Appeal decision

Appeal No. 2018-7817

Appellant Huawei Technologies Co., Ltd.

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The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2016-552258, entitled "System and Method for Device-to-Device Synchronization" (International Publication No. WO2015/066524 published on May 7, 2015, National Publication of International Patent Application No. 2017-501648 published on January 12, 2017) has resulted in the following appeal decision.

Conclusion

The appeal of the case was groundless.

Reason

No. 1 History of the procedures

The present application was filed on October 31, 2014 as an international filing date (priority claim under the Paris Convention received by the foreign receiving office on October 31, 2013, United States and October 31, 2014, United States). The history of the procedures is summarized below.

June 10, 2016: Submission of Written amendment
Dated May 26, 2017: Notice of reasons for refusal
September 4, 2017: Submission of Written opinion and Written amendment
Dated January 31, 2018: Examiner's decision of refusal
June 6, 2018: Submission of Written appeal against the examiner's decision of refusal and Written amendment
Dated September 10, 2019: Notice of reasons for refusal (the body)
December 16, 2019: Submission of Written opinion

No. 2 The Invention

The invention according to the claims of the present application is as specified by the matters recited in Claims 1 to 10 of the scope of claims amended by the written amendment submitted on June 6, 2018. The invention according to Claim 1 (hereinafter referred to as "the Invention") is recognized as follows.

"A method, comprising:

a step of configuring, by a base station, a synchronization resource comprising a time resource, a frequency resource, or a time and frequency resource, for first user equipment (UE) that is in a radio resource control connected (RRC_CONNECTED) state with the base station, for transmitting a first device-to-device synchronization signal (D2DSS); and

a step of instructing, by the base station, the first UE to transmit the first D2DSS according to the configuring, wherein

the configuring is signaled independently from the instructing,

the synchronization resource is selected by the base station, and

the step of configuring the first UE and the step of instructing the first UE to transmit are each performed with a predetermined signaling transmitted from the base station."

No. 3 Outline of reasons for refusal of the body

The outline of the reasons for refusal of the body includes the following sentences, "The invention according to the following claims of this application could have been easily made by a person ordinarily skilled in the art of the invention prior to the filing of the application, on the basis of the invention described in the following publication distributed or inventions that were made publicly available through an electric telecommunication line, in Japan or a foreign country prior to the filing of the application. Thus, the Appellant should not be granted a patent for the invention under the provisions of Article 29(2) of the Patent Act." The following Cited Documents 1 to 3 are cited with respect to Claim 1.

Cited Document 1: Ericsson, Realization of D2D broadcast communication, 3GPP TSG-RAN WG2#83bis R2-133300, published on September 28, 2013

Cited Document 2: ZTE, Discussion on Synchronization for Discovery, 3GPP TSG-RAN WG1#78, R1-143143, published on August 10, 2014

Cited Document 3: LG Electronics, Details of Conditions for D2DSS Transmissions, 3GPP TSG RAN WG1 #78bis R1-144016, published on September 27, 2014

No. 4 Regarding Priority claim

Regarding the present application, a priority claim was made under the Paris Convention based on U.S. patent application No. 61/898194 (October 31, 2013) (hereinafter referred to as "Priority Basic Application 1") and U.S. patent application No. 14/530269 (October 31, 2014) (hereinafter referred to as "Priority Basic Application 2").

Regarding the matters specifying the invention, "the configuring is signaled independently from the instructing", Priority Basic Application 2 includes the following description in [0084].

"In an embodiment, in block 602, the base station configures a UE that is in a radio resource control connected (RRC_CONNECTED) state with the base station to be a synchronization source to transmit a device to-device synchronization signal (D2DSS), by an RRC signaling transmitted by the base station. In block 604, the base station configures, by an RRC signaling transmitted by the base station, a synchronization resource for the UE, with the synchronization resource comprising a time resource, a frequency resource, or a time and frequency resource on the uplink for transmission of D2DSS by the UE. In an embodiment, the base station configures the UE by RRC dedicated signaling. For example, 2 states of one bit may be used to indicate to the UE to start transmitting the D2DSS or to stop transmitting the D2DSS."

