

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte JUHA H.A. RAPELI

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Appeal No. 97-0780  
Application 08/330,265<sup>1</sup>

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ON BRIEF

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Before MARTIN, JERRY SMITH, and BARRY, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-20, which constitute all the claims in the application.

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<sup>1</sup> Application for patent filed October 27, 1994.

The disclosed invention pertains to a method and apparatus for simulating an RF multipath propagation channel. Such channels are known to suffer from problems of delay spread of the received signals, different attenuation properties of the multiple paths, and the Doppler shift of signals induced by movement between the transmitter and the receiver. A particular feature of the disclosed invention is that RF signals are written into memory at a first frequency and read from memory at a second frequency, which frequencies are related so as to simulate the Doppler shift of the signals.

Representative claim 1 is reproduced as follows:

1. A method for simulating an RF propagation channel, comprising the steps of:  
inputting an RF signal ( $f_{in}$ ) to a simulator;  
sampling the RF signal and writing a sample to a memory means at a write frequency ( $f_w$ );  
storing said sample in the memory means; and  
reading the sample from the memory means at a read frequency ( $f_{Ri}$ ) after a delay time ( $t_{di}$ ) from writing the sample to the memory means;  
wherein the delay time ( $t_{di}$ ) corresponds to a delay for the RF propagation channel and the difference between the write frequency ( $f_w$ ) and the read frequency ( $f_{Ri}$ ) corresponds to a Doppler shift in the frequency of the RF signal ( $f_{in}$ ) for the propagation channel.

The examiner relies on the following reference:

Argo et al. (Argo)	5,191,594	Mar. 2, 1993
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Claims 1-20 stand rejected under 35 U.S.C. § 103. As evidence of obviousness the examiner offers Argo taken alone.

Rather than repeat the arguments of appellant or the examiner, we make reference to the briefs and the answer for the respective details thereof.

### OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellant's arguments set forth in the briefs along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 11, 14, 15, 17 and 18. We reach the opposite conclusion with respect to claims 1-10, 12, 13, 16, 19 and 20.

Accordingly, we affirm-in-part.

Appellant has nominally indicated that the claims do not stand or fall together [brief, page 4], but he has not specifically argued the limitations of each of the claims. To the

extent that appellant has properly argued the reasons for independent patentability of specific claims, we will consider such claims individually for patentability. To the extent that appellant has made no separate arguments with respect to some of the claims, such claims will stand or fall with the claims from which they depend. Note In re King, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed. Cir. 1986); In re Sernaker, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983).

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the

examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

With respect to independent claim 1, the examiner points out that Argo teaches an RF multipath propagation channel simulator in which input data is sampled, processed in a simulator and output. The examiner notes that the simulator of Argo accounts for propagation delays, Doppler shift and time delay spread [answer, page 3]. The examiner concludes that the simulator taught by Argo would have suggested to the artisan the obviousness of the invention recited in claim 1. The examiner's position is either that the simulator of Argo inherently or implicitly performs the method of claim 1 because Argo accounts for Doppler shift and time delay spread parameters or that the method of claim 1 would have obviously been suggested based on the simulator of Argo.

Appellant argues that Argo does not teach the memory as recited in claim 1, and that Argo does not teach or suggest the relationship of parameters  $t_{di}$ ,  $f_w$  and  $f_{Ri}$  as recited in claim 1 [brief, pages 7-9].

We agree with appellant that Argo does not teach or suggest the simulation method as recited in claim 1. A key feature of claim 1 is that delay times  $t_{di}$  are selected to correspond to propagation channel delay times, and the difference between the write frequency  $f_w$  and the read frequency  $f_{Ri}$  corresponds to the Doppler shift in the frequency of

the RF signal for the propagation channel. In other words, claim 1 recites that the Doppler shift is achieved by selection of the write and read rates rather than by the typical mathematical algorithm. Argo suggests nothing about the relative rates at which sampled data should be written into memory or read from memory. The examiner's position that the relationship of the parameters recited in claim 1 would have been obvious to the artisan based on the Argo simulator is simply unsupported by Argo or any other evidence on this record.

