Appeal decision

Appeal No. 2020-4838

Appellant	Telefonaktiebolaget LM Ericsson (publ)
Patent Attorney	SONODA, Yoshitaka
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The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2018-514807 entitled "METHODS AND APPARATUSES FOR CONTROLLING TIMING OF FEEDBACK TRANSMISSIONS" [International Publication No. WO 2017/052437 published on March 30, 2017, National Publication of International Patent Application No. 2018-534816 published on November 22, 2018] 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 21, 2015 as an International Patent Application (priority claim under the Paris Convention: September 21, 2015 received by the foreign receiving office, United States). A translation of an amendment under Article 34 of Patent Cooperation Treaty was submitted on May 9, 2018. A written amendment was submitted on June 1, 2019. A notice of reasons for refusal was issued on April 5, 2019. A written opinion and a written amendment were submitted on July 16, 2019. An examiner's decision of refusal was issued on November 29, 2019. Against this, an appeal was made on April 9, 2020.

No. 2 The Invention

The invention according to the claims of the application is recognized as recited in Claims 1 to 12 of the scope of claims. The invention according to Claim 1 (hereinafter referred to as "the Invention") is as follows.

"A method for controlling the timing of feedback transmissions by a communication device (80) communicating over a communication link (70), wherein the communication link supports a re-transmission scheme, the method comprising:

transmitting (42) a feedback timing indicator (FTI) and data in at least one of a subframe and a slot, the FTI being selected from a set of indicators, the FTI indicating that retransmission feedback is requested in at least one of the same subframe and the slot in which the data were transmitted, and the format of the data being based on the FTI; and

receiving retransmission feedback related to the transmitted data in at least one of the same subframe and slot."

No. 3 Reasons for refusal stated in the examiner's decision

The outline of the reasons for refusal stated in the examiner's decision is as follows: The invention according to Claim 1 of the application could have been easily made by a person ordinarily skilled in the art of the invention before the filing of the application on the basis of the following Cited Documents 1 and 2 (Cited Document 3 and Cited Document 4 in the examiner's decision) which were distributed or made publicly available through an electric telecommunication line in Japan or a foreign country before 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.

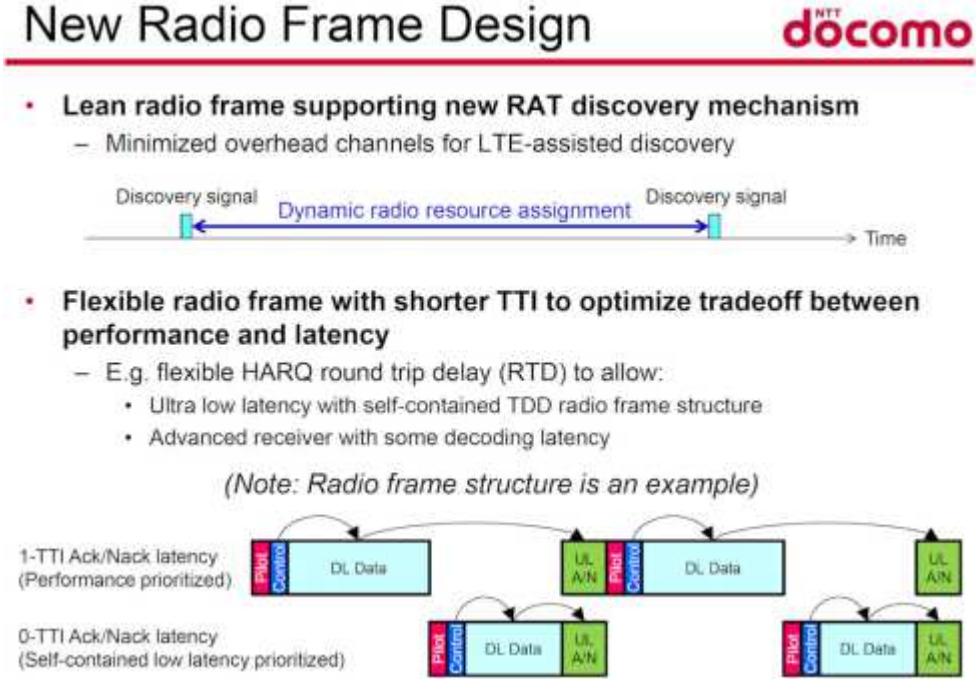
Cited Document 1 does not clearly specify the signaling, while the signaling in Cited Document 2 (especially in FIG. 3 and 11) is well-known. For example, it can be said that signaling which one of the two structures presented in p. 17 of Cited Document 1 corresponds to indicating feedback timing or format.

