

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JOHN A. FEE and  
FRANK A. McKIEL JR.

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Appeal 2008-2492  
Application 11/265,575  
Technology Center 2600

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Decided: November 17, 2008

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Before JOSEPH F. RUGGIERO, JOHN A. JEFFERY,  
and KARL D. EASTHOM, *Administrative Patent Judges*.

EASTHOM, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Final Rejection of claims 105-155, the only claims pending (App. Br. 2). We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Appellants' invention relates to providing co-propagating supplemental signals with optical signals. Each supplemental signal is associated with a carrier frequency of an optical signal, and is typically lower in frequency than a high data rate signal also co-propagating with the optical carrier. The supplemental signal can be extracted from the optical signal to facilitate transmission verification of the optical signal through an optical network. (Spec. ¶¶ 0001, 0033; Abstract; Fig. 8).

Claims 111 and 124 are illustrative of the invention and read as follows:

111. An optical switch for facilitating the verification of optical path integrity, comprising:

a first optical signal port configured to receive a modulated optical signal that has a first supplemental signal originating external to the optical switch;

a second optical signal port;

an optical switching element configured to transmit the modulated optical signal from the first optical signal port to the second optical signal port; and

a supplemental signal injector coupled to the first optical signal port for adding a second supplemental signal associated with the modulated optical signal, wherein the modulated optical signal is produced by electrically modulating an electrical signal according to the first supplemental signal.

124. A method for verifying optical signal routing utilizing an optical switch, the method comprising:

routing an optical signal to a first port of the optical switch, wherein the optical signal has an attribute of known value conveyed by a component of the optical signal, wherein the component is superimposed onto the optical signal by electrically modulating an electrical signal;

directing the optical switch to couple the first port to a second port of the optical switch, wherein, at the second port of the optical switch, the attribute of the optical signal is sensed and a detected value for the attribute is determined; and

determining whether the optical signal is being routed correctly based at least upon whether the detected value agrees with the known value.

The Examiner relies on the following prior art references to show unpatentability:

Shiragaki	US 5,457,556	Oct. 10, 1995
Gerstel	US 5,867,289	Feb. 2, 1999
Fatehi	US 5,892,606	April 6, 1999
Konishi	US 6,101,010	Aug. 8, 2000
Fee	US 6,108,113	Aug. 22, 2000

Claims 124-127, 129, 131, 132, and 139 stand rejected as anticipated under 35 U.S.C § 102(b) by Konishi.

Claim 128 stands rejected as obvious under 35 U.S.C. § 103 based on Konishi.

Claims 105-110, 133, 134, and 140-142 stand rejected as obvious under 35 U.S.C. § 103 based on the collective teachings of Konishi and Shiragaki.

Claims 118-121, 130, and 150-153 stand rejected as obvious under 35 U.S.C. § 103 based on the collective teachings of Konishi and Fatehi.

Claims 122, 123, 154, and 155 stand rejected as obvious under 35 U.S.C. § 103 based on the collective teachings of Konishi, Fatehi and Shiragaki.

Claims 111-117, 135-138, and 143-149 stand rejected as obvious under 35 U.S.C. § 103 based on the collective teachings of Gerstel and Fee.

#### FINDINGS OF FACT (FF)

1. Konishi discloses an “oscillator 22 for generating the monitoring signal and a control circuit 23 for establishing a frequency of the oscillator 22.” (Col. 2, ll. 26-28). The output frequency of the oscillator signal varies from several kHz to several hundred kHz depending on the control circuit input, which correlates different signal frequencies to different optical transmission carrier wavelengths according to the control circuit (col. 2, ll. 17-36, Figs. 1, 2).

2. The output signal modulates the optical carrier via an optical modulator 21 (Konishi, Fig. 1).

3. Gerstel teaches adding separate optical supervisory signals to different associated optical carrier signals of different wavelengths in an optical switch in order to isolate a fault in an optical switch and associated circuitry, whereby absence of the supervisory signal indicates such a fault for the associated optical carrier (col. 1, ll. 5-9, 40-59; col. 4, ll. 51-60; col. 5, ll. 24-35).

4. Fee teaches intensity modulating an optical carrier with high frequency traffic data and with a supplemental sub-carrier modulation signal carrying ancillary network data (col. 5, ll. 38-48). The modulated sub-carrier signal facilitates multiple network functions related to successful transmission of the optical data carrier, including traffic control, wavelength mapping and re-use, link identification, operational status identification, performance evaluation, timing, synchronization, fault detection, bit-error rate correction, customer identification, and identification of the particular wavelength and data rate of each optical carrier carrying the sub-carrier (abstract; col. 5, ll. 53-59; col. 11, ll. 12-21; col. 11, l. 63 to col. 12, l. 6; col. 12, l. 59-67; Figs. 6a, 7b; *see also generally* col. 13-14 (e.g. - *see* Table 4 listing beneficial applications)).

