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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte NICHOLAS WILLIAM WHINNETT

Appeal 2018-006697
Application 13/531,293
Technology Center 2600

Before ST. JOHN COURTENAY III, ELENI MANTIS MERCADER, and ALEX S. YAP, *Administrative Patent Judges.*

MANTIS MERCADER, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–7, 9–20, 22–25. Claims 8 and 21 are cancelled. *See* Final Act. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

[1] We use the word Appellant to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Intel Corporation. Appeal Br. 1.

CLAIMED SUBJECT MATTER

The claims are directed to a femtocell base station synchronization. Claim 1, reproduced below, is illustrative of the claimed subject matter:

> 1. A method of determining a timing estimate for use in synchronizing a femtocell base station to a macrocell base station, the method in the femtocell base station comprising:
>
> determining an uplink timing estimate from a signal transmitted from a mobile device to the macrocell base station, the mobile device being served by the macrocell base station;
>
> determining a downlink timing estimate from a signal transmitted from the macrocell base station to the mobile device;
>
> determining a timing estimate for use in synchronizing the femtocell base station to the macrocell base station from the downlink timing estimate and the uplink timing estimate, wherein the timing estimate is an estimate of propagation delay between the macrocell base station and the femtocell base station; and
>
> adjusting timing of the femtocell base station, thereby reducing an impact of the propagation delay.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Han	US 2010/0054237 A1	Mar. 4, 2010
Xu	US 2011/0034174 A1	Feb. 10, 2011
Guvenc	US 2012/0003985 A1	Jan. 5, 2012
Soliman	US 2012/0115496 A1	May 10, 2012

REJECTIONS

Claims 1–5, 9–18 and 22–25 stand rejected under 35 U.S.C. §103(a) as being unpatentable Soliman in view of Guvenc and further in view of Han.

Claims 6, 7, 19, and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Soliman, Guvenc, Han, and further in view of Xu.

OPINION

To the extent consistent with our analysis below, we adopt the Examiner's findings and conclusions in (i) the Final action from which this appeal is taken and (ii) the Answer.

Claims 1–5, 9–18 and 22–25 stand rejected under 35 U.S.C. §103(a) as being unpatentable Soliman in view of Guvenc and further in view of Han.

Appellant argues that the Examiner wrongly relies on Han, specifically paragraph 21 for teaching the limitation of "wherein the timing estimate is an estimate of propagation delay between the macrocell base station and the femtocell base station." Appeal Br. 7. Appellant explains that Han states

> [T]he measured clock difference between the femto-cell Node Band the macro-cell base station is equal to the sum of their actual clock difference and a propagation delay, d2/c. By having the femto-cell adjust its clock by the measured offset, the clock difference is reduced to the propagation delay, which it not easy to estimate accurately. But fortunately, it is not necessary to calibrate the propagation delay out.

Id. (citing Han, para. 21). Appellant asserts that Han teaches away from the claimed subject matter of estimating propagation delay by admitting that it is not easy to estimate the propagation delay and does not calibrate the propagation delay out. *Id.*

We do not agree with Appellant's argument. We agree with the Examiner that Han teaches that the system synchronizes its internal oscillator based on a measurement from a macro-cell base station. Ans. 3 (citing para. 21). We also agree with the Examiner's finding that taking a

measure for an oscillator to adjust a clock is a measurement of time that falls within a broadest reasonable interpretation of "timing estimate" as that term is understood by one of ordinary skill in the art, i.e., a measurement with respect to the timing of the device. *Id.* We further agree with the Examiner that Han teaches this measurement for creating an offset between the macrocell and the femtocell is based on the actual clock difference between the macrocell and the femtocell, which reduces to (becomes an estimate of) their propagation delay. *Id.* We further agree with the Examiner that while Han may state situations when calculating that delay may not be "necessary" that doesn't mean Han doesn't disclose having a synchronization based on an estimate of timing delay. *Id.* at 3–4. Han teaches that "it corrects its frequency offset and measures the time difference which is the sum of the clock error and *the propagation delay* from the macro-cell BS to the home BS" (emphasis added). *Id.* at 4 (citing para. 25). The Examiner notes, and we agree that a "Home BS" (i.e., Home Base Station) is another term understood by one of ordinary skill in the art to mean "femtocell." *Id.* (citing para. 20 where the home node "provides femto-cell coverage").[2]

Appellant further argues with respect to claims 2 and 15, that Soliman teaches that some sequences are repeated, but does not describe the step of the femtocell identifying repeated portions, not to mention that the repeated

[2] *See also* Spec. ¶ 2: "Femtocell base stations in a Long Term Evolution (LTE) communication network (otherwise known as Home evolved Node Bs - HeNBs - or Enterprise evolved Node Bs - EeNBs) are small, low-power, indoor cellular base stations for residential or business use. They provide better network coverage and capacity than that available in such environments from the overlying macrocellular LTE network. Femtocell base stations use a broadband connection to receive data from and send data back to the operator's network (known as 'backhaul')."

portions being a cyclic prefix at the start of a symbol and a final portion of the symbol corresponding to the cyclic prefix, as claimed. Appeal Br. 7–8.