Cited Document 1 (Cited Document 3 in the examiner's decision): NTT DOCOMO, INC., 5G Vision for 2020 and Beyond [online], 3GPP workshop 2015-09-17_18_RAN_5G RWS-150051, Internet <URL:http://www.3gpp.org/ftp/workshop/2015-09-17_18_RAN_5G/Docs/RWS-

150051.zip>, September 3, 2015
Cited Document 2 (Cited document 2 in the examiner's decision): CN Patent Publication No. 104468030 Specification

No. 4 Cited Document

Cited Document 1 (NTT DOCOMO, INC., 5G Vision for 2020 and Beyond [online], 3GPP RAN workshop on 5G, Phoenix, AZ, USA (17-18 September, 2015) RWS-150051, Internet URL:http://www.3gpp.org/ftp/workshop/2015-09-17_18_RAN_5G/Docs/RWS-150051.zip) includes the following description (p. 17).



According to the description, "Flexible radio frame with shorter TTI to optimize tradeoff between performance and latency - E.g. flexible HARQ roundtrip delay (RTD) to allow: ...", Cited Document 1 discloses a flexible radio frame configured to obtain flexible HARQ roundtrip delay.

As an example of radio frame structure ("Note: Radio frame structure is an example"), timings of DL Data and UL A/N in 1-TTI Ack/Nack delay and 0-TTI Ack/Nack delay are described respectively. In both cases, arrows are indicated from Control to DL Data, and arrows from DL Data to UL A/N are indicated.

According to common general technical knowledge of HARQ, it is obvious that the "DL Data" means downlink data and that "UL A/N" means Ack/Nack of uplink for downlink data. The roundtrip delay is a period of time from when a transmission

device transmits transmission data until receipt of reception data corresponding to the transmission data. Thus, the HARQ roundtrip delay in Cited Document 1 is recognized as delay time from transmitting DL Data to receiving UL A/N.

Considering a matter of common general technical knowledge that data transmission is generally performed based on control of control data and Ack/Nack is transmitted in response to the data transmission, the arrows in the figure are considered to indicate that DL Data based on Control are transmitted in the base station, Ack/Nack with respect to the DL Data received by the terminal is transmitted by UL, and the base station receives Ack/Nack.

According to the common general technical knowledge, frame structure is segmented by time. Thus, it is obvious that the time advances from the left to the right in the figure. In the figure, radio frame structures of 1-TTI and 0-TTI are arranged vertically in two rows, and a length of a part composed of Pilot, Control, and DL Data in 1-TTI and a length of a part composed of Pilot, Control, DL Data, and UL A/N in 0-TTI are substantially the same. Thus, it is considered that the parts represent a frame having a time length of 1 TTI. In the case of 0-TTI, a frame is composed of Pilot, Control, DL Dara, UL A/N, and it is considered that Ack/Nack is transmitted in the same TTI (the delay of Ack/Nack is 0 TTI). In the case of 1-TTI, a frame is composed of Pilot, Control, and DL Data, and it is considered that UL A/N is transmitted at the time corresponding to the end of the next TTI (the delay of Ack/Nack is 1 TTI).

Therefore, it is recognized that Cited Document 1 describes, as examples of "flexible HARQ roundtrip delay", HARQ roundtrip delay where UL Ack/Nack is transmitted in the next frame of DL Data to generate Ack/Nack delay of 1 TTI, and HARQ roundtrip delay where UL Ack/Nack is transmitted in the same frame as DL Data to generate Ack/Nack delay of 0 TTI.

In light of the above, Cited Document 1 describes the following matter (hereinafter referred to as "Cited Invention 1"):

"A method,
using 0-TTI radio frame structure and 1-TTI radio frame structure as examples of flexible radio frame for obtaining flexible HARQ roundtrip delay, wherein

in 0-TTI radio frame structure, a radio frame is composed of Pilot, Control, DL Data, and UL A/N,

in 1-TTI radio frame structure, a radio frame is composed of Pilot, Control, and

DL Data,

including:

in both radio frame structures, transmitting DL Data on the basis of Control and receiving Ack/Nack for the transmitted DL Data; and

in 0-TTI radio frame structure, transmitting DL Data and Ack/Nack for the DL Data in one frame."

Cited Document 2 (CN Patent Publication No. 104468030 Specification published on March 25, 2015. National Publication of International Patent Application No. 2017-529782, which is a patent family thereof, is referred as the translation by the body. The parts translated by the body are underlined.) includes the following description.

