The opinion in support of the decision being entered today is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte THOMAS L. WEAVER
and RONALD H. SMITH

Appeal 2007-2223
Application 09/975,168
Technology Center 2600

Decided: September 25, 2007

Before LEE E. BARRETT, MAHSHID D. SAADAT,
and JOHN A. JEFFERY, *Administrative Patent Judges*.

SAADAT, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a Final Rejection of claims 1-26, which are all of the claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Appellants have invented a method of transmitting optical signals over a multi-mode network bus in a closed-loop optical network system utilizing wavelength division multiplexing of signals (Specification 2).

Claim 1, which is representative of the claims on appeal, reads as follows:

1. A closed-loop optical network system comprising:

a multi-mode network bus for transmitting a plurality of optical signals;

a multiplexer capable of wavelength division multiplexing a plurality of input optical signals for transmission via the network bus, wherein the plurality of input optical signals have a plurality of predetermined optical wavelengths;

a plurality of remote devices optically connected to the network bus, wherein said plurality of remote devices are capable of reading optical signals having respective predefined optical wavelengths off of the network bus, and wherein said plurality of remote devices are further capable of writing optical signals having respective predefined optical wavelengths onto the network bus; and

a demultiplexer capable of receiving optical signals having at least one of the plurality of predetermined optical wavelengths from the network bus and thereafter wavelength division demultiplexing the optical signals into a plurality of output optical signals.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Polczynski	US 4,089,584	May 16, 1978
Sharma	US 5,717,795	Feb. 10, 1998

Stamatios V. Kartalopoulos (hereinafter Kartalopoulos), “Introduction to DWDM Technology: Data in a Rainbow,” IEEE Press, pp. 37, 41, 42, and 194, 2000.

The Examiner rejected claims 1-20 under 35 U.S.C. § 103(a) as unpatentable over Sharma and Kartalopoulos and claims 21-26 over Sharma, Polczynski, and Kartalopoulos.

ISSUES

(1) Under 35 U.S.C § 103(a), with respect to the appealed claims 1-20, would one of ordinary skill in the art at the time of the invention have found it obvious to combine Sharma and Kartalopoulos to render the claimed invention unpatentable?

(2) Under 35 U.S.C § 103(a), with respect to the appealed claims 21-26, would the ordinarily skilled artisan have found it obvious to modify the combination of Sharma and Polczynski with Kartalopoulos to render the claimed invention unpatentable?

FINDINGS OF FACT

The following findings of fact (FF) are relevant to the issues involved in the appeal and are believed to be supported by a preponderance of the evidence.

1. Sharma relates to an optical wavelength division multiplexed network system in which an optical fiber acting as a main trunk line interconnects a plurality of nodes in a ring form to permit communications between desired nodes, comprising a multi-wavelength light source for multiplexing and transmitting a plurality of lights having different wavelengths from a location in the network (Abstract; col. 2, ll. 55-62).

2. Sharma describes optical wavelength division multiplexed network systems based on the optical fiber ring system to be common in the field of optical communications (col. 1, ll. 11-16).

3. Sharma discloses a multi-wavelength light source 71 shown in Figure 6 includes a multi-mode laser 714 for emitting laser light corresponding to a plurality of longitudinal modes at a fixed wavelength interval, and a filter 715 for eliminating lights of unnecessary wavelengths from the laser light output from the multi-mode laser 714 (col. 6, ll. 40-45).

4. Kartalopoulos relates to optical waveguides and describes fiber the transporting medium of choice for voice, video, and data, particularly for high-speed communications (p. 37, ¶ 1).

5. Kartalopoulos describes some of the properties of multimode optical fibers as follows:

> "It is easy to splice and to couple light into.
> The bit rate is limited; up to 100 Mbps for lengths up to 40 km; shorter lengths support higher bit rates.
> Fiber span without amplification is limited; up to 40 km at 100 Mbps (extended to Gbps for shorter distances for graded-index)."
> (P. 42, § 3.4.1).

6. Kartalopoulos describes some of the properties of single mode optical fibers as follows:

> "It is more difficult to splice and to exactly align two fibers together.
> …
> It is suitable for transmitting modulated signals at 40 Gbps (or higher) and up to 200 km without amplification."
> (P. 42, § 3.4.2).

PRINCIPLES OF LAW

To reach a conclusion of obviousness under § 103, the Examiner bears the burden of producing factual basis supported by teaching in a prior art reference or shown to be common knowledge of unquestionable demonstration. Our reviewing court requires this evidence in order to establish a prima facie case. *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984).

Furthermore, the test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. *See In re Kahn*, 441 F.3d 977, 987-988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), *In re Young*, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991) and *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734, 82 USPQ2d 1385, 1391 (2007).

"The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Leapfrog Enter., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161, 82 USPQ2d 1687, 1691 (Fed. Cir. 2007) (quoting *KSR*, 127 S. Ct. at 1739-40, 82 USPQ2d at 1395). "One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of

invention a known problem for which there was an obvious solution encompassed by the patent's claims." *KSR*, 127 S. Ct. at 1742, 82 USPQ2d at 1397.