> We do not agree. We agree with the Examiner's finding that
>
> Solliman states at ¶¶ 57–58 that in "sniff[ing]" a packet data is extracted from the packet such as "extract signatures" (this is consistent with one type of "sniffing" as that term is understood in the art (i.e., to examine packets, listen in on them, etc ...). The analysis of the extracted information may be used for timing information. ¶ 68 states that the sniffing may be used to determine if the packet is a PRACH preamble. This "determin[ation]" may be made "based on the packet structure of each of the transmissions". ¶¶ 70–71 state that the PRACH preamble, which is part of the packet structure, is made up of sixteen possible preambles *signatures, "[e]ach signature is made up of a 16-chip sequence repeated 256 times.}* If the system extracts a signature from a packet and the determination that said information is actually a signature is made based on the structure of that packet, i.e., the structure of its preamble, and the repeated sequences are what allows the system to determine which signature is being used and that the structure is a signature, this would be the system "identifying" repeated portions in the signal.

Ans. 4. In particular, we agree with the Examiner's finding that Soliman teaches that in "sniff[ing]" a packet data is extracted from the packet such as "extract signatures." Ans. 4 (citing paras. 57, 58). The analysis of the extracted information may be used for timing information such that the sniffing may be used to determine if the packet is a PRACH preamble. Ans. 4, para. 69.[3] We agree with the Examiner, that the femtocell determines the type of transmission based on the packet structure

[3] The Examiner cites to paragraph 68 of Soliman, we consider this an inadvertent error as paragraph 69 teaches that sniffing may be used to determine if the packet is a PRACH preamble.

of each of the transmissions. Ans. 4 (*see* para. 69). The PRACH preamble, which is part of the packet structure, is made up of sixteen possible preambles *signatures, "[e]ach signature is made up of a 16-chip sequence repeated 256 times.*" Ans. 4 (citing paras. 70–71). Thus, we agree with the Examiner's finding if a system extracts a signature from a packet and determines that it is a signature based on the structure of the packet, i.e. the structure of the preamble and repeated sequences, to determine which signature is being used, then the system is "identifying" repeated portions of the system. *See* Ans. 4. Accordingly we agree that Soliman teaches the disputed limitation of claims 2 and 15.

Appellant further argues that Guvenc paragraphs 18 and 30 do not teach the limitation of "wherein the estimate of the propagation delay is determined from a difference between the downlink timing estimate and the uplink timing estimate" as recited in claim 9 and similarly recited in claim 22. Appeal Br. 8.

We do not agree with Appellant. We agree with the Examiner that Guvenc teaches *inter alia* that the same techniques are used to calculate uplink delays as are used to calculate downlink delays. Ans. 5 (citing paras. 19 and 26). We further agree with the Examiner that Guvenc teaches that delays between two different links can be calculated. *Id.* (citing paras. 19 and 30). Accordingly, we further agree with the Examiner that it would have been obvious to combine the teachings of Guvenc with Soliman and Han to have a system where there is a measurement of a "delay from a difference between a downlink timing estimate and an uplink timing estimate." *Id.*

We are not persuaded by Appellant's argument that claims 11 and 24 are patentable because the Examiner did not address sections (ii) or (iii) of

the claims because as pointed out by the Examiner sections (i), (ii), and (iii) are recited as alternatives in the claimed language and the prior art only needs to meet one of these sections. *See* Appeal Br. 9; Ans. 6. The Examiner relied on Soliman's paragraph 48 to meet section (i) of these claims. Ans. 6.

Accordingly, we affirm the Examiner's rejections of claims 1–5, 9–18 and 22–25.

Claims 6, 7, 19, and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Soliman in view of Guvenc and further in view of Han and further in view of Xu.

Appellant does not present any separate, substantive arguments with respect to these claims. Arguments not made are waived. *See* 37 C.F.R. § 41.37(c)(1)(iv). Accordingly, we also affirm the Examiner's rejections of claims 6, 7, 19, and 20.

CONCLUSION

The Examiner's rejection is Affirmed.

DECISION SUMMARY

Claims Rejected	**35 U.S.C. §**	**Reference(s)/Basis**	**Affirmed**	**Reversed**
1–5, 9–18, 22–25	103(a)	Soliman in view of Guvenc and further in view of Han	1–5, 9–18, 22–25	
6, 7, 19, 20	103(a)	Soliman in view of Guvenc and further in view of Han and Xu	6, 7, 19, 20	
Overall Outcome:			1–7, 9–20, 22–25	

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