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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/218,298	08/31/2005	Zhike Jia	15962.4014	7501

96818 7590 01/24/2013
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EXAMINER
NGUYEN, NGA X

ART UNIT	PAPER NUMBER
3646	

NOTIFICATION DATE	DELIVERY MODE
01/24/2013	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ZHIKE JIA and CHI-SHIN WANG

Appeal 2011-000563
Application 11/218,298
Technology Center 3600

Before MICHAEL C. ASTORINO, LYNNE H. BROWNE, and SCOTT A. DANIELS, *Administrative Patent Judges*.

ASTORINO, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134 from the Examiner's decision finally rejecting claims 1, 4, 6-12, 14, 17, and 19-25.[1] Claims 2, 3, 5, 13, 15, 16, 18, and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. We have jurisdiction over the appeal under 35 U.S.C. § 6(b). An oral hearing was held on January 7, 2013.

We REVERSE.

Rejections

The following Examiner's rejections are before us for review.

Claims 1, 4, 6-8, 14, 17, 19, and 20 are rejected under 35 U.S.C. § 103(a) as unpatentable over Dong-Sik (US 2005/0008106 A1, publ. Jan. 13, 2005) and Kagemoto (US 6,392,590 B1, iss. May 21, 2002).

Claims 9-12 and 21-25 are rejected under 35 U.S.C. § 103(a) as unpatentable over Dong-Sik, Kagemoto, and Yang (US 6,407,699 B1, iss. Jun. 18, 2002).

Claimed Subject Matter

Claims 1 and 14 are the independent claims on appeal. Claim 1, reproduced below, is illustrative of the subject matter on appeal.

> 1. A method for tracking received signals in a global satellite navigation receiver, the method comprising:
>
> collecting a sequence of correlation values derived from the received signals correlated with PN codes;
>
> partitioning the collected sequence into N groups of consecutive correlation values, where N is a positive integer;

[1] The Examiner indicated dependent claims 13 and 26 as allowable. *See* Ans. 7.

> calculating from each of the N groups, a corresponding set of N values forming a down[-]sampled sequence;
>
> converting the down-sampled sequence from time domain to frequency domain to produce a frequency domain sequence;
>
> identifying a maximum power value in the frequency domain sequence;
>
> calculating a frequency error between the received signals and a locally generated replica signal based on the identified maximum power value; and
>
> adjusting a local replica carrier frequency by an amount equal to the frequency error.

Claim 14 calls for a global satellite navigation system receiver device including a "processor [that] essentially performs the steps of the method recited in independent Claim 1." App. Br. 4. *See id*., Claims Appendix.

OPINION

The Examiner finds that Dong-Sik discloses 16 groups where each group includes 16 samples of I and Q value pairs and that this disclosure corresponds to the partitioning step of claim 1. Ans. 3 (citing Dong-Sik, para. [0041]). The Examiner then finds that the next step of claim 1, i.e., the first calculating step, is also disclosed by Dong-Sik. More specifically, the Examiner finds that:

> "[c]alculating from each of the N groups, a corresponding set of N values forming a down[-]sampled sequence" [as recited in claim 1] is met by the teaching [of Dong-Sik] that an adder 27 accumulates the I & Q samples (e.g. Fig A) for each of the 16 groups, to calculate from each of the N=16 groups, a corresponding set of variation values (I' +Q') (see page 3, paragraph 41 & page 4, paragraph 51), *then reduce the dataset by collect* [sic] *whether a peak exists in the 16 samples of I & Q values* (see page 5, paragraph 51). *Alternatively*, to further

> reduce the dataset the sampled I & Q values are reduced by a *fractional multiplier*, such as by ½, ¼, etc. prior to its filtering and processing by the filter (see page 5, paragraph 52).

Ans. 3 (emphasis added).

For the purposes of this appeal only, even if it is assumed that Dong-Sik includes a calculation that "reduce[s] the dataset by collect [sic] whether a peak exists in the 16 samples of I & Q values (see page 5, paragraph 51)" (*id*.) and the identification of a peak does result in a down-sampled sequence, then Dong-Sik would then have to disclose the claimed converting step called for by claim 1. Claim 1 recites "converting *the down-sampled sequence* from time domain to frequency domain to produce a frequency domain sequence."[2] App. Br., Claims Appendix (emphasis added). As such, the Examiner identified "reduced dataset" of Dong-Sik would then be required to be converted from the time domain to frequency domain to produce a frequency domain sequence to correspond to the converting step of claim 1.