Thus, it can be said that the Priority basic application 2 describes that the base station configures a synchronization resource for the UE by RRC signaling and indicates (instructs) to the UE to start transmitting the D2DSS by using RRC dedicated signaling. Accordingly, it is recognized to indicate that "the configuring" of the synchronization resource "is signaled independently from the instructing".

On the other hand, Priority Basic Application 1 includes the following descriptions as descriptions related to "configuring" and "instructing" in the matters specifying the invention.

[0026] (The latter one of two paragraphs having the same number. The same applies hereinafter.)
"If none is detected, the UE sends a synchronization signal if it is out-of-coverage, or requests to be a cluster head if it is in-coverage, and then sends a synchronization signal as instructed by the eNB."

[0027]
"Figure 2 illustrates a flow diagram for an eNB to respond to a UE cluster head request, and Figure 3 illustrates a flow diagram for an eNB to configure a cluster head and synchronization signal. The eNB configuration message may include the transmit power of the synchronization signal, which is set by the eNB to manage interference and the cluster coverage. It also may include the resource for the synchronization signal, including frequency, periodicity, etc."

However, even if considering the above descriptions and other descriptions, Priority Basic Application 1 does not describe or indicate the matter corresponding to the matters specifying the invention, "the configuring is signaled independently from the instructing".

Therefore, regarding the above matter, no effect of the priority claim based on Priority Basic Application 1 is recognized, and a reference date for judgment on novelty and inventive step is recognized as October 31, 2014, which is the filing date of Priority Basic Application 2.

No. 5 Cited Invention and well-known art
1 Cited Invention 1

The document, Ericsson, Realization of D2D Broadcast Communication, 3GPP TSG-RAN WG2#83bis R2-133300, published on September 28, 2013, URL:https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_83bis/Docs/R2-133300.zip (hereinafter referred to as "Cited Document 1"), which was cited in the reasons for refusal by the body, includes the following descriptions with drawings.

"3.2 Out of Coverage
(Omitted)
To keep the UEs synchronized during the user data transmission, the transmitting UE could transmit the synchronization signals periodically." (page 3/6, lines 12 to 23)

"3.3.2 Communication from a UE in coverage
In this case UE-B will initiate the D2D broadcast communication occasion. UE-B is in coverage and can therefore not use resources in the D2D resource pool without being granted by the eNB. Thus, in order to make a transmission to UE-A, UE-B must first

request which resources to use. Similar to the out of coverage scenario, the eNB would allocate known resources out of the D2D resource pool for UE-B to use for the synchronization step and scheduling assignment step. As the user data transmission may be performed on any resources in the D2D resource pool, the eNB may select any suitable resource for this step. After being granted resources out of the D2D resource pool, UE-B initiates the D2D broadcast communication occasion.

Requesting resources from the eNB may add to the delay. If all resources in the D2D resource pool were contention based in this scenario it could result in a shorter delay. However, this would mean that the eNB would potentially need to reserve the resources in the D2D resource pool for a longer time period, leading to an inefficient resource usage. Furthermore, if the resources were contention based, collisions would occur as the traffic increases, thus impacting capacity. It is likely that the eNB would be able to achieve a higher capacity in a non-contention based scheme. Which solution is the best one depends on several factors, the size of the D2D resource pool, the required capacity, and the required delay, to name a few. We think the possibility for increased capacity speaks in favour of a non-contention based scheme.

UE-A, being out of coverage, is configured to monitor a known subset of the resources in the D2D resource pool to perform the synchronization step. This is similar to the out of coverage scenario.

