

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TOIVO T. KODAS, MARK J. HAMPDEN-SMITH, KAREL VANHEUSDEN, HUGH DENHAM, AARON D. STUMP, ALLEN B. SCHULT, PAOLINA ATANASSOVA and KLAUS KUNZE

Appeal 2008-3302
Application 10/265,070
Technology Center 1700

Decided: October 15, 2008

Before BRADLEY R. GARRIS, CHUNG K. PAK, and TERRY J. OWENS
Administrative Patent Judges.

OWENS, *Administrative Patent Judge.*

DECISION ON APPEAL
STATEMENT OF THE CASE

The Appellants appeal from a rejection of claims 17-54, which are all of the pending claims. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

The Invention

The Appellants claim a method for fabricating an inorganic resistor. Claim 17 is illustrative:

17. A method for the fabrication of an inorganic resistor on a substrate, comprising the steps of:

- (a) providing a substrate;
- (b) depositing a resistor precursor composition onto said substrate using a direct-write tool, said resistor precursor composition having a viscosity of not greater than about 100 centipoise and comprising:
 - i) at least a first molecular precursor compound; and
 - ii) at least first particles selected from the group consisting of metal particles, metal oxide particles and carbon and carbon particles;
- (c) heating said resistor precursor composition to a temperature of not greater than about 350°C to convert said resistor precursor composition to an inorganic resistor.

The References

Kydd	6,379,745 B1	Apr. 30, 2002
Schaper	2002/0131254 A1	Sep. 19, 2002
Holl	2002/0148640 A1	Oct. 17, 2002 (filed Apr. 11, 2002)
Yadav	2002/0176987 A1	Nov. 28, 2002 (filed May 17, 2002)
Speakman	6,503,831 B2	Jan. 7, 2003 (filed Feb. 6, 2002)
Renn	2003/0020768 A1	Jan. 30, 2003 (filed Jan. 30, 2002)
Leenders	EP 0 696 515 A1	Feb. 14, 1996

The Rejections

The claims stand rejected under 35 U.S.C. § 103 as follows:

claims 17-25, 27, 33-35, 37-39, 41-44, 46, 47, 50, 51, 53 and 54 over Kydd in view of Speakman and Holl;¹ claim 26 over Kydd in view of Speakman, Holl and Renn; claims 28-31 over Kydd in view of Speakman, Holl and

¹ The Examiner's statement of the rejections does not include claim 35 (Ans. 3-8). The Appellants state that claim 35 is subject to appeal (Br. 3, 5), and the palladium recited in claim 35 is disclosed by Kydd (col. 8, l. 29). We therefore consider the Examiner's omission of claim 35 from the statement of the rejections to be inadvertent.

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Popat; claim 32 over Kydd in view of Speakman, Holl and Leenders; claims 36, 48 and 49 over Kydd in view of Speakman, Holl and Schaper; and claims 40, 45 and 52 over Kydd in view of Speakman, Holl and Yadav.

ISSUE

The issue is whether the Appellants have shown reversible error in the Examiner's rejection of the Appellants' claims.

PRINCIPLES OF LAW (PL)

Obviousness

1. For a *prima facie* case of obviousness to be established there must be "an apparent reason to combine the known elements in the fashion claimed." *KSR Int'l. Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-41 (2007).
2. In making an obviousness determination one "can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR*, 127 S. Ct. at 1741.
3. "A person of ordinary skill is also a person of ordinary creativity, not an automaton." *KSR* 127 S. Ct. at 1742.
4. "[T]he problem motivating the patentee may be only one of many addressed by the patent's subject matter. The question is not whether the combination was obvious to the patentee but whether the combination was obvious to a person with ordinary skill in the art." *KSR*, 127 S. Ct. at 1742.
5. "[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill." *KSR*, 127 S. Ct. at 1740.