5. Appellants admit that techniques for injecting sub-carrier signals upon optical carriers in the optical domain are disclosed in US Patent No. 5,956,165, (Spec. ¶ 0076) with similar techniques disclosed in US Patent No. 6,285,475 (Spec. ¶ 0033; Fig. 8).

6. Appellants cite the Specification at ¶¶ 0071, 0076, and 0077 and Figure 11 to support the claim 124 limitation: “wherein the component is superimposed onto the optical signal by electrically modulating an electrical signal” (App. Br. 4). The passages cited do not require or indicate specifically that the component itself is electrically modulated, but the passages indicate that the component modulates an optical carrier in the optical domain and carries information related to the optical carrier (*see* Spec. ¶¶ 0071, 0076, and 0077).

7. Appellants state that the “lower frequency subcarrier modulation” content of an optical signal is known from a disclosed system of prior art US

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Patent No. 5,956,165, and one embodiment of that system is depicted in Appellants' Specification as Figure 9 (Spec. ¶¶ 0036, 0037; Fig. 9).

## PRINCIPLES OF LAW

Appellants have the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006) ("On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.") (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)).

Under § 102, Appellants may sustain this burden by showing that the prior art reference relied upon by the Examiner fails to disclose an element of the claim. It is axiomatic that anticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim. *See In re King*, 801 F.2d 1324, 1326 (Fed. Cir. 1986); *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984).

Under § 103, a holding of obviousness can be based on a showing that "there was an apparent reason to combine the known elements in the fashion claimed." *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41 (2007). Such a showing requires:

"some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness" . . . [H]owever, the analysis need not seek out precise teachings directed to the

specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

*Id.*, 127 S. Ct. at 1741 (*quoting Kahn*, 441 F.3d at 987).

If the Examiner's makes such a showing, the burden then shifts to the Appellants to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

## ANALYSIS

### *Anticipation - Konishi*

Appellants' arguments regarding the anticipatory rejection of claims 124-127, 129, 131, 132, and 139 under Konishi are directed toward independent claims 124, 126 and 139 without distinction. (App. Br. 10-11). Therefore, we select claim 124 as representative of this group.

Appellants dispute (App. Br. 10) the Examiner's finding (Ans. 3-4) that Konishi discloses "wherein the optical signal has an attribute of known value conveyed by a component of the optical signal, wherein the component is superimposed onto the optical signal by electrically modulating an electrical signal" as recited by claim 124. In particular, Appellants maintain that Konishi's component is not "superimposed on the optical signal **by electrically modulating an electrical signal**" (App. Br. 10).

Issue: Does Konishi disclose electrically modulating an electrical signal?

The Examiner found (Ans. 3-4), and we concur, that Konishi's system electrically varies (i.e., modulates) an oscillator 22 frequency electrical signal as a function of electrical signals input to the oscillator 22 from a control circuit 23. (See FF 1). As the Examiner also found, Konishi's electrically modulated electrical signals (from oscillator 22) are each superimposed on particular optical carriers to convey optical carrier attribute information (i.e., the optical carrier frequency value). (See FF 1, 2, Ans. 3-4, 23).

Appellants counter that while Konishi's oscillator does specify a particular frequency, the *oscillator* does not modulate an electrical signal. (Reply Br. 3, emphasis added). Appellants' argument fails to address the Examiner's finding, with which we concur, that the control/oscillator circuit *combination* modulates an electrical signal as set forth in the claim. (See FF 1, 2, and 6). Appellants' disclosed system similarly supports superimposing a single frequency component onto an optical carrier. (See FF 6).

Appellants also argue that Konishi discloses electrically modulating an optical signal. (App. Br. 10). While we agree with Appellants, the claim does not preclude, and Appellants' disclosure similarly supports, such (additional) electrical modulation of an optical signal (*see* FF 5, 6).<sup>1</sup> Such similar optical modulation, by Konishi's optical modulator 21 (Fig. 1, FF 2), constitutes *part* of the means by which the component is "superimposed onto

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<sup>1</sup> Of course, an optical signal has both an electric and magnetic component (i.e., it is visible electromagnetic radiation). However, we understand Appellants' remarks concerning Konishi's electrical modulation of an optical signal (*see* App. Br. 10) to relate to modulating a light wave carrier, by varying, for example, the intensity of a laser, based on an electrical input to the laser. Appellants' system also electrically modulates light (i.e., in the optical domain (*see* FF 5)).

the optical signal” as required by the claim. Thus, as we found *supra*, because Konishi’s system electrically modulates an electrical signal and superimposes that signal on the optical carrier, it follows that Konishi’s system superimposes the signal/component by electrically modulating an electrical signal, thereby meeting the claim.