[0318] 基站通过第二控制消息携带 RTT 标识指示 RTT 长度，请参阅图 3，本发明实施例中数据传输方法的另一个实施例包括：

[0319] 301、用户设备接收所述基站发送的第二控制消息；

[0320] 用户设备接收所述基站发送的第二控制消息，所述第二控制消息用于通知 RTT 标识所对应的 RTT 长度。

[0321] 示例性的，所述第二控制消息可以由基站通过高层信令发送。

[0322] 进一步的，所述第二控制消息还可以用于指示使用 RTT 长度对应的需要传输的数据类型。

[0323] 具体的，所述数据的类型可以用不同的逻辑信道来表征，此时，可以通过 RTT 长度与逻辑信道号标识对应；或者，

[0324] 所述数据的类型可以用不同的逻辑信道组来表征，此时，可以通过 RTT 长度与逻辑信道组标识对应；或者，

[0325] 所述数据的类型可以用不同的无线承载来表征，此时，可以通过 RTT 长度与无线承载标识对应；或者，

[0326] 所述数据的类型可以用不同的数据流来表征，此时，可以通过 RTT 长度与数据流号标识对应；其中不同的数据流可以是具有不同的 IP 地址，或者 IP 地址及端口号的数据流。

[0327] 可以理解的，上述数据类型与 RTT 长度对应关系可以是一对一，也可以是一对多，

或者多对一，具体本发明实施例不作限定。

[0328] 可选的，当用户设备配置有多个载波时，不同载波可以使用不同的 RTT 长度，此时，可以理解成不同数据类型可以对应到不同的载波上面。

[0329] 进一步的，在跨基站多流聚合场景下，上述载波也可以替换成基站，实施方法类似，不再赘述。

[0330] 302、用户设备接收所述基站发送的第三控制消息；

[0331] 用户设备接收所述基站通过物理层信令发送的第三控制消息，所述第三控制消息为包括：RTT 标识，所述 RTT 标识用于指示传输所述数据对应的 RTT 长度；

[0332] 示例性的，所述第三控制消息可以由基站通过物理层信令发送；进一步的，所述第三控制消息可以为 DCI 消息。

[0333] 示例性的，所述第三控制消息可以为新定义的 DCI 消息，其中，该 DCI 消息中增加了用于指示 RTT 长度的 RTT 标识（shortenRTTIndicator）。

[0334] 303、用户设备根据所述 RTT 标识确定传输所述数据对应的 RTT 长度；

[0335] 用户设备根据所述 RTT 标识确定传输所述数据对应的 RTT 长度。

[0336] 示例性的，假设 RTT 长度的类型有两种，分别为第一 RTT 和第二 RTT，其中，所述第一 RTT 的长度大于所述第二 RTT 的长度；RTT 标识用 shortenRTTIndicator 表示，如果 shortenRTTIndicator = 0，则确定传输所述数据对应的 RTT 长度为第一 RTT；如果 shortenRTTIndicator = 1，则确定传输所述 数据对应的 RTT 长度为第二 RTT，并使用第二 RTT 所对应的数据收发规则。或者，RTT 标识直接表示 RTT 长度，具体本发明实施例不作限定。

[0337] 304、用户设备根据所述 RTT 长度与所述基站进行所述数据的传输。

[0338] 用户设备根据所述 RTT 长度与所述基站进行所述数据的传输；具体的，用户设备与所述基站进行所述数据的传输包括：用户设备接收基站发送的业务数据，用户设备向基站发送业务数据，以及用户设备向基站发送反馈信息，以及用户设备接收基站发送的反馈信息；具体的所述反馈信息可以包括：HARQ 反馈，比如，用户设备接收基站发送的业务数据后，向基站发送所述业务数据的 HARQ 反馈，或者用户设备向基站发送业务数据后，接收基站发送的所述业务数据的 HARQ 反馈

[0339] 示例性的，若确定所述 RTT 长度为第一 RTT，则使用第一 RTT 所对应的数据收发规则；若确定所述 RTT 长度为第二 RTT，则使用第二 RTT 所对应的数据收发规则。

[0340] 进一步的，如果所述第二控制消息指示使用不同的 RTT 长度分别对应的需要传输的数据类型时，用户设备传输所述 RTT 长度对应的类型的数据。

(Translation by the body:

[0318] A base station uses an RTT identifier carried in a second control message, to indicate an RTT length. Referring to FIG. 3, another embodiment of a data transmission method in an embodiment of the present disclosure includes the following steps.

[0319] 301. User equipment receives a second control message sent by the base station.

[0320] The user equipment receives the second control message sent by the base station, where the second control message is used to notify an RTT length corresponding to an RTT identifier.