6. “[T]he [obviousness determination] 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.” *KSR*, 127 S. Ct. at 1741.
7. “When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.” *KSR*, 127 S. Ct. at 1742 (2007).
8. “Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 127 S. Ct. at 1740-41.
9. The Examiner has the initial burden of establishing a prima facie case of obviousness. *See In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984); *In re Rinehart*, 531 F.2d 1048, 1051 (CCPA 1976).
10. When a prima facie case of obviousness has been established, the Appellants have the burden of rebutting it by presenting objective evidence of non-obviousness. *See Piasecki*, 745 F.2d at 1472; *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). A final determination regarding obviousness is then reached by starting anew and evaluating

the rebuttal evidence along with the evidence upon which the conclusion of prima facie obviousness was based. *See Rinehart*, 531 F.2d at 1052.

11. The motivation relied upon by the Examiner must not come solely from the description of the Appellants' invention in their specification. If it does, the Examiner used impermissible hindsight when rejecting the claims. *See W.L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 1553, (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984); *In re Rothermel*, 276 F.2d 393, 396 (CCPA 1960).

FINDINGS OF FACT

1. Kydd discloses a composition for forming electrical conductors on temperature sensitive substrates at temperatures below 450°C (abstract; col. 1, ll. 12-16).
2. Kydd's composition comprises a metal powder mixture and a reactive organic medium capable of decomposing at a relatively low temperature, the disclosed temperatures being as low as 150°C (col. 8, ll. 9-11; col. 10, ll. 40-49).
3. Kydd's composition can be applied to a substrate using an ink jet printer (col. 10, ll. 63-65).²
4. Speakman discloses a method of forming two- or three-dimensional structures such as electronic circuit elements using drop on demand printing wherein ink is ejected from an ink-jet printhead (col. 1, ll. 9-17, 45-46).
5. Speakman's circuit elements can be formed from organic, inorganic or hybrid inorganic-organic material (col. 3, ll. 6-14);

² Ink jet devices are among the Appellants' direct-write tools (claim 25).

col. 12, ll. 22-24), and can be an electrical resistor formed from polymeric material (col. 14, l. 62 – col. 15, l. 13).

6. The portion of Holl relied upon by the Examiner (Ans. 4) discloses that prior art resistor inks typically comprise a mixture of ruthenium dioxide or pyrochlor together with glass powder in a suitable suspension, and that a resistor is produced by heating the ink such that the suspension component is removed and the glass powder forms an adhesive matrix (¶ 0047).

ANALYSIS

Rejection of claims 17-25, 27, 33-35, 37-39, 41-44, 46, 47, 50, 51, 53 and 54 over Kydd in view of Speakman and Holl

We need to address only the sole independent claim, i.e., claim 17. That claim requires a method for making an inorganic resistor.

The Examiner argues that Kydd “discloses that dielectric and resistor patterns can be formed as well (col. 3, lines 35-50)” (Ans. 3).

That portion of Kydd pertains to an article by Teng³ wherein, Kydd states, “[t]he authors described their work on printing silver and gold conductors as well as dielectrics and resistors” (col. 3, ll. 46-47). That portion of Kydd pertains to what is disclosed by Teng, not what can be made using Kydd’s method.

The Examiner argues that one of ordinary skill in the art would have modified Kydd’s process to form a resistor using Speakman’s compositions with the expectation of achieving the desired end product, and that such a

³ K.F. Teng and Robert W. Vest, “Liquid Ink Jet Printing with MOD Inks for Hybrid Microcircuits”, CHMT-12 *IEEE Trans. on Components, Hybrids and Mfg. Tech.* 545-59 (Dec. 1987).

person would have modified Speakman's compositions to include Holl's ruthenium dioxide and glass powder with the expectation of achieving similar results (Ans. 4).⁴

The Examiner's reasoning does not establish that the applied prior art would have provided one of ordinary skill in the art with an apparent reason to combine the known elements in the fashion claimed (PL 1). The Examiner's argument that in combining Kydd and Speakman one of ordinary skill in the art would have had an "expectation of achieving the desired end product" does not specify what the desired end product is to which those references would have led one of ordinary skill in the art, or why the applied prior art would have led one of ordinary skill in the art to that product. Consequently, in the Examiner's argument that one of ordinary skill in the art would have combined Speakman and Holl to obtain similar results, it is not apparent what the results are to which the combination would be similar. Also, it is not apparent why one of ordinary skill in the art would have combined Speakman and Holl to obtain those results. Thus, the record indicates that the reason relied upon by the Examiner for combining the references to arrive at the Appellants' claimed invention comes from the Appellants' disclosure rather than coming from the applied prior art and that, therefore, the Examiner used impermissible hindsight in rejecting the Appellants' claims (PL 11).