Proposal 10 A UE in coverage performs the synchronization step and scheduling assignment step on the resources in the D2D resource pool granted by the eNB." (page 5/6, lines 1 to 20)

"3.4 In coverage
(Omitted)
We think that RRC states only apply for UEs in coverage. ProSe-enabled UEs in RRC_IDLE can receive and decode D2D broadcast communication occasions from another UE. This increases the possibility for a UE in coverage to receive the D2D broadcast communication occasion from a UE out of coverage. However, a UE in coverage must be RRC_CONNECTED when it transmits data even for D2D broadcast communication to a UE out of coverage. The reason is that the described procedure in section 3.3.2 requires the UE to first request resources from the eNB." (page 5/6, lines 21 to 33)

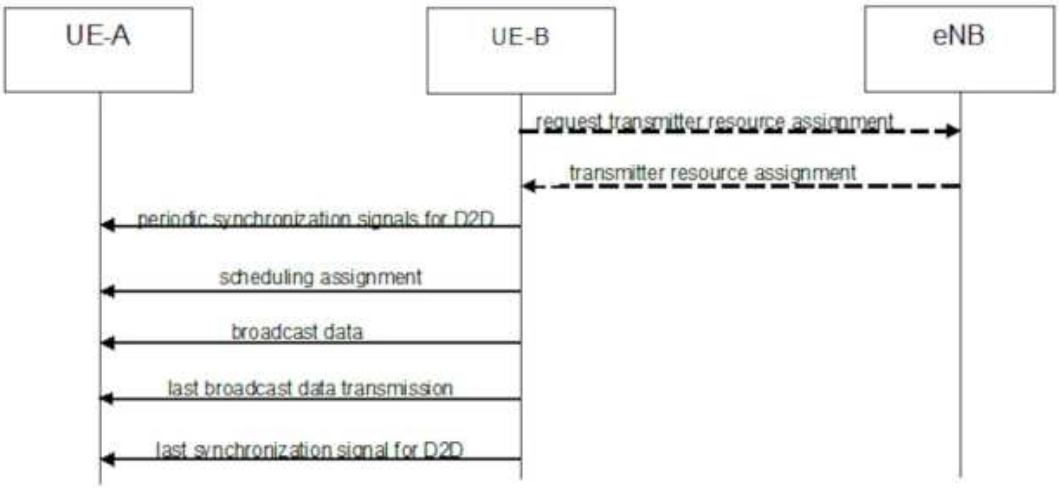

Figure 1: An example flow chart with D2D broadcast transmitter and receiver procedures. In this case, UE-A is out of coverage, and UE-B is in coverage.

According to the description in Cited Document 1, "Similar to the out of coverage scenario, the eNB would allocate known resources out of the D2D resource pool for UE-B to use for the synchronization step and scheduling assignment step", the eNB is recognized to allocate resources for a synchronization step to the UE-B.

According to the description, "After being granted resources out of the D2D resource pool, UE-B initiates the D2D broadcast communication occasion", it is recognized that "the UE-B initiates a D2D broadcast communication occasion after being granted the resources".

As is obvious from the description, "However, a UE in coverage must be RRC_CONNECTED when it transmits data even for D2D broadcast communication to a UE out of coverage. The reason is that the described procedure in section 3.3.2 requires the UE to first request resources from the eNB", the UE-B being a UE in coverage is recognized as being RRC_CONNECTED.

According to the description, "To keep the UEs synchronized during the user data transmission, the transmitting UE could transmit the synchronization signals periodically", and FIG. 1, it is recognized that the UE-B being a transmitting UE transmits (periodic) synchronization signals for D2D after being allocated resources from the eNB and that transmitting the synchronization signals for D2D is included in

the synchronization step.

As above, it is recognized that Cited Document 1 describes the matter, "the eNB allocates resources for a synchronization step including transmitting synchronization signals for D2D, to the UE-B being RRC_CONNECTED".

Accordingly, it is recognized that the following invention (hereinafter referred to as "Cited Invention") is described in Cited Document 1.

"A method including:

allocating, by an eNB, resources for a synchronization step including transmitting synchronization signals for D2D, to a UE-B being RRC_CONNECTED; and

initiating, by the UE-B, a D2D broadcast communication occasion after being granted the resources".

2 Cited Document 2

The document, ZTE, Discussion on Synchronization for Discovery, 3GPP TSG-RAN WG1#78, R1-143143, published on August 10, 2014, URL:https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_78/Docs/R1-143143.zip (hereinafter referred to as "Cited Document 2"), which was cited in the reasons for refusal by the body, includes the following descriptions with drawings.