We finally note that while Appellants’ Brief points to certain portions of the Specification for support of the argued claim limitation (*see* FF 6), we find nothing in the portions cited that relate specifically to: “superimposing onto the optical signal by electrically modulating an electrical signal.”<sup>2</sup> Moreover, our reading of Appellants’ Brief and Specification indicates that any argued distinction, if it exists, is supported by admitted prior art (*see* FF 5-7, n.2 *supra*). Such an argument is contradicted and therefore vitiated by Appellants’ own admission even though the Examiner has not used the admission as evidence in rejecting the claimed invention. *See In re Reuning*, 2008 WL 1836711, at \*3 (Fed. Cir. 2008) (admitted prior art vitiates an argument directed to unobviousness); *see also Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1570 (Fed. Cir. 1988) (applicant’s statement that something is prior art is binding on applicant for determinations of anticipation and obviousness.); *In re Nomiya*, 509 F.2d 566, 577 n.5 (CCPA 1975) (applicant’s statement that certain matter is prior art is an admission that the matter is prior art for all purposes).

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<sup>2</sup> However, electrical modulation of an electrical signal/component is disclosed as prior art (*see* FF 5-7). *See also* Fee, discussed *infra*. But, no clear disclosure exists relating electrical modulation of an electrical signal to superimposing a component on an optical signal – the modulation of the electrical signal and the superimposition of the component are simply two separate functions.

In any case, as we found above, Konishi's signal (i.e., component), is modulated electrically, and the optical carrier is modulated in the optical domain, in a manner consistent with Appellants' disclosure, thereby meeting claim 124.

Accordingly, we sustain the Examiner's rejection of claim 124. We also sustain the Examiner's rejection of claims 125-127, 129, 131, 132, and 139, not separately argued.

*Obviousness – Konishi; Konishi with Shiragaki; Konishi with Fatehi, Konishi with Fatehi and Shiragaki.*

Appellants provide no additional patentability arguments directed to the Examiner's obviousness rejections based on Konishi for claim 128; the additional reference of Shiragaki for claims 105-110, 133, 134, and 140-142; the additional reference of Fatehi for claims 118-121, 130, and 150-153; and the additional references of Fatehi and Shiragaki for claims 122, 123, 154, and 155; but, instead reiterate the previously-noted deficiency regarding Konishi's alleged failure. (App. Br. 11-13). Since we have found no such deficiency, we will sustain the rejections of claims 105-110, 118-123, 128, 130, 133-134, 140-142, and 150-155 for the same reasons as indicated *supra* regarding claim 124.

*Obviousness – Gerstel and Fee*

With respect to representative claim 111, Appellants generally assert that the Examiner's obviousness determination lacks a sufficient finding of a teaching, suggestion or motivation to combine the references (App. Br. 13-16). Appellants also specifically contend that since Gerstel already employs supplemental signals, there would have been no reason to add Fee's supplemental signals. (App. Br. 15). Appellants also contend that claim 111

requires an association between the first and second supplemental signals because each are associated with the carrier. (App. Br. 15-16).

Issue: Did the Appellants demonstrate that the Examiner erred in finding that it would have been obvious to ordinarily skilled artisans at the time of the invention to add Fee's supplemental signals to Gerstel's system?

The Examiner found, and we generally concur, that Fee's well-known system simply injects supplemental signals to an optical carrier to facilitate multiple beneficial functions related to network management, including timing, wavelength re-use, noise and error rate analysis, customer identification, usage statistics, and link status (Ans. 18, 24, 25, *see* FF 4). As the Examiner also found, Gerstel's similar optical switch system employs supplemental signals for fault monitoring of the switch. (Ans. 24-25, FF 3).

Therefore, we find that the Examiner provided ample reason why Gerstel's optical *switch* monitoring system, processing optical signals such as Fee's, predictably would have benefited by further processing of Fee's optical signals carrying supplemental signals for full *network* analysis, contrary to Appellants' first contention *supra*. We also find that Fee's first and Gerstel's second supplemental signals are each associated with the optical carrier, including, *inter alia*, identification of the carrier, as generally found by the Examiner (Ans. 17, 18; FF 3, 4), contrary to Appellants' second contention *supra*. As such, the resulting combination would yield no more than the predictable use of prior art elements according to their established functions, and Appellants do not argue otherwise. This supports an obviousness conclusion. *See KSR*, 127 S. Ct. at 1740.

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Accordingly, we sustain the Examiner's rejection of claim 111. We also sustain the Examiner's rejection of claims 112-117, 135-138, and 143-149, not separately argued.

#### CONCLUSIONS

Konishi discloses electrically modulating an electrical signal. Appellants did not demonstrate that the Examiner erred in finding that ordinarily skilled artisans at the time of the invention would have found it obvious to add Fee's supplemental signals to Gerstel's system.

#### DECISION

We affirm the Examiner's decision rejecting claims 105-155.

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

AFFIRMED

KIS

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