The Examiner argues that although the resistor disclosed by Speakman is made of polymeric material (col. 14, l. 62 – col. 15, l. 13),

⁴ Ruthenium dioxide and pyrochlor are among the materials which can be used to form the conductive phase of the Appellants' inorganic resistor (Spec. 52:12-19).

Speakman discloses that the circuit element can be organic, inorganic or a hybrid of the two (col. 12, ll. 22-24) (Ans. 8-9). Thus, the Examiner argues, “one skilled in the art at the time the invention was made would have had a reasonable expectation of achieving similar success regardless of the compositional make-up of the circuit element” (Ans. 9).

The Examiner’s argument is not well taken because the Examiner has not established that Speakman’s disclosure that the circuit elements produced by the disclosed method can be organic, inorganic or a hybrid of the two would have led one of ordinary skill in the art to expect similar success using organic and inorganic resistors.

The Examiner argues, in reliance upon pages 52-53 of the Appellants’ Specification, that Holl’s resistor composition is similar to that of the Appellants (Ans. 10).

Those pages of the Specification disclose that the conductive phase of the Appellants’ inorganic resistor can include ruthenium dioxide and pyrochlor, which are two of the disclosed components of Holl’s resistor ink (¶ 0047). Holl also discloses that when the composition is heated the glass powder forms an adhesive matrix (¶ 0047). The Examiner has not established that such a composition can be converted to a resistor at a temperature no greater than about 350°C as required by the Appellants’ claim 17. The Appellants argue that Holl’s resistor composition is a high temperature composition (Br. 13), and the Examiner has provided no evidence to the contrary. Moreover, the Examiner has not established that the applied prior art would have led one of ordinary skill in the art to use Holl’s resistor components to make Kydd’s circuit element a resistor instead of Kydd’s electrical conductor (col. 24, ll. 61-64).

For the above reasons we conclude that the Examiner has not established a prima facie case of obviousness of the inventions claimed in the Appellants' claim 17 or its dependent claims 18-25, 27, 33-35, 37-39, 41-44, 46, 47, 50, 51, 53 and 54.

Rejections of claim 26 over Kydd in view of Speakman, Holl and Renn, claims 28-31 over Kydd in view of Speakman, Holl and Popat, claim 32 over Kydd in view of Speakman, Holl and Leenders, claims 36, 48 and 49 over Kydd in view of Speakman, Holl and Schaper, and claims 40, 45 and 52 over Kydd in view of Speakman, Holl and Yadav.

The Examiner does not rely upon Renn, Popat, Leenders, Schaper or Yadav for any disclosure that remedies the above-discussed deficiency in Kydd, Speakman and Holl as to claim 17 from which claims 26, 28-32, 36, 40, 45, 48, 49 and 52 directly or indirectly depend (Ans. 5-8).

The Examiner, therefore, has not established a prima facie case of obviousness of the inventions claimed in the Appellants' claims 26, 28-32, 36, 40, 45, 48, 49 and 52.

CONCLUSIONS OF LAW

The rejections under 35 U.S.C. § 103 of claims 17-25, 27, 33-35, 37-39, 41-44, 46, 47, 50, 51, 53 and 54 over Kydd in view of Speakman and Holl, claim 26 over Kydd in view of Speakman, Holl and Renn, claims 28-31 over Kydd in view of Speakman, Holl and Popat, claim 32 over Kydd in view of Speakman, Holl and Leenders, claims 36, 48 and 49 over Kydd in view of Speakman, Holl and Schaper, and claims 40, 45 and 52 over Kydd in view of Speakman, Holl and Yadav are reversed.

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DECISION/ORDER

It is ordered that the Examiner's decision is reversed.

REVERSED

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