

Appeal Decision

Appeal No. 2020-1746

Appellant Samsung Electronics Co., Ltd.

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The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2016-557004, entitled "METHODS AND APPARATUS FOR SYNCHRONIZATION IN DEVICE-TO-DEVICE COMMUNICATION NETWORKS" [International Publication No. WO2015/137781 published on September 17, 2015, National Publication of International Patent Application No. 2017-510191 published on April 6, 2017, number of claims: 12] 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 present application was originally filed on March 16, 2015 as an international patent application (the claim of priority under the Paris Convention was received by the foreign receiving office on March 14, 2014 in the US, on July 25, 2014 in the US, on August 6, 2014 in the US, on November 19, 2014 in the US, on November 26, 2014 in the US, and on March 6, 2015 in the US). The history of the procedures thereof is as follows.

Dated December 25, 2018 : Notice of reasons for refusal

April 3, 2019	: Submission of Written opinion and Written amendment
dated September 30, 2019	: Examiner's decision of refusal
February 7, 2020	: Appeal against the examiner's decision of refusal
dated September 16, 2020	: Notice of reasons for refusal (the body, final)
November 25, 2020	: Submission of Written opinion and Written amendment

No. 2 Outline of the examiner's decision

The outline of the examiner's decision (the examiner's decision of refusal dated September 30, 2019) is as follows.

The inventions according to Claims 1 to 12 of the present application are identical with inventions described in the specification, the scope of claims, or drawings originally attached to an application of the following Patent Application 1, which is a patent application filed before the filing of the present application and for which the gazette containing the patent was issued or the application was laid open after the filing of the application, and furthermore, the inventor of the application is not identical with a person who made the above invention relating to the patent application filed before the filing of the present application, and the Applicant is not identical with an applicant of the above patent application at the time of the filing of the application. Therefore, the Appellant should not be granted a patent under the provisions of Article 29-2 of the Patent Act.

Patent Application 1. Japanese Patent Application No. 2014-14915 (International publication No. 2015/046264)

No. 3 Outline of reasons for refusal by the body

The outline of the reasons for refusal by the body dated September 16, 2020 is as follows.

Reason 1. (Requirements for support) In this application, recitations of Claims 2, 5, 6, 8, 11, and 12 of the scope of claims do not satisfy the requirements stipulated in Article 36(6)(i) of the Patent Act.

Reason 2. (Clarity) In this application, recitations of Claims 2, 5, 6, 8, 11, and 12 of the scope of claims do not satisfy the requirements stipulated in Article 36(6)(ii) of the Patent Act.

No. 4 The Invention

The inventions according to Claims 1 to 12 of the present application (hereinafter referred to as "Invention 1" to "Invention 12"), which are inventions specified by the matters recited in Claims 1 to 12 of the scope of claims amended by the written amendment submitted on November 25, 2020, are as follows.

"[Claim 1]

A method for a first UE to communicate with a second UE comprising:
a step of receiving a first sync signal from a third UE;
a step of transmitting information indicating whether the first UE is in coverage or out of coverage of a serving network to the second UE; and
a step of transmitting a second sync signal to the second UE, wherein the second sync signal is based on the first sync signal, and when the third UE is selected as a reference for synchronization, the information indicates that the first UE is out of coverage of the serving network.

[Claim 2]

The method as set forth in Claim 1, wherein when the second sync signal is generated, replacing the first sync signal, based on a sync signal received from a base station, the information indicates that the first UE is in coverage of the serving network.

[Claim 3]

The method as set forth in Claim 1, wherein when other UEs or the base station is not selected as a reference for synchronization, the information indicates that the first UE is out of coverage of the serving network.

[Claim 4]

A method for a second UE to communicate with a first UE comprising:
a step of receiving first information indicating whether the first UE is in coverage or out of coverage of a serving network from the first UE;
a step of receiving a first sync signal from the first UE;
a step of transmitting second information indicating whether the second UE is in coverage or out of coverage of the serving network to a fourth UE; and
a step of transmitting a second sync signal to the fourth UE on the basis of the first sync signal, wherein when the first UE is selected as a reference for synchronization, the second information indicates that the second UE is out of coverage of the serving network.

[Claim 5]

The method as set forth in Claim 4, wherein the first information indicates that the first UE is out of coverage of the serving network.

[Claim 6]

The method as set forth in Claim 4, wherein when the second sync signal transmitted by the second UE is based on information from a base station, the second information indicates that the second UE is in coverage of the serving network.

