



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/437,038	04/20/2015	Bengt Lindoff	1009-1391 / P46395 US1	5038
102721	7590	09/24/2020	EXAMINER	
Murphy, Bilak & Homiller/Ericsson 1255 Crescent Green Suite 200 Cary, NC 27518			DAVENPORT, MON CHERI S	
			ART UNIT	PAPER NUMBER
			2462	
			NOTIFICATION DATE	DELIVERY MODE
			09/24/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

official@mbhiplaw.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte BENGT LINDOFF and STEFANO SORRENTINO

Appeal 2019-003066
Application 14/437,038
Technology Center 2400

Before JOHN A. EVANS, JUSTIN BUSCH, and
JOHN P. PINKERTON, *Administrative Patent Judges*.

BUSCH, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 33–64, which are all the claims pending. Claims 1–32 have been canceled. Because the claims on appeal have been twice rejected, we have jurisdiction pursuant to 35 U.S.C. §§ 6 and 134(a). *Ex parte Lemoine*, 46 USPQ2d 1420, 1423 (BPAI 1994) (precedential).

We AFFIRM.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Telefonaktiebolaget LM Ericsson (publ). Appeal Br. 2.

STATEMENT OF THE CASE

INTRODUCTION

The claimed subject matter “generally relates to device-to-device communication in a cellular communication system.” Spec. 1:5–6. More specifically, the claimed subject matter relates to “a method performed in a controlling node of a cellular communication network” for “configuring gaps during which a device-to-device (D2D) enabled device is not expected to receive [or transmit] any cellular signal, but can use a receiver chain to detect D2D signals or D2D related control information.” Spec. 1:30–35, Abstract.

Claims 33 (method), 42 (method), 49 (controlling node comprising a processing circuit to perform the method), and 58 (D2D-enabled device comprising a processing circuit to perform the method) are independent.

Claim 42 is reproduced below:

42. A method performed in a D2D-enabled device for operating in a cellular communication system, comprising:

obtaining configuration of gaps during which the D2D-enabled device is not expected to receive any cellular signal but can use a receiver chain to detect D2D signals or D2D-related control information, either by:

receiving the configuration of gaps from a controlling node of the cellular communication network; or

deducing the timing of the gaps from timing of D2D subframes configured to carry D2D channels, whereby explicit signaling from the controlling node of the position of the gaps can be avoided; and

detecting, during gaps, D2D signals or D2D-related control information.

Appeal 2019-003066
Application 14/437,038
Appeal Br. 13 (Claims App.).

THE PENDING REJECTIONS

Claims 33–39, 41–46, 48–55, 57–62, and 64 stand rejected under 35 U.S.C. § 103 as obvious in view of Doppler (US 2011/0268004 A1; Nov. 3, 2011) and Sharma (US 2015/0245394 A1; Aug. 27, 2015). Non-Final Act. 3–8.

Claims 40, 47, 56, and 63 stand rejected under 35 U.S.C. § 103 as obvious in view of Doppler, Sharma, and Pelletier (US 2013/0322413 A1; Dec. 5, 2013). Non-Final Act. 8–9.

ANALYSIS

We have reviewed the Examiner’s rejections in light of Appellant’s arguments that the Examiner erred. In reaching this decision, we have considered all evidence presented and all arguments Appellant made. Arguments Appellant could have made, but chose not to make in the Briefs, are deemed waived. *See* 37 C.F.R. § 41.37(c)(1)(iv). Appellant argues the rejection of independent claims 42 and 58 as a group. *See* Appeal Br. 6–9. Appellant argues the rejection of independent claims 33 and 49 for the same reasons as independent claims 42 and 58. Appeal Br. 9. Claims 34–41 depend ultimately from independent claim 33; claims 43–48 depend ultimately from independent claim 42; claims 50–57 depend ultimately from independent claim 49; and claims 59–64 depend ultimately from independent claim 58. Appellant argues the rejections of these claims should be reversed for the same reasons as the independent claims from which they depend. *See* Appeal Br. 10–11. We select claim 42 as representative. *See* 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner finds the combination of Doppler and Sharma teaches or suggests every limitation recited in representative claim 42. Non-Final Act. 3–4. Of particular relevance to this Appeal, the Examiner finds Sharma teaches or suggests “obtaining configuration of gaps during which the D2D-enabled device is not expected to receive any cellular signal but can use a receiver chain to detect D2D signals or D2D-related control information.” Non-Final Act. 4 (citing Sharma ¶ 74, Figs. 4–5); Ans. 3–5 (additionally citing Sharma ¶¶ 61–62). Each of independent claims 33, 49, and 58 recites a similar limitation, for which the Examiner makes the same findings. *See* Appeal Br. 12, 14–15, 16 (Claims App.); Non-Final Act. 4; Ans. 3–5.