[0321] Exemplarily, the second control message may be sent by the base station by using higher layer signaling.

[0322] Further, the second control message may be further used to instruct use of a type that is of data needing to be transmitted and that corresponds to an RTT length.

[0323] Specifically, the type of the data may be represented by using different logical channels, and in this case, may correspond to a logical channel number identifier by using an RTT length; or

[0324] the type of the data may be represented by using different logical channel groups, and in this case, may correspond to a logical channel group identifier by using an RTT length; or

[0325] the type of the data may be represented by using different radio bearers, and in this case, may correspond to a radio bearer identifier by using an RTT length; or

[0326] the type of the data may be represented by using different data flows, and in this case, may correspond to a data flow number identifier by using an RTT length. The different data flows may be data flows with different IP addresses, or with different IP addresses and different port numbers.

[0327] It may be understood that, the foregoing correspondence between a data type and an RTT length may be one-to-one, one-to-many, or many-to-one. This is not specifically limited in this embodiment of the present disclosure.

[0328] Optionally, when multiple carriers are configured for the user equipment, different carriers may use different RTT lengths. In this case, different data types may be understood as corresponding to different carriers.

[0329] Further, in an inter-base station multi-stream aggregation scenario, base stations may also substitute for the foregoing carriers. An implementation method is similar, and details are not described herein repeatedly.

[0330] 302. The user equipment receives a third control message sent by the base station.

[0331] The user equipment receives the third control message sent by the base station by using physical layer signaling, where the third control message includes the RTT identifier, and the RTT identifier is used to indicate a corresponding RTT length for transmitting the data.

[0332] Exemplarily, the third control message may be sent by the base station by using physical layer signaling. Further, the third control message may be a DCI message.

[0333] Exemplarily, the third control message may be a newly-defined DCI message, and an RTT identifier (shortenRTTIndicator) used for indicating an RTT length is added to the DCI message.

[0334] 303. The user equipment determines, according to the RTT identifier, a corresponding RTT length for transmitting the data.

[0335] The user equipment determines, according to the RTT identifier, the corresponding RTT length for transmitting the data.

[0336] Exemplarily, it is assumed that there are two types of RTT lengths, which are a first RTT and a second RTT, respectively, where a length of the first RTT is greater than a length of the second RTT. The RTT identifier is indicated by shortenRTTIndicator, and if shortenRTTIndicator=0, it is determined that the corresponding RTT length for transmitting the data is the first RTT; or if shortenRTTIndicator=1, it is determined that the corresponding RTT length for transmitting the data is the second RTT, and a data sending and receiving rule corresponding to the second RTT is used. Alternatively, the RTT identifier directly indicates an RTT length. This is not specifically limited in this embodiment of the present disclosure.

[0337] 304. The user equipment performs transmission of the data with the base station according to the RTT length.

[0338] The user equipment performs transmission of the data with the base station according to the RTT length. Specifically, the user equipment performing transmission of the data with the base station includes: the user equipment receives service data sent by the base station, the user equipment sends service data to the base station, the user equipment sends feedback information to the base station, and the user equipment receives feedback information sent by the base station. Specifically, the feedback information may include an HARQ feedback. For example, after receiving the service data sent by the base station, the user equipment sends an HARQ feedback of the service data to the base station; or after sending the service data to the base station, the user equipment receives an HARQ feedback that is of the service data and is sent by the base station.

[0339] Exemplarily, if it is determined that the RTT length is the first RTT, a data sending and receiving rule corresponding to the first RTT is used, or if it is determined that the RTT length is the second RTT, the data sending and receiving rule corresponding to the second RTT is used.

[0340] Further, when the second control message instructs use of types that are of data needing to be transmitted and separately correspond to different RTT lengths, the user equipment transmits data of a type corresponding to the RTT length.)

Thus, Cited Document 2 describes the following matter (hereinafter referred to as "Cited Invention 2").

"A method, wherein

a second control message sent by using higher layer signaling is used to notify an

RTT length corresponding to an RTT identifier,

a third control message sent by using physical layer signaling includes an RTT identifier (shortenRTTIndicator) which is used to indicate a corresponding RTT length for transmitting the data,

if shortenRTTIndicator=0, it is determined that the corresponding RTT length for transmitting the data is the first RTT; or if shortenRTTIndicator=1, it is determined that the corresponding RTT length for transmitting the data is the second RTT,

user equipment performs transmission of the data with the base station according to the RTT length,

feedback information may include an HARQ feedback, and after receiving the service data sent by the base station, the user equipment sends an HARQ feedback of the service data to the base station."