[Claim 7]

A first UE which communicates with a second UE, the first UE comprising:
a transceiver; and
a processor connected to the transceiver, and configured to receive a first sync signal from a third UE,
transmit information indicating whether the first UE is in coverage or out of coverage of a serving network to the second UE, and
transmit a second sync signal to the second UE, wherein
the second sync signal is based on the first sync signal, and
when the third UE is selected as a reference for synchronization, the information indicates that the first UE is out of coverage of the serving network.

[Claim 8]

The first UE as set forth in Claim 7, wherein when the second sync signal is generated, replacing the first sync signal, based on a sync signal received from a base station, the information indicates that the first UE is in coverage of the serving network.

[Claim 9]

The first UE as set forth in Claim 7, wherein when other UEs or the base station is not selected as a reference for synchronization, the information indicates that the first UE is out of coverage of the serving network.

[Claim 10]

A second UE which communicates with a first UE, the second UE comprising:
a transceiver; and
a processor connected to the transceiver and employing a method comprising:
a step of receiving first information indicating whether the first UE is in coverage or out of coverage of a serving network from the first UE;
a step of receiving a first sync signal from the first UE;
a step of transmitting second information indicating whether the second UE is in coverage or out of coverage of the serving network to a fourth UE; and
a step of transmitting a second sync signal to the fourth UE on the basis of the first sync signal, wherein

when the first UE is selected as a reference for synchronization, the second information indicates that the second UE is out of coverage of the serving network.

[Claim 11]

The second UE as set forth in Claim 10, wherein the first information indicates that the first UE is out of coverage of the serving network.

[Claim 12]

The second UE as set forth in Claim 10, wherein when the second sync signal transmitted by the second UE is based on information from a base station, the second information indicates that the second UE is in coverage of the serving network."

No. 5 Prior invention

1. Description of the specification, etc.

The following matters are described with drawings in the specification, the scope of claims, and drawings (hereinafter referred to as "the prior application specification, etc.") originally attached to the application of Japanese Patent Application No. 2014-14915, which is a patent application cited in the reasons for refusal stated in the examiner's decision and filed before the priority date of the present application, which is a basis of priority claim under the provisions of Article 41(1) of the Patent Act, and which is assumed to have been published after the priority date of the present application under the provisions of Article 41(3) of the Patent Act which is applied mutatis mutandis pursuant to Article 184-15(2) of the Patent Act (See the brochure of International Publication No. 2015/046264)

(The underlines were added by the body.)

(1) "[0051]

As illustrated in FIG. 6, on the inside of the coverage, the eNB 200 serves as a D2D synchronization source. In the first embodiment, the D2D synchronization source refers to a node transmitting a D2D synchronization signal (synchronization source). In addition, a D2D un-synchronization source refers to a node performing synchronization with the D2D synchronization source without transmitting a D2D synchronization signal (Un-synchronization source)."

(2) "[0069]

As illustrated in FIG. 7, in the initial state, each of the UEs 100-1 to 100-3 serves as a D2D synchronization source and transmits broadcast synchronization information. In addition, the UEs 100-1 to 100-3 transmit their respective pieces of priority

information with the pieces of priority information of each UE 100 included in the broadcast synchronization information.

[0070]

The priority information of the UE 100-1 is 'Priority 10', the priority information of the UE 100-2 is 'Priority 1', and the priority information of the UE 100-3 is 'Priority 5'. The UE 100-4 receives the broadcast synchronization information from each of the UEs 100-1 to 100-3.

[0071]

The UE 100-4 compares the respective pieces of priority information of the UEs 100-1 to 100-3 with one another, and selects the UE 100 with the highest priority. Since the priority of the UE 100-1 with 'Priority 10' is the highest, the UE 100-4 selects the UE 100-1, and sets the UE 100-1 as a D2D synchronization source of the UE 100 itself. In addition, in this process, the priority information of the UE 100-4 is not considered.

[0072]

In this case, the UE 100-4 rewrites D2D resource information stored by the UE 100 itself, using D2D resource information included in broadcast synchronization information of the UE 100-1. The UE 100-4 performs discovery (and D2D communication) according to the D2D resource information included in the broadcast synchronization information of the UE 100-1.

[0073]

In addition, the UEs 100-1 and 100-4 form one synchronization cluster, and the UE 100-1 serves as a synchronization source UE (synchronization cluster head, control UE) in the synchronization cluster."

(3) "[0075]

(2) Priority Information

The priority information of the UE 100 is based on at least one of the specification of the UE 100, the movement state of the UE 100, and the reliability of D2D resource information stored in a storage. More specifically, for deciding priority information, at least one of the following parameters is used.

[0076]

· Whether a UE 100 is inside the coverage: Higher priority is given to a UE 100 inside the coverage as compared with a UE 100 outside the coverage.