Sharma relates to a cellular communication network in which users of user equipment (UE) may communicate with each other via a device-to-device (D2D) service in the absence of an LTE cellular network (for example, where there is no coverage). Sharma ¶¶ 11, 44, 89. As cited by the Examiner, Figure 5 of Sharma is reproduced below.

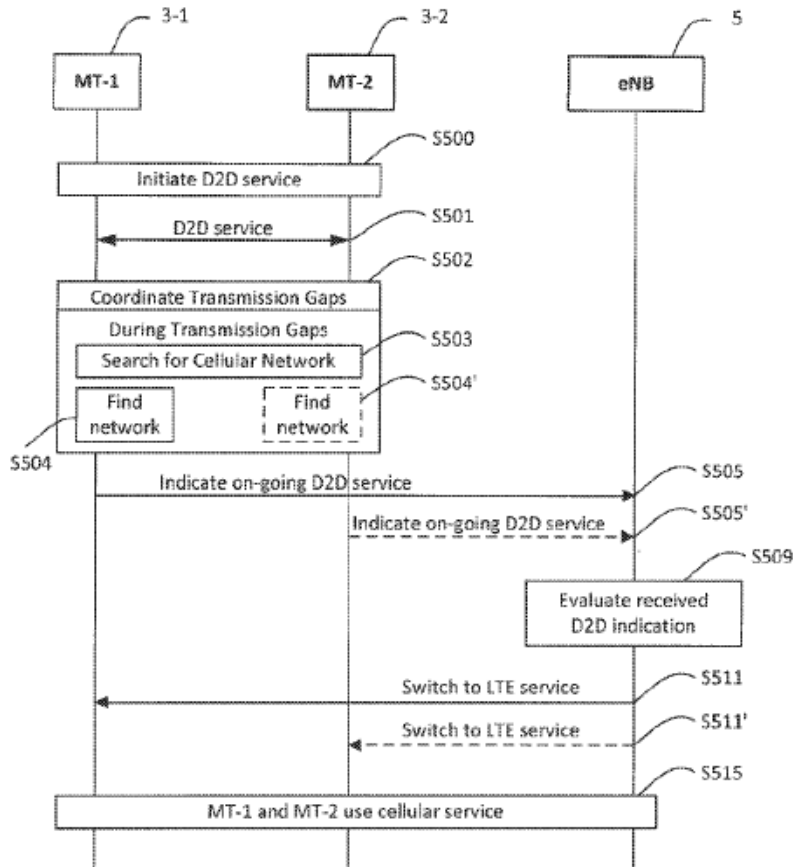


Figure 5 of Sharma is a timing diagram depicting how a base station 5 may instruct mobile telephones 3-1 (MT-1) and 3-2 (MT-2) to switch between D2D service and an LTE service. Sharma ¶ 42. As shown in steps s500 and s501, even if outside the coverage area of the cellular network, MT-1 and MT-2 may still communicate with each other by using their respective D2D control modules to initiate and use a D2D communication path. Sharma ¶¶ 73, 91 (explaining that “Steps s500 to s50[5]’ are similar to steps s400 to s405’ of FIG. 4, respectively”). As shown in steps s502 to s503, the D2D control modules may coordinate transmission gaps (silent periods) in the D2D communication (i.e., periods during which MT-1 and MT-2 do not transmit data but use their cellular network monitoring modules to search for

a cellular network). Sharma ¶¶ 74–75. In steps s504 to s505’, when MT-1 or MT-2 discovers a cellular network, the mobile telephone’s reporting module may generate and send base station 5 an indication of being involved in a D2D communication service. Sharma ¶¶ 76, 80. In step s509, the D2D authorization module of base station 5 may determine that MT-1 and MT-2 should (and can) be switched over to a cellular service instead of authorizing the already existing D2D service. Sharma ¶¶ 91–92. According to Sharma, such a switch may be necessary when interference caused by the D2D service is above a predetermined threshold or when additional functions not available using the D2D service are needed. Sharma ¶ 91. In step s511, the D2D authorization module of base station 5 generates and sends MT-1 and MT-2 message(s) instructing them to switch over to cellular service. Sharma ¶ 94. In step s515, MT-1 and MT-2 set up an LTE communication path using their respective communications control modules and start communicating with each other via the cellular network. And in step s517, the D2D control modules of MT-1 and MT-2 terminate the D2D service between the two mobile telephones. *See* Sharma ¶ 95.

