

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ELIE J. BAGHDADY

Appeal No. 2001-0603
Application 09/028,063

ON BRIEF

Before HAIRSTON, FLEMING, and GROSS, **Administrative Patent Judges**.

FLEMING, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 2, 4, 13, 15, 17 and 19 through 21. Claims 1 and 6 through 12 have been canceled. Claims 3, 5, 14, 16 and 18 have been allowed.

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The invention is directed to solving the problem of determining the direction of arrival of a spread spectrum signal from among the various spread frequency components within the bandwidth of the spread spectrum signal using an array of signal sensing elements. See Appellant's specification, page 2.

Independent claim 2 is reproduced as follows:

2. A method of determining the direction of arrival of a traveling spectrally spread signal wavefront of measurable center-frequency wavelength, comprising the steps of :

employing an array of signal-sensing elements;

taking the differences between the outputs of pairs of spaced elements;

taking the output of a signal element and shifting it in frequency by an amount f_{if} Hz and inverting its instantaneous envelope waveform;

multiplying each of said differences between outputs by said frequency-shifted, inverted-envelope single-element output, and selecting the product components at f_{if} Hz;

detecting the amplitude of each of said product components at f_{if} Hz; and

determining said direction of arrival from detected amplitudes of said product components.

References

The references relied on by the Examiner are as follows:

Green et al. (Green)	3,939,477	Feb. 17, 1976
Baghdady	4,513,249	Apr. 23, 1985
Tong	4,809,012	Feb. 28, 1989

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Rejections At Issue

Claims 2, 4, 13, 15, 19 and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Green and further in view of Baghdady. Claims 17 and 21 stand rejected under 35 U.S.C. § 103 as being unpatentable over Tong in view of Baghdady.

Rather than repeat the arguments of Appellant or the Examiner we make reference to the brief and answer the respected details thereof.

OPINION

With full consideration being given to the subject matter on appeal, the Examiner's rejections and the arguments of Appellant and the Examiner for the reason state *infra*, we reversed the Examiner's rejection of claims 2, 4, 13, 15, 17 and 19 through 21 under 35 U.S.C. § 103.

We will first address the rejection of claims 2, 4, 13, 15, 19 and 20 under 35 U.S.C. § 103 as being unpatentable over Green in view of Baghdady. The Examiner states that Green discloses an adcock type array, but does not disclose the detection of a spectrally spread signal and the problems encountered in detecting these type of signals. See page 3 of the Examiner's answer. Examiner states that Baghdady teaches a method for

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detection of spectrally spread signals. See page 3 of the Examiner's answer. The Examiner further states that it would have been obvious to one of ordinary skill in the art to provide the detection of spectrally spread signals as taught in Baghdady for use in direction finding equipment such as disclosed in Green by the suggestions in Baghdady of the application to detection of spectrally spread signals in a direction finding system. See page 4 of the Examiner's answer.

Appellant points out that independent claims 2 and 13 are directed to a method and apparatus for determining the direction of arrival of a traveling spectrally spread signal wavefront of measurable center-frequency wavelength, wherein an output of a signal element in an array of signal-sensing elements is shifted in frequency, and its instantaneous envelope wavelength is inverted. Appellant points out such features reflect the use of an inverting envelope waveform means, as defined on specification page 13, for transforming the combined envelope and exponent (phase or frequency) modulated signal. Appellant further points out the use of a frequency shifted, inverted envelope single element output permits the direction of arrival of a spectrum signal wavefront to be determined, even though the direction of

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arrival information may have become masked with the spreading of the signal over the spectrum. See pages 5 and 6 of the Appellant's brief.

Appellant argues that there is no motivation or reason to combine the Green and Baghdady. Appellant points out that Green is not directed to determining the direction of the arrival of a traveling spectrally spread signal wavefront. Appellant points out that Baghdady is directed to detecting a signal in the presents of signals having arbitrary modulation for the use of anti-jamming circuitry. See pages 6 and 7 of the Appellant's brief. Appellant argues that Green and Baghdady, either individually or in combination, fail to teach or suggest Appellant's claimed invention of detecting the direction of arrival of an instant wavefront where the constituents of the signal itself mask the direction of the arrival of information.

As pointed out by our reviewing court, we must first determine the scope of the claim "[T]he name of the game is the claim." *In re Hiniker Co.*, 150 F.3d 1362, 1369, 47 USPQ2d 1523, 1529 (Fed. Cir. 1998). In addition, claims are to be interpreted as the terms reasonably allow. *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

We note that Appellant's claim 2 recites "[a] method of determining the direction of arrival of a traveling spectrally spread signal wavefront of measurable center-frequency wavelength, comprising the steps of: . . . taking the output of a single element and shifting it in frequency by an amount f_{if} Hz and inverting its instantaneous envelope waveform . . . determining said direction of arrival from detected amplitudes of said product components." Similarly we note that Appellant's claim 13 is "an apparatus for determining the direction of arrival of a traveling spectrally spread signal wavefront of measurable center-frequency wavelength, comprising means for taking the output of a single element and shifting it in frequency by an amount f_{if} Hz and inverting its instantaneous envelope waveform resulting in an auxiliary modulation-wipeoff signal . . . means for determining said direction of arrival from detected amplitudes of said product components." Thus Appellant's claims 2, 4, 13, 15, 19 and 20 recite a method or apparatus for determining direction of arrival of a traveling spectrally spread signal wavefront of measurable center-frequency wavelength, wherein an output of a single element in and array of signal-sensing elements is shifted in frequency, and its instantaneous envelope waveform is inverted.