[0077]

· The time when D2D resource information is acquired from a D2D

synchronization source inside the coverage (the eNB 200, the UE 100 inside the coverage): As an elapsed time from the time when D2D resource information is acquired from a D2D synchronization source inside the coverage is longer, lower priority is given."

(4) "[0085]

(3) D2D Resource Information Rewrite Determination

The UE 100 executes D2D resource information rewrite determination at one or more timings of the following timings.

[0086]

· A timing at which a UE 100 receives broadcast synchronization information (D2D synchronization signal and D2D resource information) from the eNB 200; i.e., a timing at which the UE 100 comes inside the coverage."

(5) "[0105]

[Second embodiment]

The second embodiment will be described mainly based on a difference from the first embodiment.

[0106]

(Multi-Hop Synchronization Scheme)

As described above, the UE 100 serving as a D2D synchronization source; i.e., a synchronization cluster head (SCH) UE 100, provides information necessary for executing synchronization, discovery, and D2D communication, using the D2DSS and the PD2DSCH. By receiving the D2DSS transmitted from the D2D synchronization source (SCH), the UE 100 acquires time and frequency synchronization references. Furthermore, when executing discovery and D2D communication, the UE 100 needs to recognize a resource used by another UE 100 located close to the UE 100. Thus, radio resources (resource pools) for discovery and D2D communication need to be provided. In addition, since the UE 100 may receive a plurality of D2DSSs transmitted from different SCHs, SCH-related information should be transmitted. As the SCH-related information, a D2D synchronization source identifier and a D2D synchronization source type are considered. These types of information should be notified from D2D synchronization source using the D2DSS, the PD2DSCH, and other means. Table 1 lists pieces of information to be provided by the D2D synchronization source.

[0107]

[Table 1]

• Time/frequency synchronization reference
• Bandwidth
• SFN information
• D2D resource pool
➢ Discovery resource pool
➢ Communication resource pool
• Synchronization source 関連情報
➢ PD2DSCH 送信周期及びオフセット
➢ Synchronization source type
◇ In-Coverage Synchronization source
◇ Synchronization Cluster Head (SCH)
◇ (Out-of-Coverage) Synchronization source
➢ Synchronization source ID
➢ Number of hop

関連情報 related information

PD2DSCH 送信周期及びオフセット PD2DSCH transmission periodicity and offset

"

(6) "[0108]

In the second embodiment, a case of introducing a multi-hop synchronization scheme will be described. The multi-hop synchronization scheme is a scheme in which the UE 100 multi-hop transfers broadcast synchronization information (D2DSS and PD2DSCH) acquired from the eNB 200 or a SCH UE 100.

[0109]

FIG. 10 is a diagram illustrating the multi-hop synchronization scheme in an out-of-coverage scenario. As illustrated in FIG. 10, in each of a plurality of synchronization clusters 1 to 3, broadcast synchronization information transmitted by a SCH UE is transferred by another UE in a corresponding synchronization cluster. As a result, even a UE that cannot directly receive broadcast synchronization information from a SCH UE can be synchronized with UEs under the SCH UE, and execute discovery and D2D communication.

[0110]

FIG. 11 is a diagram illustrating the multi-hop synchronization scheme in a partial-coverage scenario. As illustrated in FIG. 11, broadcast synchronization information transmitted by an eNB 1 is transferred by a UE inside the coverage. As a result, even an out-of-coverage UE that cannot directly receive broadcast synchronization information from the eNB 1 can be synchronized with the UE under the eNB 1, and execute discovery and D2D communication.

[0111]

(Operation According to Second Embodiment)

(1) Operation Overview

FIG. 12 is a diagram illustrating a transfer method of broadcast synchronization information (D2DSS and PD2DSCH) in the multi-hop synchronization scheme.

[0112] As illustrated in FIG. 12, when broadcast synchronization information is transferred, interference is considered to occur between broadcast synchronization information before transfer and broadcast synchronization information after transfer. In FIG. 12, interference occurs between broadcast synchronization information (hop 1) transmitted by the UE 100-1 serving as a D2D synchronization source (SCH) and broadcast synchronization information (hop 2) transferred by the UE 100-2. In addition, interference occurs between the broadcast synchronization information (hop 2) transferred by the UE 100-2 and broadcast synchronization information (hop 3) transferred by the UE 100-3. It is therefore preferable to introduce a transfer method that gives consideration to interference.

[0113]

The transfer method of broadcast synchronization information according to the second embodiment will be described below. Initially, the description will be given with the focus placed on the UE 100-2.

