the 802.11a standard, the Cited Invention can be understood to have been created by improving the SISO system based on the 802.11a standard to transmit data by using multiple antennas as a MIMO system (2.(2) above).

Based on this understanding and in light of the fact that it is well known that 802.11n, which is a standard of the MIMO system, has backward compatibility with 802.11a, which is a standard of the SISO system ((2)C.(D) and (E) above), it should be said that there are sufficient motivations to make the Cited Invention, in which a MIMO system has been created by improving the SISO system based on 802.11a, have backward compatibility with the SISO system based on 802.11a. Moreover, taking into account that it is well known to make the transmission mode using multiple antennas and that using a single antenna switchable as a specific example of making a MIMO system backwardly compatible with a SISO system ((2)C.(F) above), it is found that a person ordinarily skilled in the art could have easily structured the Cited Invention to make the multiple antenna mode and single antenna mode switchable.

Therefore, it is found that a person ordinarily skilled in the art could have easily arrived at Difference 1.

B. With respect to this, the plaintiff alleges that there are no motivations to assume the case of transmitting data using a single antenna in the Cited Invention based on the premise that the achievement of backward compatibility in the Cited Invention can be considered to be equivalent to enabling data communication even in the case where the receiver only has a single antenna structure (section 1(3)B. of No. 3 above). However, the Cited Document contains no statements on backward compatibility nor is there any evidence indicating that the abovementioned premise pertaining to the plaintiff's allegation is right. Even if this premise is correct, taking into consideration the following facts, it should be said that there is no necessity to go so far as to throw out the abovementioned well-known structure to adopt the structure presented in the plaintiff's allegation: [a] it is shown that it is a well known structure to make the transmission using a single antenna and that using multiple antennas switchable as one of the modes of backward compatibility of a MIMO system with a SISO system ((2)C.(F) above); and

[b] it is technically obvious that the data transmitted by using a single antenna can be received by a single antenna.

The plaintiff also alleges that the determination made in the JPO Decision is erroneous based on the premise that when a person ordinarily skilled in the art of wireless digital communications intends to make the Cited Invention capable of transmitting data using a single antenna for the purpose of achieving backward compatibility, it is natural for said person to prepare the "Single Antenna Transmitter" structure stated in Figure 2 in the Cited Document and the "SFC-OFDM Transmitter" structure stated in Figure 3 in the Cited Document in parallel and to arrange the selector which selects either of the lines in front of the "Bit Encoder" of the two lines (section 1.(3)C. of No. 3 above). However, the allegation pertaining to the structure of the arrangement of the selector is questionable in the first place and moreover, even if such point is as alleged by the plaintiff, the Claimed Invention does not limit the relation between the "single antenna" and "multiple antennas" nor does it limit the element of "when transmitting data using a single antenna" to the structure using one of the "multiple antennas." As long as that is the case, it should be found that the process of preparing in parallel the "Single Antenna Transmitter" structure and "SFC-OFDM Transmitter" structure as alleged by the plaintiff is not included in the Claimed Invention.

Based on the abovementioned findings, the plaintiff's allegation in this regard cannot be accepted.

(4) Regarding Difference B

A. As stated in (3)A. above, the Cited Invention has been created as a MIMO system to transmit data using multiple antennas by improving the SISO system based on the 802.11a standard, and a person ordinarily skilled in the art could have easily introduced, based on well-known arts, a single antenna mode to the Cited Invention for the purpose of making the MIMO system backwardly compatible with the SISO system based on the 802.11a standard. At this time, the single antenna mode which is to be newly introduced to the Cited Invention must achieve backward compatibility with the 802.11a standard and thus it may be found obvious that an interleaving method based on the 802.11a standard must be adopted as the interleaving method.

In addition, the interleaving method employed in the multiple antenna mode of the Cited Invention is based on the 802.11a standard in the first place (2.(2) above).

As long as that is the case, it can be said that it is natural to make the interleaving method employed in a single antenna mode and that employed in a multiple antenna mode the same at the time of introducing a single antenna mode to the Cited Invention.

Therefore, it is found that a person ordinarily skilled in the art could have also easily arrived at Difference B.

As stated above, in its decision, the JPO overlooked Difference B. However, the JPO has

instructed that "in light of the fact that, in the 802.11a standard, data is transmitted using a single antenna, it is only natural to have the interleaving at the time of transmitting data using a single antenna performed by an interleaver based on the 802.11a standard." This instruction can be regarded as, in substance, having presented a determination to the same effect mentioned above.

B. With respect to this, the plaintiff alleges that the determination made in the JPO Decision that "in the 802.11a standard, data is transmitted using a single antenna" is an intentional and limited interpretation and thus the determination made in the JPO Decision based on such interpretation is erroneous. Although a MIMO system using the 802.11a standard interleaver had been developed prior to the priority date of the Application (Cited Document), such fact cannot lead to the conclusion that the interleaving method based on the 802.11a standard cannot be employed for the interleaving performed at the time of transmitting data using a single antenna. Originally, the 802.11a standard is a standard for SISO systems ((2)C.(A) above), and thus it should be said that there are no errors in the determinations made in the JPO Decision such that it is natural for a person ordinarily skilled in the art to use an interleaver based on the 802.11a standard as the interleaver for SISO systems.

Even if the other matters pointed out by the plaintiff are taken into consideration, the plaintiff's allegation in this regard cannot be accepted.

(5) Therefore, a person ordinarily skilled in the art could have easily arrived at both Differences 1 and B.

(4) Summary

As found above, although the JPO Decision contains errors in the determination of common features and differences, such errors do not affect its conclusion and thus, it should be concluded that the grounds for rescission alleged by the plaintiff lack legal basis.

5. Conclusion

Accordingly, the plaintiff's claims shall be dismissed for lacking legal basis and the judgment shall be rendered in the form of the main text.

Intellectual Property High Court, Third Division

Presiding judge: TSURUOKA Toshihiko

Judge: ŌNISHI Katsushige

Judge: SUGIURA Masaki