Appellant argues Examiner error because “Sharma’s ‘silent’ periods are gaps in D2D communications, specifically intended to allow the mobile telephones to monitor the presence of cellular signals,” which “is precisely opposite of what the claims explicitly recite, that the gaps specify periods during which the D2D-enabled device is not expected to receive any cellular signal.” Appeal Br. 8. Appellant similarly argues that “Doppler’s ‘D2D transmission gaps’ . . . are essentially opposite of the ‘gaps’ recited in claim 42.” Appeal Br. 8 (citing Doppler ¶¶ 37–38, Fig. 6). Appellant explains that Doppler’s gaps “are negotiated pauses in D2D transmissions, so that the D2D device can communicate with the cellular network,” whereas “the

‘gaps’ recited in claim 42 are explicitly defined as intervals during which the D2D device is not expected to receive any cellular signals and is thus able to receive D2D signals.” Appeal Br. 8.

In response to Appellant’s arguments, the Examiner finds, in relevant part, that “[t]he gaps which are broadly claimed as shown in applicants [sic] fig. 6, as either D2D communication [sic] gaps or cellular communication gaps do not overlap.” Ans. 3–4. And, according to the Examiner, “just like [Appellant’s] invention broadly claims[,] the gaps” in Sharma “are configured for either cellular communication or D2D communication.” Ans. 4.

In the Reply Brief, Appellant argues that the Examiner misinterprets the claim language because “[t]he claims at issue do not refer to ‘D2D communication gaps’ or ‘cellular communication gaps,’” or “whether [they] ‘overlap.’” Reply Br. 4. Rather, according to Appellant, “[t]he language of the claims is clear - during these periods, the D2D device need not worry about receiving signals from the cellular communication system, but can dedicate its receiver to D2D operations, i.e., to listening to signals or control information from other D2D devices.” Reply Br. 4. Appellant then argues that, in addition to misinterpreting the claims, the Examiner also misinterprets the Sharma reference. Reply Br. 5–8. Appellant explains that “[d]uring Sharma’s transmission gaps, Sharma’s mobile telephones (i.e., D2D devices) do not engage in D2D communication with each other,” but instead listen for and actually find cellular signals. Reply Br. 6. In contrast, according to Appellant, during “[t]he gaps recited in the pending claims, . . . the D2D device is not expected to receive cellular signals but can instead use its receiver to detect D2D signals from other D2D devices.” Reply Br. 6. For the reasons that follow, we are not persuaded of Examiner error.

Appellant’s arguments rest largely on the purported inadequacies of Sharma’s D2D transmission gaps, during which there are no D2D transmissions, but a cellular network may be searched for and found. But Appellant fails to consider what Sharma’s D2D transmission gaps suggest regarding when cellular communication is not expected. While Appellant is correct that a cellular signal may be expected during these D2D transmission gaps, Sharma also describes gaps in cellular communication service during which mobile telephones can establish and use D2D service instead. *See, e.g.,* Sharma ¶ 57 (“[W]hen they are outside of the cellular network, and still within communication distance from each other, the mobile telephones 3 can establish a D2D service without having to rely on the base station 5.”), Fig. 5 (item s501). As the Examiner points out, just like Appellant’s invention, which describes D2D and cellular communication gaps that do not overlap (that alternatively, could be described as periods of cellular transmission and D2D transmission, respectively), Sharma’s “gaps are configured for either cellular communication or D2D communication.” Ans. 4. Indeed, Sharma describes switching between D2D service and LTE cellular service, which at least suggests that when one type of service is being provided, the other type is not being provided. *See, e.g.,* Sharma ¶¶ 75 (explaining that network monitoring modules in mobile device do not operate “while D2D communication is occurring”), 77 (describing keeping D2D transmission gaps—i.e., the periods during of cellular communication—as short as possible “to ensure that they do not have significant impact on the D2D data/voice communication”), 108 (noting “that the network search, as indicated at steps s403 and s503, might be performed by the mobile telephone . . . periodically”).

Sharma therefore suggests that before and after its D2D transmission gaps, there are gaps in cellular communication (i.e., cellular communication between the mobile telephones and the base station is not occurring and, thus, “is not expected”), during which there is ongoing D2D communication between the mobile telephones. In other words, Sharma at least suggests “obtaining configuration of gaps during which the D2D-enabled device is not expected to receive any cellular signal but can use a receiver chain to detect D2D signals or D2D-related control information,” as recited in claim 42.