[0114]

First, the UE 100-2 receives the broadcast synchronization information (hop 1) multi-hop transferred from the D2D synchronization source (SCH UE 100-1).

[0115]

Secondly, the UE 100-2 transfers transmission broadcast synchronization information (hop 2) corresponding to the received broadcast synchronization information (hop 1), to another UE 100-3. Here, the UE 100-2 applies a transmission parameter different from a transmission parameter applied to the received broadcast synchronization information (hop 1), to the transmission broadcast synchronization information (hop 2). The transmission parameter is at least either one of a signal sequence or time and frequency resources.

[0116]

More specifically, the transmission parameter in broadcast synchronization information is associated with the hop number of the broadcast synchronization information from the D2D synchronization source (SCH UE 100-1). In addition, the broadcast synchronization information (hop 1) received by the UE 100-2 includes information about the hop number from the D2D synchronization source. The UE 100-2 applies a transmission parameter corresponding to the hop number, to the

transmission broadcast synchronization information (hop 2).

[0117]

The UE 100-3 also performs operations similar to those performed by the UE 100-2. More specifically, the broadcast synchronization information (hop 2) received by the UE 100-3 includes information about the hop number from D2D synchronization source. The UE 100-2 applies a transmission parameter corresponding to the hop number, to the transmission broadcast synchronization information (hop 3).

[0118]

(2) D2DSS

Next, description will be given of a specific example of a transmission parameter in broadcast synchronization information that is to be applied to a D2DSS.

[0119]

One method for suppressing the interference between D2DSSs is to change a signal sequence (an orthogonal sequence) of a D2DSS for each hop, for example. Examples of the signal sequence include a Zadoff Chu sequence and an M sequence. With this configuration, signal sequences of D2DSSs transmitted by the UEs 100-1 to 100-3 can be made different from one another. Thus, D2DSSs can be multiplexed by code division multiplexing.

[0120]

(3) PD2DSCH

Next, description will be given of a specific example of a transmission parameter in broadcast synchronization information that is to be applied to a PD2DSCH.

[0121]

A method for suppressing the interference between PD2DSCHs is to change a transmission resource of a PD2DSCH for each hop. FIG. 13 is a diagram illustrating a method for suppressing the interference between PD2DSCHs.

[0122]

As illustrated in FIG. 13, the offset of the transmission periodicity of PD2DSCHs is changed according to the hop number. For example, the transmission periodicity of PD2DSCHs is set to be an integer multiple of the transmission periodicity of D2DSSs, and the offset varying according to each hop number is given to the transmission timings of PD2DSCHs. With this configuration, PD2DSCH transmission timings of the UEs 100-1 to 100-3 can be made different from one another. Thus, D2DSSs can be multiplexed by time division multiplexing."

2. Prior invention

Considering the above descriptions of the prior application specification, etc. and common general technical knowledge in this field, the following matters are found.

(1) As described in "1." (2), the specification includes the following descriptions: "the UEs 100-1 to 100-3 transmit their respective pieces of priority information with the pieces of priority information of each UE 100 included in the broadcast synchronization information" [0069]; "The UE 100-4 receives the broadcast synchronization information from each of the UEs 100-1 to 100-3" [0070]; "The UE 100-4 compares the respective pieces of priority information of the UEs 100-1 to 100-3 with one another, and selects the UE 100 with the highest priority" [0071]; "The UE 100-4 performs discovery (and D2D communication) according to the D2D resource information included in the broadcast synchronization information of the UE 100-1" [0072]; "the UEs 100-1 and 100-4 form one synchronization cluster, and the UE 100-1 serves as a synchronization source UE (synchronization cluster head, control UE) in the synchronization cluster" [0073]. According to the above descriptions, it can be said that the UE 100-4 which has received a broadcast synchronization signal selects one UE 100-1 out of the UEs 100-1 to 100-3 which transmitted the broadcast synchronization signal, to perform D2D communication with the selected UE 100-1 which has transmitted the broadcast synchronization signal. Accordingly, it can be said that the prior application specification, etc. describes the following matter: "A UE which has received a broadcast synchronization signal selects one UE out of UEs which transmitted the broadcast synchronization signal, and the selected UE which transmitted the broadcast synchronization signal can communicate with the UE which has received the broadcast synchronization signal".

(2) According to the description, "First, the UE 100-2 receives the broadcast synchronization information (hop 1) multi-hop transferred from the D2D synchronization source (SCH UE 100-1)" [0114], in "1." (6), the "UE 100-2" in the prior application specification, etc. is to "receive broadcast synchronization information (hop 1) from the UE 100-1".