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In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of establishing a **prima facie** case of obviousness. **In re Oetiker**, 977 F.2d 1443, 1445, 24 USPQ 1443, 1444 (Fed. Cir. 1992). See also **In re Piasecki**, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). The Examiner can satisfy this burden by showing that some objective teaching in the prior art or knowledge generally available to one of ordinary skill in the art suggests the claimed subject matter. **In re Fine**, 87 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Appellant. **In re Oetiker**, 977 F.2d at 1445, 24 USPQ at 1444. **See also Piasecki**, 745 F.2d at 1472, 223 USPQ at 788.

An obviousness analysis commences with a review and consideration of all the pertinent evidence and arguments. "In reviewing the [E]xaminer's decision on appeal, the Board must necessarily weigh all the evidence and arguments." **In re Oetiker**, 977 F.2d at 1445, 24 USPQ2d at 1444. "[T]he Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which

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the findings are deemed to support the agency's conclusion." **In re Lee**, 277 F.3d 1338, 1344, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002).

Upon careful review, we fail to find that the Examiner has provided the requisite findings in Green or Baghdady of a method or apparatus for determining the direction of arrival of a traveling spectrally spread signal wavefront of measurable center-frequency wavelength wherein an output of a single element in an array signal-sensing elements is shifted in frequency, and its instantaneous envelope waveform is inverted. As the Examiner correctly states and Appellant argues, Green does not disclose determining the direction of arrival of a traveling spectrally spread signal wavefront of measurable center-frequency wavelength. We note further that Green teaches a quadrupole adcock antenna system. See column 1, lines 20 through 62. We further note that Appellant discloses in the Appellant's specification that adcock arrays or structures are well known prior art systems. See pages 1 and 2 of Appellant's specification.

Turning to Baghdady, we note that Baghdady teaches methods

and devices useful in separating the strongest of a plurality of linearly combined signals and suppressing the strongest frequency for the purpose of defeating electronic jamming. See Baghdady, column 1, lines 9 through 17. Baghdady further teaches that the methods and techniques may be employed in the on-line measurement of relative powers of a desired signal and undesired signal or noise powers. See column 1, lines 17 through 20. However, we do not agree with the Examiner that Baghdady is at all concerned with the problem of determining the direction of arrival of a traveling spectrally spread signal of wavefront of measurable center-frequency wavelength.

We find that there would have been no motivation, suggestion or reason for those skilled in the art to have used the features of the anti-jamming circuitry of Baghdady in the direction finding equipment disclosed in Green to obtain a method or apparatus for determining the direction of arrival of a traveling spectrally spread signal wavefront of measurable center-frequency wavelength. At best, those skilled in the art would only be directed to using the Baghdady's approach to distinguish extraneous noise from a single spectrum line signal which carries information data that identify the direction of arrival of the instant wavelength. Therefore, we will not sustain the

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Examiner's rejection of claims 2, 4, 13, 15, 19 and 20 as being unpatentable over Green in view of Baghdady under 35 U.S.C. § 103.

Now we turn to the rejection of claims 17 and 21 under 35 U.S.C. § 103 as being unpatentable over Tong in view of Baghdady. The Examiner states that Tong discloses direction finding equipment using phase difference components. However, Tong does not disclose detection of spectrally spread signal and the problems encountered in detecting these types of signals. See page 4 of the Examiner's answer. Similar to the above rejection, the Examiner argues that Baghdady teaches a method detecting spectrally spread signals and it would be obvious to combine this teaching with Tong to obtain Appellant's claimed invention. See page 4 of the Examiner's answer.

Appellant argue that as was the case with Green, Tong is not directed to determining the direction of arrival of a traveling spectrally spread signal wavefront. Appellant argues that there would have been no motivation or suggestion for one skilled in the art to have combined the features of the anti-jamming circuitry of Baghdady with the direction finding equipment of the Tong. See page 8, of the Appellant's brief.

We note that Appellant's claim 17 recite "[a]n apparatus for

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determining the direction of arrival of a traveling spectrally spread signal wavefront of measurable center-frequency wavelength, comprising . . . means for taking the output of a single element and shifting it in frequency by an amount f_{if} Hz, and inverting its instantaneous envelope waveform, resulting in an auxiliary modulation-wipeoff signal . . . means for determining said direction of arrival from said detected phase differences." Thus, Appellant's claim 17 recited an apparatus for determining direction arrival of a traveling spectrally spread signal wavefront of measurable center-frequency wavelength wherein an output of a single element of array of signal-sensing elements is shifted in frequency, and its instantaneous envelope waveform is inverted.

For the same reasons we have pointed out above we fail to find that Baghdady teaching of a method and apparatus for distinguishing extraneous noise from a single spectrum line signal would not have directed those skilled in the art to modify Tong to obtain the claimed apparatus as recited in Appellant's claims 17 and 21.

In view of the foregoing, we will not sustain the rejection

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of claims 2, 4, 13, 15, 17, and 19 through 21 under 35 U.S.C.
§ 103.

REVERSED

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Administrative Patent Judge)	
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)	BOARD OF PATENT
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