As stated above the Examiner relies on Dong-Sik's paragraph 51 to disclose the calculating step as called for by claim 1. Paragraph 51 describes an embodiment where the "[e]xistence of a peak can be determined by the variation values transformed by the [Fast Fourier Transform or] FFT unit 20 when compared against a value predetermined to define the existence of a peak." As for the converting step as called for by claim 1, the Examiner finds that "'[c]onverting the down sampled sequence from time domain to frequency domain to produce a frequency domain sequence' is met by

[2] Claim 14 recites "converts *the down-sampled sequence* from time domain to frequency domain to produce a frequency domain sequence." App. Br., Claims Appendix (emphasis added)

storing variation data values in a memory. The data is processed by the FFT unit (see page 5, paragraph 53)." Ans. 4.

However, as explained in paragraph [0053], Dong-Sik discloses an embodiment where the existence of a peak may include the following:

> [u]pon reaching N samples of I and Q value pairs, at step 76, the accumulated modified I and Q values (variation values) are stored in memory 15 (step 77). The stored data is processed by the FFT unit **20** at step **78** and the FFT transformed value is compared against a given threshold to determine whether the maximum value is a peak value (step **79**). Then, the I and Q values are stored when the value is maximum for phase offset of the code NCO **18** (step **80**). Upon determination that a peak exists at step **81**, the navigation processor **7** calculates pseudoranges, phase offset, etc. at step **83**. When a peak does not exist at step **81**, the process returns to step **71** to determine a next searching frequency and code delay value (step **82**).

As such, paragraphs [0051] and [0053] disclose that the FFT unit converts stored data (variation values) to identify a peak, and it is the identification of this peak that the Examiner includes in the identified reduced dataset. As discussed above, the Examiner identifies this reduced dataset as corresponding to the claimed down-sampled sequence. As such, the Examiner finds that when the stored data is transformed by FFT unit 20 this conversion corresponds to aspects of the calculating step of claim 1 and also corresponds to the conversion step of claim 1. However, claim 1 requires that the calculating step forms a down-sampled sequence and that this formed down-sampled sequence is converted to produce a frequency domain sequence in the subsequent converting step. Hence, the Examiner's application of Dong-Sik's disclosure to the first calculating step and the

subsequent converting step as called for by claim 1 is not adequately supported. *See* Reply Br. 5.

As for the Examiner's alternative finding that "the sampled I & Q values are reduced by a fractional multiplier" (Ans. 3), the Appellants point out that paragraph [0052] of Dong-Sik "describes a data-reduction operation on the number of bits per correlation sample. However[,] this does not teach or suggest reducing the number of samples." Reply Br. 5. *See also* App. Br. 7. Indeed, since the number of samples is not reduced, Dong-Sik's data reduction operation does not form a down-sampled sequence as called for by claim 1.

The Examiner does not find that Kagemoto teaches either the first calculating step or the subsequent converting step as called for by claim 1. *See* App. Br. 8. Hence, the Examiner does not point out how the teachings of Kagemoto might remedy the deficiency in the disclosure of Dong-Sik as pointed out in connection with the rejection of claim 1. Thus, the rejection of claim 1 and its dependent claims as unpatentable over Dong-Sik and Kagemoto is not sustained. For similar reasons, the rejection of claim 14 and its dependent claims as unpatentable over Dong-Sik and Kagemoto is not sustained.

The rejection of Dong-Sik, Kagemoto, and Yang relies on the same inadequately supported findings regarding Dong-Sik disclosing the first calculating step and the subsequent converting step as called for by claims 1 and 14. As such, we cannot sustain the rejections under 35 U.S.C. § 103(a) of claims 9-12 and 21-25 as unpatentable over Dong-Sik, Kagemoto, and Yang.

DECISION

We REVERSE the rejections of claims 1, 4, 6-12, 14, 17, and 19-25.

REVERSED

Klh