(3) As described in "1." (2), the specification includes the description, "the UEs 100-1 to 100-3 transmit their respective pieces of priority information with each pieces of priority information of the UE 100 included in the broadcast synchronization information" [0069]. As described in "1." (3), the specification includes the following descriptions: "Priority Information The priority information of the UE 100 is based on at

least one of the specification of the UE 100, the movement state of the UE 100, and the reliability of D2D resource information stored in a storage. More specifically, for deciding priority information, at least one of the following parameters is used" [0075]; "Whether a UE 100 is inside the coverage: Higher priority is given to a UE 100 inside the coverage as compared with a UE 100 outside the coverage" [0076]. Accordingly, the "UE 100-1" to the "UE 100-3" in the prior application specification, etc. are to "transmit priority information determined based on whether the UE is inside the coverage with the priority information included in the broadcast synchronization information".

(4) As described in "1." (6), the specification includes the following descriptions: "First, the UE 100-2 receives the broadcast synchronization information (hop 1) multi-hop transferred from the D2D synchronization source (SCH UE 100-1)" [0114]; "Secondly, the UE 100-2 transfers transmission broadcast synchronization information (hop 2) corresponding to the received broadcast synchronization information (hop 1), to another UE 100-3" [0115]. Accordingly, the "UE100-2" in the prior application specification, etc. is to "transfer broadcast synchronization information (hop 2) to another UE 100-3", and the "broadcast synchronization information (hop 2)" "corresponds to the broadcast synchronization information (hop 1)".

(5) It can be said that the prior application specification, etc. describes the matter, "a UE which has received a broadcast synchronization signal selects one UE out of UEs which transmitted the broadcast synchronization signal, and the selected UE which transmitted the broadcast synchronization signal can communicate with the UE which has received the broadcast synchronization signal" as described in (1), and the matter that the "UE 100-2" "transfers broadcast synchronization information (hop 2) to another UE 100-3" as described in (4). Accordingly, it can be said that "when the UE 100-3 selects the UE 100-2, the UE 100-2 can communicate with the UE 100-3", in the prior application specification, etc.

(6) It can be said that the prior application specification, etc. describes the matter that the "UE 100-2" "transmits priority information determined based on whether the UE is inside the coverage with the priority information included in the broadcast synchronization information" as described in (3), and the matter that the "UE 100-2" "transfers broadcast synchronization information (hop 2) to another UE 100-3" as described in (4). Accordingly, it can be said that the "UE 100-2 transfers priority

information determined based on whether the UE is inside the coverage with the priority information included in the broadcast synchronization information (hop 2) to the UE 100-3" in the prior application specification, etc.

(7) As described in "1." (6), the specification includes the following description: "The UE 100-3 also performs operations similar to those performed by the UE 100-2. More specifically, the broadcast synchronization information (hop 2) received by the UE 100-3 includes information about the hop number from the D2D synchronization source. The UE 100-2 applies a transmission parameter corresponding to the hop number, to the transmission broadcast synchronization information (hop 3)" [0117]. Considering the operation of the "UE 100-2" described in (3), (4), and (6), it can be said that "the UE 100-3 which has received broadcast synchronization information (hop 2) transfers priority information determined based on whether the UE is inside the coverage with the priority information included in the broadcast synchronization information (hop 3) to another UE", and that the "broadcast synchronization information (hop 3)" "corresponds to the broadcast synchronization information (hop 2)", in the prior application specification, etc.

Therefore, it is recognized that the above prior application specification, etc. describes the following invention (hereinafter referred to as "Prior invention").

"A method for allowing a UE 100-2 and a UE 100-3 to communicate with each other when the UE 100-3 selects the UE 100-2, the UE 100-2 being configured to
receive broadcast synchronization information (hop 1) from UE 100-1,
the UE 100-2 transferring priority information determined based on whether the UE is inside the coverage with the priority information included in broadcast synchronization information (hop 2) to the UE 100-3, and
the UE 100-3 having received the broadcast synchronization information (hop 2) transferring priority information determined based on whether the UE is inside the coverage with the priority information included in broadcast synchronization information (hop 3) to another UE, wherein
the broadcast synchronization information (hop 2) corresponds to the broadcast synchronization information (hop 1), and
the broadcast synchronization information (hop 3) corresponds to the broadcast synchronization information (hop 2)."

No. 6 Comparison / Judgment

1. Regarding Invention 1

Comparing the Invention 1 with the Prior Invention, the following matters are found.