For the reasons just discussed, we do not sustain the examiner's rejection of independent claim 1 as unpatentable over Argo taken alone. Since claims 2-10 depend from claim 1 and incorporate all the limitations of claim 1, we also do not sustain the rejection of dependent claims 2-10.

With respect to independent claim 19, the examiner applies Argo in the same manner as discussed above with respect to claim 1. Claim 19 specifically recites that a delay between writing and reading a stored sample is a function of propagation path delay, and that samples are stored and read at a first and second frequency which are related to the Doppler shift in the frequency of the RF signal for the simulated channel. As we noted above, Argo suggests nothing with respect to simulating Doppler shift by the relationship between a write frequency and a read frequency of the memory. Therefore, independent claim 19 is neither taught nor suggested by Argo for the same reasons discussed above.

Accordingly, we do not sustain the rejection of claim 19 or claim 20 which depends therefrom.

With respect to independent claim 11, the examiner asserts that the artisan would have found it obvious to “read out store receive signal after a delay at different frequency to simulate time delay spread signal because the receive signal introduced into by a fading profile such as time delay spread and Doppler spread would simulate the effect of fading channel [sic]” [answer, page 4]. Appellant basically argues that Argo would not have suggested the invention as recited in claim 11 [brief, pages 8-9].

We note that independent claim 11 is substantially broader than independent claims 1 and 19. Claim 11 does not define any relationship between the parameters  $t_{di}$ ,  $f_w$  and  $f_{Ri}$ . In other words, claim 11 only recites that samples are written into memory at a write frequency  $f_w$ , samples are read from memory at a read frequency  $f_{Ri}$ , and that the reading takes place at a time  $t_{di}$  after the writing. Claim 11 does not preclude the read and write frequencies from being the same or from differing in any random way.

We are of the view that the invention as broadly recited in claim 11 is suggested by the tapped delay line simulator described in Argo or shown in appellant’s admitted prior art [Figure 3]. First, we note that a tapped delay line was conventionally known to operate as

a memory means as recited in claim 11<sup>2</sup>. Second, the data in a tapped delay line is written into the memory before it is read from the memory so that there is some time  $t_{di}$  as recited in claim 11. Finally, when such delay lines are implemented in a digital fashion such as by a shift register, data is clocked into the tapped delay line at some frequency (the write frequency) and read from the delay line at some frequency (the read frequency). Since claim 11 places no restrictions on the relationship of the time delay, write frequency and read frequency, the tapped delay line of Argo (and appellant's admitted prior art) when implemented as a conventional digital shift register would have suggested the invention as broadly recited in claim 11. Therefore, we sustain the examiner's rejection of independent claim 11.

With respect to dependent claim 12, the examiner simply asserts that Argo implies a frequency down conversion process [answer, page 4]. We have been unable to find such a teaching or suggestion in Argo. Therefore, we do not sustain the rejection of claim 12 or of claims 13 and 16 which depend from claim 12. With respect to dependent claims 14, 15, 17 and 18, appellant simply asserts that these claims add limitations to claim 11 [brief, page 12]. Such an assertion is insufficient to have the claims considered separately for patentability. Since we have sustained the examiner's rejection of independent claim

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<sup>2</sup> See, for example, The New IEEE Standard Dictionary of Electrical and Electronics Terms, Fifth Edition, Copyright 1993 by IEEE, Inc., page 323 [copy attached to this decision].

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11, we also sustain the rejection of these dependent claims which are not separately argued.

In summary, the examiner's rejection of the claims under 35 U.S.C. § 103 is sustained with respect to claims 11, 14, 15, 17 and 18 but is not sustained with respect to claims 1-10, 12, 13, 16, 19 and 20. Accordingly the decision of the examiner rejecting claims 1-20 is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

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JOHN C. MARTIN	)
Administrative Patent Judge	)
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	) BOARD OF PATENT
JERRY SMITH	)
Administrative Patent Judge	) APPEALS AND
	)
	) INTERFERENCES
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