"4. Type 2B Discovery

For Type 2B discovery UEs that are RRC connected, it is feasible to indicate UEs whether to transmit D2DSS using dedicated RRC signaling. In this way, eNB can instruct discovery UEs to transmit D2DSS in UE-specific manner, and low UE power consumption and effective interference coordination can be achieved." (page 2, line 15 to page 3, line 3)

As above, it is recognized that Cited Document 2 describes the matter, "an eNB instructs a UE to transmit D2DSS using dedicated RRC signaling".

3 Cited Document 3

The document, LG Electronics, Details of Conditions for D2DSS Transmissions, 3GPP TSG RAN WG1 #78bis R1-144016, published on September 27, 2014, URL:https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_78b/Docs/R1-144016.zip (hereinafter referred to as "Cited Document 3"), which was cited in the reasons for

refusal by the body, includes the following descriptions with drawings.

"2. Conditions for D2DSS Transmissions
2.1. UEs inside network coverage
For UEs inside network coverage, conditions for D2DSS transmissions are basically defined from eNB signaling. In the agreement in RAN1#77, both SIB and dedicated RRC signaling can be used to configure D2DSS sequences to be used for transmissions. In addition, the agreement is saying that eNB can instruct a UE to transmit D2DSS for Type 2B discovery, and it is our understanding that this instruction should use dedicated signaling because of the UE-specific nature of Type 2B discovery. From these agreements, it can be claimed that eNB can instruct D2DSS transmission (with the D2DSS sequence to use) using both SIB and dedicated signaling. Furthermore, it will be straightforward to extend this signaling to encompass all the D2D operations including D2D communications.

When a UE receives dedicated signaling instructing D2DSS transmissions, it shall transmit D2DSS accordingly regardless of any other D2DSS-related signaling it can receive via SIB. We note that this instruction can be implicit, for example, a UE transmits D2DSS if it receives signaling for D2DSS sequences and D2DSS resources via dedicated signaling.

When a UE receives SIB instructing D2D transmissions, all the SIB-receiving UEs may transmit D2DSS which may be unnecessarily excessive in some cases. So, an additional condition can be considered to avoid such cases. To be specific, RSRP from the serving cell can be used such that only the UEs having RSRP lower than a network-configured threshold transmit D2DSS. The main motivation of this is to stop D2DSS transmissions from UEs close to the eNB whose D2DSS transmission are not much useful for the UEs in the neighboring cells or outside network coverage.

Proposal 1: Both dedicated signaling and SIB can be used for eNB to instruct D2DSS transmissions."
(page 2, lines 8 to 28)

As above, it is recognized that Cited Document 3 describes the matter, "a UE receives dedicated signaling for instructing D2DSS transmissions, and transmits D2DSS accordingly, and this instruction can be implicit; i.e., a UE transmits D2DSS if it

receives dedicated signaling for D2DSS sequences and D2DSS resources".

Therefore, according to descriptions in the Cited Documents 2 and 3, it is recognized that the matter, "an eNB indicates (instructs) to transmit D2DSS using dedicated signaling", is a matter of well-known art.

No. 6 Comparison

The Invention and the Cited Invention are compared.

1

The "eNB" and "UE-B" in the Cited Invention correspond to the "base station" and "first user equipment (UE)" in the Invention, respectively.

The matter in the Cited Invention, "transmitting synchronization signals for D2D", corresponds to the matter in the Invention, "transmitting a first device-to-device synchronization signal (D2DSS)".

The "resources for a synchronization step including transmitting synchronization signals for D2D" in the Cited Invention corresponds to the "synchronization resource" in the Invention.

Regarding the matters specifying the invention in the Cited Invention, "allocating, by an eNB, resources for a synchronization step including transmitting synchronization signals for D2D, to a UE-B being RRC_CONNECTED", the eNB, which allocates resources to a UE-B, is considered to configure the resources.