(1) The "UE 100-2" and the "UE 100-3" in the Prior invention correspond to the "first UE" and the "second UE" in Invention 1, respectively. Regarding the matter in the Prior invention, "allowing a UE 100-2 and a UE 100-3 to communicate with each other", from the viewpoint of the UE 100-2, it is considered that the UE 100-2 communicates with the UE 100-3. Thus, the above matter in the Prior invention corresponds to the matter in Invention 1, "a first UE to communicate with a second UE".

(2) The "UE 100-1" and the "broadcast synchronization information (hop 1)" in the Prior Invention correspond to the "third UE" and the "first sync signal" in Invention 1, respectively. The matter that the "UE 100-2" "receives broadcast synchronization information (hop 1) from UE 100-1" in the Prior Invention corresponds to the "step of receiving a first sync signal from a third UE" in Invention 1.

(3) The "broadcast synchronization information (hop 2)" in the Prior Invention corresponds to the "second sync signal" in Invention 1. It is obvious that "transmission" is necessary for "transfer" in communication technology. Thus, the matter that the "UE 100-2" "transfers" the "broadcast synchronization information (hop 2)" to the "UE 100-3" in the Prior Invention corresponds to the "step of transmitting a second sync signal to the second UE" in Invention 1.

(4) The "broadcast synchronization information (hop 2)" in the Prior Invention "corresponds to the broadcast synchronization information (hop 1)" and "transfers to the UE 100-3". Thus, it can be said that the "broadcast synchronization information (hop 2)" is based on the "broadcast synchronization information (hop 1)". Accordingly, the matter that the "broadcast synchronization information (hop 2)" "corresponds to the broadcast synchronization information (hop 1)" and "transfers to the UE 100-3" in the Prior Invention corresponds to the matter in Invention 1, "the second sync signal is based on the first sync signal".

Taken together, Invention 1 and the Prior Invention have the following corresponding feature and different feature.

<Corresponding Feature>

"A method for a first UE to communicate with a second UE comprising:
a step of receiving a first sync signal from a third UE; and
a step of transmitting a second sync signal to the second UE, wherein
the second sync signal is based on the first sync signal."

<Different Feature>

Invention 1 includes "a step of transmitting information indicating whether the first UE is in coverage or out of coverage of a serving network to the second UE" and "when the third UE is selected as a reference for synchronization, the information indicates that the first UE is out of coverage of the serving network". The Prior Invention is configured so that "the UE 100-2 transmits priority information determined based on whether the UE is inside the coverage with the priority information of the UE 100 included in broadcast synchronization information (hop 2) to the UE 100-3", and does not specify the above matters specifying the invention.

The above-mentioned Different Feature is examined below.

Regarding the matters specifying Invention 1 relating to the above Different Feature that Invention 1 includes "a step of transmitting information indicating whether the first UE is in coverage or out of coverage of a serving network to the second UE" and "when the third UE is selected as a reference for synchronization, the information indicates that the first UE is out of coverage of the serving network", the "priority information" included in the "broadcast synchronization information (hop 2)" in the Prior Invention is "determined based on whether the UE 100-2 is inside the coverage", but it is not information which indicates whether the UE is in coverage or out of coverage, or information that indicates that the UE 200-2 is out of coverage of the serving network when the UE 100-1 is selected as a reference for synchronization. Thus, it cannot be said that Invention 1 is identical with the Prior Invention. The matters specifying the invention relating to the different feature are not a very minor difference in the means for solving the problem. Thus, it cannot be said that Invention 1 and the Prior Invention are substantially the same.

As described in "No. 4" "1." (5) and (6), the prior application specification, etc. includes the following descriptions: "the UE 100 serving as a D2D synchronization source; i.e., a synchronization cluster head (SCH) UE 100 provides information necessary for executing synchronization, discovery, and D2D communication, using the D2DSS and the PD2DSCH. ... (Omitted) ... since the UE 100 may receive a plurality of D2DSSs transmitted from different SCHs, SCH-related information should be

transmitted. As the SCH-related information, a D2D synchronization source identifier and a D2D synchronization source type are considered. The D2D synchronization source should notify a UE 100 of these types of information using the D2DSS, the PD2DSCH, and other means. Table 1 lists pieces of information to be provided by the D2D synchronization source." [0106]; "broadcast synchronization information (D2DSS and PD2DSCH)" [0108]. Table 1 shows "In-Coverage Synchronization source" and "(Out-of-Coverage) Synchronization source" as "synchronization source type". In light of the above, it can be said that the prior application specification, etc. describes that a synchronization cluster head (SCH) UE transmits information indicating whether the UE is in coverage or out of coverage with the information included in broadcast synchronization information. However, there is no description or indication about a matter that a UE having received broadcast synchronization information from the synchronization cluster head (SCH) UE transmits "information indicating whether the UE is in coverage or out of coverage" as broadcast synchronization information to another UE. There is also no description or indication about a matter that the information indicates that the UE is out of coverage of the serving network when the synchronization cluster head (SCH) UE is selected as a reference for synchronization. Therefore, even after considering the above descriptions of the prior application specification, etc. it cannot be said that Invention 1 and the Prior Invention are the same.