ANALYSIS

Rejection of Claims 1-20

Appellants mainly argue that the multi-mode light source in Sharma corresponds to a plurality of longitudinal modes whereas the multi-mode network bus recited in claim 1 operates in multiple transverse modes (Br. 6). Based on such interpretation, Appellants argue that since the number of longitudinal modes of a light source does not typically depend on the number of transverse modes of the bus, the multi-mode light source of Sharma does not necessarily suggest a multimode network bus (Br. 7). Appellants further challenge the use of the multimode fibers disclosed by Kartalopoulos in telecommunications systems such as that of Sharma and allege that there is not a legally sufficient justification for combining the disclosures of Sharma and Kartalopoulos (Br. 8-11).

With respect to the multimode light source disclosed by Sharma and whether it suggests a multimode network bus, the Examiner acknowledges that Sharma does not disclose a multimode network bus (Answer 12). However, the Examiner points out that the rejection is based on the combination of Sharma with Kartalopoulos, which provides for a multimode network bus to be used in Sharma (*id.*). In that regard, Appellants' arguments (Br. 7) characterizing Sharma's network bus as either a single mode or a multimode bus, based on the multiple longitudinal mode operation of the light source, does actually support the Examiner's position

relying on Kartalopoulos. Therefore, we agree with the Examiner (Answer 13-14) that while Sharma may not specify the fiber type, the reference does disclose using an optical fiber as the network bus for a multimode light source (FF 2) and that the fiber type may be determined by the choices described in Kartalopoulos between a single mode bus and a multimode bus based on the advantages of each bus type (FFs 4-6).

Appellants further argue that mere mentioning the properties of a multimode fiber in Kartalopoulos does not in itself support using multimode buses in telecommunications systems where in fact, using a single mode fiber for its bit rate and transmission distance is suggested (Br. 9). Again, we agree with the Examiner (Answer 15) that the disclosed fiber properties in Kartalopoulos, indicating the ease in splicing and coupling, does suggest using multimode fibers in applications requiring a span of up to 40 km at a bit rate of up to 100 Mbps (FF 5). We also find Appellants' attempt to rely on additional prior art references to establish the use of multimode fibers in telecommunications system as being contrary to the accepted wisdom in the art (Br. 8) to be immaterial.[1] As discussed above, although Kartalopoulos mentions the span over a larger distance as the benefit of using the single mode fiber, Kartalopoulos also provides other properties, such as ease in splicing and coupling, as the benefits of using a multimode fiber, when a larger fiber span is not critical (FFs 5 & 6).

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[1] Although we do not need to address these cited prior art, it is worth noting that one of the references (Liou, US 7,031,612 B2, Apr. 18, 2006) does support the Examiner's position by mentioning that the LAN communication fiber may be either multimode or single mode, depending on the distance the signal is to travel making the single mode more suitable for the long distance (col. 1, ll. 44-49).

Appellants further dispute the combinability of Sharma and Kartalopoulos based on the assertion that Sharma teaches away from using a multimode fiber since using the multimode fiber of Kartalopoulos in a telecommunications system is contrary to the accepted wisdom in the art (Br. 10; Reply Br. 4-5). The Examiner responds by relying on the benefits of using a multimode fiber in optical telecommunications networks as disclosed by Kartalopoulos and concludes that, in spite of the prior art cited by Appellants, one of ordinary skill in the art would have combined the references to achieve proper fiber splice and good light coupling (Answer 17). We agree with the Examiner. Additionally, contrary to Appellants' assertion (Reply Br. 4-5), a description of the problems in splicing or coupling the single mode fiber in Sharma is not required for the combination of Sharma and Kartalopoulos to be proper. As discussed above and conceded by Appellants, Sharma may use either a single mode fiber or a multimode fiber, which are suggested by Kartalopoulos based on the specific properties that are desired or acceptable for a particular application. In fact, since Kartalopoulos outlines the advantages and drawbacks of both single mode and multimode network buses (FF 4-6), one of ordinary skill in the art would have combined the references and used a multimode network bus in Sharma to benefit from the known and predictable properties of such multimode bus. *See KSR, surpa*.

Therefore, based on our analysis of the claims and the applied prior art, we find that one of ordinary skill in the art would have combined Sharma with Kartalopoulos in the manner suggested by the Examiner. Accordingly, we sustain the rejection claims 1-20 under 35 U.S.C. § 103 over Sharma and Kartalopoulos.

Rejection of Claims 21-25

With respect to the rejection of these claims, Appellants rely on the same arguments previously raised for claim 1 and assert that Polczynski adds nothing to the combination of Sharma and Kartalopoulos that would have made the subject matter of claims 21-26 unpatentable (Br. 11-12; Reply Br. 5). Therefore, in light of our findings above and the absence of specificity in Appellants' arguments, we find the Examiner's position that the teachings of Sharma, Kartalopoulos and Polczynski suggest the subject matter of Claims 21-25 to be reasonable. *See In re Young*, 927 F.2d 588, 590, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991). *See also* 37 C.F.R. § 41.37(c)(1)(vii).

CONCLUSION OF LAW

Because Appellants have failed to point out any error in the Examiner's position, we are affirming the 35 U.S.C. § 103 rejections with respect to claims 1-20 over Sharma and Kartalopoulos and with respect to claims 21-26 over Sharma, Kartalopoulos, and Polczynski.

DECISION

The decision of the Examiner rejecting claims 1-26 is affirmed.

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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