The teachings and suggestions of Sharma are consistent with a plain reading of the claim language in view of Appellant’s Specification. Akin to the mobile telephones’ switching between D2D service and LTE cellular service in Sharma, Appellant’s Specification describes a device that periodically switches its single receiver chain between two types of reception—downlink (DL) cellular reception and D2D reception. *See, e.g.*, Fig. 4 (showing alternation between DL cellular reception and D2D measurement gaps), Spec. 4:20–22 (“[T]he receiving device may switch the single receiver chain between DL reception and D2D reception in D2D subframes.”), 9:15–17, 10:28–29, 16:14–16. And, as Appellant confirms, during the recited “gaps” of claim 42, “the D2D device need not worry about receiving signals from the cellular communication system, but can dedicate its receiver to D2D operations, i.e., to listening to signals or control information from other D2D devices.” Reply Br. 4. In other words, both Appellant’s invention and Sharma similarly describe a plurality of periods during which only one type of reception (cellular or D2D) is occurring, and there is a “gap” in the other type of reception.

Because the Examiner has shown that Sharma suggests the disputed claim language, we need not address whether Doppler does as well. Even so, we note that Doppler too suggests the disputed claim language. Figure 6 of Doppler, cited by Appellant in the Appeal Brief, is reproduced below.

FIG. 6 600

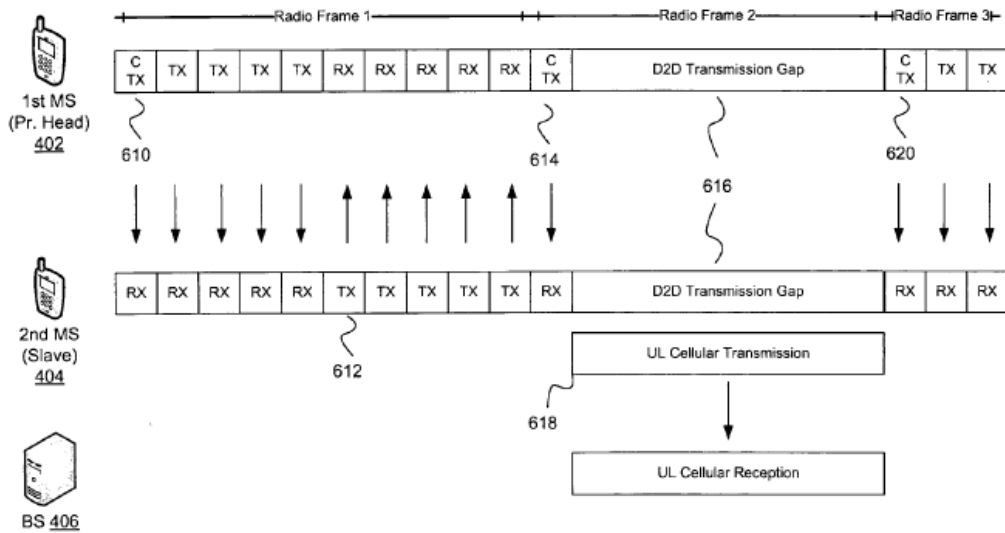


Figure 6 depicts a timing diagram according to an exemplary embodiment of Doppler. Doppler ¶ 52. This figure shows that during radio frames 1 and 3, only D2D communications occur (indicated by up and down arrows between transmission (Tx) and reception (Rx) sub-frames), whereas during radio frame 2—identified as D2D transmission gap 616—only cellular transmission 618 and reception occur. *See, e.g.,* Doppler ¶¶ 53–58. This suggests that, during radio frames 1 and 3, there are gaps in cellular communications such that the D2D-enabled device is “not expected” to receive any cellular signal but can use D2D signaling. And just as Appellant’s invention describes a device that switches its single receiver chain between DL cellular and D2D reception, Doppler too describes

Appeal 2019-003066
Application 14/437,038

switching between D2D and cellular communication modes. *See, e.g.*,
Doppler ¶¶ 26, 40, 57.

We therefore sustain the rejection of claims 33–39, 41–46, 48–55, and
57–62, and 64 as obvious in view of Doppler and Sharma. For the same
reasons, we also sustain the rejection of claims 40, 47, 56, and 63 as obvious
in view of Doppler, Sharma, and Pelletier.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	References	Affirmed	Reversed
33–39, 41–46, 48–55, 57–62, 64	103	Doppler, Sharma	33–39, 41–46, 48–55, 57–62, 64	
40, 47, 56, 63	103	Doppler, Sharma, Pelletier	40, 47, 56, 63	
Overall Outcome			33–64	

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with
this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R.
§ 1.136(a)(1)(iv).

AFFIRMED