2. Regarding Inventions 2, 3, and 7 to 9

Invention 7 is an invention of a device (first UE) corresponding to Invention 1 which is an invention of a method, and includes, as with Invention 1, the following matters specifying the invention: "transmits information indicating whether the first UE is in coverage or out of coverage of a serving network to the second UE", and "when the third UE is selected as a reference for synchronization, the information indicates that the first UE is out of coverage of the serving network". Accordingly, it cannot be said that Invention 7 is identical with the Prior Invention, for the same reason as for Invention 1.

Inventions 2 and 3 includes all the matters specifying the invention of Invention 1. Inventions 8 and 9 includes all the matters specifying the invention of Invention 7. Accordingly, for the same reason as for Invention 1, it cannot be said that Inventions 2, 3, 8, and 9 are identical with the Prior Invention.

3. Regarding Invention 4

Comparing Invention 4 with the Prior Invention, the following matters are found.

(1) The "UE 100-2" and the "UE 100-3" in the Prior Invention correspond to the "first

UE" and the "second UE" in Invention 4, respectively. Regarding the matter in the Prior Invention, "allowing a UE 100-2 and a UE 100-3 to communicate with each other", from the viewpoint of the UE 100-3, it is considered that the UE 100-2 communicates with the UE 100-3. Thus, the above matter in the Prior Invention corresponds to the matter in Invention 4, "a second UE to communicate with a first UE".

(2) The "broadcast synchronization information (hop 2)" in the Prior Invention corresponds to the "first sync signal" in Invention 4. The matter in the Prior Invention that the "UE 100-3" "receives broadcast synchronization information (hop 2)" corresponds to the "step of receiving a first sync signal from the first UE" in Invention 4.

(3) The "another UE" and the "broadcast synchronization information (hop 3)" in the Prior Invention correspond to the "fourth UE" and the "second sync signal" in Invention 4, respectively. The "broadcast synchronization information (hop 3)" in the Prior Invention "corresponds to the broadcast synchronization information (hop 2)" and "transfers to another UE". It is obvious that "transmission" is necessary for "transfer" in communication technology. Thus, it can be said that the "broadcast synchronization information (hop 3)" is transmitted to "another UE" on the basis of the "broadcast synchronization information (hop 2)". Accordingly, the matter in the Prior Invention that the "UE 100-3" "transfers" the "broadcast synchronization information (hop 3)" to "another UE", the "broadcast synchronization information (hop 3)" "corresponding to the broadcast synchronization information (hop 2)", corresponds to the "step of transmitting a second sync signal to the fourth UE on the basis of the first sync signal" in Invention 4.

Taken together, Invention 4 and the Prior Invention have the following corresponding feature and different features.

<Corresponding Feature>

" A method for a second UE to communicate with a first UE, comprising:
a step of receiving a first sync signal from the first UE; and
a step of transmitting a second sync signal to a fourth UE on the basis of the first sync signal."

<Different Feature 1>

Invention 4 includes "a step of receiving first information indicating whether the

first UE is in coverage or out of coverage of a serving network from the first UE". The Prior Invention is configured so that "the UE 100-2 transmits priority information determined based on whether the UE is inside the coverage with the priority information included in broadcast synchronization information (hop 2) to the UE 100-3" which "receives the broadcast synchronization information (hop 2)", and does not specify the above matters specifying the invention.

<Different Feature 2>

Invention 4 includes "a step of transmitting second information indicating whether the second UE is in coverage or out of coverage of the serving network to a fourth UE" and "when the first UE is selected as a reference for synchronization, the second information indicates that the second UE is out of coverage of the serving network". The Prior Invention is configured so that "the UE 100-3 transmits priority information determined based on whether the UE is inside the coverage with the priority information included in broadcast synchronization information (hop 3) to another UE", and does not specify the above matters specifying the invention.

In view of the case, Different Feature 2 is examined first.