Accordingly, comparing the matter in the Invention, "a step of configuring, by a base station, a synchronization resource comprising a time resource, a frequency resource, or a time and frequency resource, for a first user equipment (UE) that is in a radio resource control connected (RRC_CONNECTED) state with the base station, for transmitting a first device-to-device synchronization signal (D2DSS)", with the matter in the Cited Invention, "allocating, by an eNB, resources for a synchronization step including transmitting synchronization signals for D2D, to a UE-B being RRC_CONNECTED", they are identical in the point of including "a step of configuring, by a base station, a synchronization resource, for a first user equipment (UE) that is in a radio resource control connected (RRC_CONNECTED) state with the base station, for transmitting a first device-to-device synchronization signal (D2DSS)", and the point that "the synchronization resource is selected by the base station".

2

According to the matter in the Cited Invention, "initiating, by the UE-B, a D2D broadcast communication occasion after being granted the resources", it can be said that the "grant" is an instruction for the UE-B to transmit D2DSS. Therefore, the above matter in the Cited invention corresponds to the "step of instructing, by the base station, the first UE to transmit the first D2DSS according to the configuring" in the Invention.

3

Therefore, the Invention and the Cited Invention are identical in the following points,

"A method comprising:

a step of configuring, by a base station, a synchronization resource for a first user equipment (UE) that is in a radio resource control connected (RRC_CONNECTED) state with the base station, for transmitting a first device-to-device synchronization signal (D2DSS); and

a step of instructing, by the base station, the first UE to transmit the first D2DSS according to the configuring, wherein

the synchronization resource is selected by the base station."

They are different in the following points.

(Different Feature 1)

The "synchronization resource" in the Invention "comprises a time resource, a frequency resource, or a time and frequency resource", while the Cited Invention does not specify the above matter.

(Different Feature 2)

In the Invention, "the configuring is signaled independently from the instructing", and "the step of configuring the first UE and the step of instructing the first UE to transmit are each performed with a predetermined signaling transmitted from the base station". The Cited Invention is not configured so that "the configuring is signaled independently from the instructing", and does not specify the matter, "the step of configuring the first UE and the step of instructing the first UE to transmit are each performed with a predetermined signaling transmitted from the base station".

No. 7 Judgment

The above different features are examined below.

(Regarding Different Feature 1)

Well-known device-to-device communication resources may be applied, when necessary, as specific resources to be included as resources of device-to-device synchronization signals. The "time resource", "frequency resource", and "time and frequency resource" are all well-known device-to-device communication resources. Accordingly, a person skilled in the art could easily conceive of "comprising a time resource, a frequency resource, or a time and frequency resource" as device-to-device synchronization resources.

(Regarding Different Feature 2)

As examined in "No. 5", the matter, "an eNB indicates (instructs) to transmit D2DSS using dedicated signaling", is a matter of well-known art. The dedicated signaling, which cannot function as an instruction obviously unless it is determined between an eNB and a UE in advance for instruction, is recognized as "a predetermined signaling". Accordingly, a person skilled in the art could easily conceive of the idea that an instruction from an eNB to a UE-B is "performed with a predetermined signaling" in the Cited Invention.

When an eNB instructs a UE to transmit information, it is technically obvious that resources to be used for the transmission must be configured before the transmission, and it is common that configuring resources and instructing communication using the resources are performed by different signalings. Thus, a person skilled in the art could easily conceive of signaling for configuring D2DSS resources separately from dedicated signaling for D2DSS resources.

Summarizing the above, in the Cited Invention, a person skilled in the art could easily conceive of the ideas, "the configuring is signaled independently from the instructing" and "the step of configuring the first UE and the step of instructing the first UE to transmit are each performed with a predetermined signaling transmitted from the base station".

Therefore, the Invention could have been easily made by a person skilled in the art based on the Cited Invention and well-known art.

No. 8 Closing

As above, the Appellant should not be granted a patent for the Invention under the provisions of Article 29(2) of the Patent Act. The Invention should be rejected

without examining inventions according to other claims.

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

April 22, 2020

Chief administrative judge: SUGAHARA, Michiharu
Administrative judge: IWAMA, Naozumi
Administrative judge: HONGO, Akira