No. 5 Comparison

The Invention and Cited Invention 1 are compared below.

It is obvious that Cited Invention 1 is a method of a communication device communicating over a communication link, and Ack/Nack is a feedback in HARQ. Thus, it can be said that Cited Invention 1 is "a feedback method of a communication device communicating over a communication link".

It is technically common that a communication system which transmits Ack/Nack of HARQ performs retransmission by receiving Nack. Thus, it can be said that the communication system "supports a re-transmission scheme".

Cited Document 1 relates to "5G" technology according to the title, and includes the description, "Minimized overhead channels for LTE-assisted discovery". In light of common general technical knowledge of the above technologies (5G, LTE), the "TTI" in Cited Invention 1 is a length of a subframe, and the "radio frame" in Cited Invention 1 means a subframe in each of the technologies.

The "feedback timing indicator (FTI)" in the Invention, which is included in downlink control information and transmitted ([0043]), is control data. It is obvious that the "Control" in Cited Invention 1 is control data, and Cited Invention 1 transmits Control and DL Data in one TTI (subframe). Thus, the Invention and Cited Invention 1 are identical in "transmitting control data and data in at least one of a subframe and a slot".

Therefore, the Invention and Cited Invention 1 are identical in the following point:

"A feedback method by a communication device communicating over a communication link, wherein the communication link supports a re-transmission scheme, the method comprising: transmitting control data and data in at least one of a subframe and a slot, and

receiving retransmission feedback related to the transmitted data in at least one of the same subframe and slot."

The Invention and Cited Invention 1 are different in the following point.

The Invention is "a method for controlling the timing of feedback transmissions", and control data are a "feedback timing indicator (FTI)" which is selected from a set of indicators and indicates that retransmission feedback is requested in at least one of the subframe and the slot in which the data were transmitted, and the format of the data is based on the FTI. Cited Invention 1 is "a feedback method of a communication device communicating over a communication link" and does not describe controlling the timing of feedback transmissions.

No. 6 Judgment

The different feature is examined below.

Cited Invention 2 describes transmitting shortenRTTIndicator as control information and controlling transmission timing of HARQ feedback depending on whether shortenRTTindicator is 1 or 0. It is technically common that HARQ feedback is Ack/Nack.

Cited Invention 1 describes, as an example of flexible radio frame to obtain flexible HARQ roundtrip delay, two radio frame structures in accordance with transmission timing of Ack/Nacks for 1-TTI and 0-TTI. Thus, it is obvious that each of the two radio frame structures is used by some kind of means in order to obtain flexible HARQ roundtrip delay. Cited Invention 2 describes controlling first and second RTTs by shortenRTTindicator, or timing of Ack/Nack transmission. Thus, in Cited Invention 1, for using each of the two radio frame structures, applying shortenRTTindicator in Cited Invention 2 to introduce a configuration of controlling

Ack/Nack transmission timing for 1-TTI and 0-TTI by shortenRTTindicator can be easily conceived.

In addition, controlling transmission timing of Ack/Nack by shortenRTTIndicator means controlling Ack/Nack transmission timing for 1-TTI and 0-TTI and controlling radio frame structures for 1-TTI and 0-TTI. Thus, it can be said that the radio frame structure, or the format of the data, is based on shortenRTTIndicator.

The shortenRTTIndicator is control information for physical layer signaling, and it is transmitted by "Control" in Cited Invention 1 naturally.

The shortenRTTIndicator controls transmission timing of Ack/Nack, which is a feedback, by an indicator 0 or 1. Thus, it can be a feedback timing indicator (FTI), which is selected from a set of indicators and indicates that retransmission feedback is requested in at least one of the subframe and the slot in which the data were transmitted.

Accordingly, applying Cited Invention 2 in Cited Invention 1 results in transmitting shortenRTTIndicator by "Control" in Cited Invention 1 to "control the timing of feedback transmissions", which indicates that the control data is a "feedback timing indicator (FTI)" which is selected from a set of indicators and indicates that "retransmission feedback is requested in at least one of the subframe and the slot in which the data were transmitted" and that the format of the data is based on the FTI.

No. 7 Closing

In light of the above, the Invention could have been easily made by a person ordinarily skilled in the art of the invention before the filing of the application on the basis of the inventions described in Cited Documents 1 and 2. Thus, the Appellant should not be granted a patent for the invention under the provisions of Article 29(2) of the Patent Act.

The present application should be rejected without examining inventions according to other claims.

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

September 29, 2020

Chief administrative judge: KITAOKA, Hiroshi
Administrative judge: YOSHIDA, Takayuki

Administrative judge: MARUYAMA, Takamasa