Regarding the matter specifying Invention 4 relating to the above Different Feature that Invention 4 includes "a step of transmitting second information indicating whether the second UE is in coverage or out of coverage of the serving network to a fourth UE" and "when the first UE is selected as a reference for synchronization, the second information indicates that the second UE is out of coverage of the serving network", the "priority information" included in the "broadcast synchronization information (hop 3)" in the Prior Invention is "determined based on whether the UE 100-3 is inside the coverage", but it is not information which indicates whether the UE is in coverage or out of coverage, or information that indicates that the UE 200-3 is out of coverage of the serving network when the UE 100-2 is selected as a reference for synchronization. Thus, it cannot be said that Invention 4 is identical with the Prior Invention. The matters specifying the invention relating to the different feature are not a very minor difference in the means for solving the problem. Thus, it cannot be said that Invention 4 and the Prior Invention are substantially the same.

Therefore, it cannot be said that Invention 4 is identical with the Prior Invention without determination on Different Feature 1.

4. Regarding Inventions 5, 6, and 10 to 12

Invention 10 is an invention of a device (second UE) corresponding to Invention 4 which is an invention of a method, and includes, as with Invention 4, the following matters specifying the invention: "a step of transmits second information indicating whether the second UE is in coverage or out of coverage of a serving network to a fourth UE", and "when the first UE is selected as a reference for synchronization, the second information indicates that the second UE is out of coverage of the serving network". Accordingly, it cannot be said that Invention 10 is identical with the Prior Invention, for the same reason as for Invention 4.

Inventions 5 and 6 include all the matters specifying the invention of Invention 4. Inventions 11 and 12 include all the matters specifying the invention of Invention 10. Accordingly, for the same reason as for Invention 4, it cannot be said that Inventions 5, 6, 11, and 12 are identical with the Prior Invention.

No. 7 Regarding the examiner's decision

Inventions 1 to 3, and 7 to 9 each include matters specifying the invention that the inventions include "a step of transmitting information indicating whether the first UE is in coverage or out of coverage of a serving network to the second UE" and "when the third UE is selected as a reference for synchronization, the information indicates that the first UE is out of coverage of the serving network". Accordingly, as described in No. 6 "1." and "2.", it cannot be said that the inventions are identical with the invention described in the prior application specification, etc. cited in the examiner's decision of refusal. Therefore, the reasons of the examiner's decision cannot be maintained.

Inventions 4 to 6, and 10 to 12 each include matters specifying the invention that the inventions include "a step of transmitting second information indicating whether the second UE is in coverage or out of coverage of the serving network to a fourth UE" and "when the first UE is selected as a reference for synchronization, the second information indicates that the second UE is out of coverage of the serving network". Accordingly, as described in No. 6 "3." and "4.", it cannot be said that the inventions are identical with the invention described in the prior application specification, etc. cited in the examiner's decision of refusal. Therefore, the reasons of the examiner's decision cannot be maintained.

No. 8 Regarding the reasons for refusal by the body

1 Regarding Article 36(6)(i) and Article 36(6)(ii) of the Patent Act

(1) The notice of reasons for refusal by the body dated September 16, 2020 stated that the matter recited in Claims 2 and 8, "when the first sync signal is generated based on

second information received from a base station, the information indicates that the first UE is in coverage of the serving network", is not described in the detailed description of the invention and it is not clear. Against this, the above matter was amended by the written amendment dated November 25, 2020, as follows "when the second sync signal is generated, replacing the first sync signal, based on a sync signal received from a base station, the information indicates that the first UE is in coverage of the serving network". As a result of the amendment, the recitation was included in the detailed description of the invention and made clear. The reasons for refusal have been resolved.

(2) The notice of reasons for refusal by the body dated September 16, 2020 stated that the matter recited in Claims 5 and 11, "the second information indicates that the first UE is out of coverage of the serving network", is not described in the detailed description of the invention. Against this, the above matter was amended by the written amendment dated November 25, 2020, as follows: "the first information indicates that the first UE is out of coverage of the serving network". As a result of the amendment, the recitation was included in the detailed description of the invention. The reasons for refusal have been resolved.

(3) The notice of reasons for refusal by the body dated September 16, 2020 stated that the matter recited in Claims 6 and 12, "when the first sync signal transmitted by the second UE is based on information from a base station, the first information indicates that the second UE is in coverage of the serving network", is not clear or is not described in the detailed description of the invention. Against this, the above matter was amended as follows, "when the second sync signal transmitted by the second UE is based on information from a base station, the second information indicates that the second UE is in coverage of the serving network". As a result of the amendment, the recitation was included in the detailed description of the invention. The reasons for refusal have been resolved.

No. 9 Closing

As above, the present application cannot be rejected due to the reasons of the examiner's decision.

In addition, beyond that, no reasons for refusal were found.

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

February 9, 2021

Chief administrative judge: KOKUBU, Naoki
Administrative judge: HIROKAWA, Hiroshi
Administrative judge: MOCHIZUKI, Akitoshi