



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
**United States Patent and Trademark Office**  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/155,845	05/16/2016	Radislav Alexandrovich Potyrailo	281861-2	5706
6147	7590	12/18/2019	EXAMINER	
GENERAL ELECTRIC COMPANY			ZAKARIA, AKM	
GLOBAL RESEARCH			ART UNIT	
1 RESEARCH CIRCLE			PAPER NUMBER	
K1 - 3A59			2868	
Niskayuna, NY 12309			NOTIFICATION DATE	
			DELIVERY MODE	
			12/18/2019	
			ELECTRONIC	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

GRCLegal.mail@ge.com  
preisman@ge.com

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

*Ex* RADISLAV ALEXANDROVICH POTYRAILO,  
WAJDI MOHAMMAD AHMAD, NASR ALKADI, and  
JOHN ANDREW WESTERHEIDE

---

Appeal 2019-001035  
Application 15/155,845  
Technology Center 2800

---

Before KAREN M. HASTINGS, N. WHITNEY WILSON, and  
CHRISTOPHER C. KENNEDY, *Administrative Patent Judges*.

HASTINGS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant<sup>1</sup> requests our review under 35 U.S.C. § 134(a) of the Examiner's decision rejecting claims 1–25 under 35 U.S.C. § 103 as unpatentable over at least the combined prior art of Chen (US 2015/0346197 A1; published Dec. 3, 2015) and Boersma (US 2014/0106468 A1; published Apr. 17, 2014).<sup>2</sup>

---

<sup>1</sup> We use the word “Appellant” to refer to the “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies General Electric Company as the real party in interest (Appeal Br. 3).

<sup>2</sup> The additional references applied to various dependent claims are Haick (US 2011/0098591 A1; published Apr. 28, 2011 ) to claims 3-5 and 7; Na

We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We AFFIRM.

#### CLAIMED SUBJECT MATTER

Claim 1 is illustrative of the subject matter on appeal (emphasis added to highlight one key disputed limitation):

1. A sensor for selective detection of methane comprising:  
a multivariable inductor-capacitor-resistor resonant transducer having a plurality of operationally independent outputs;  
a sensing material composition comprising a methane-sensing moiety; and  
*a matrix material incorporating the methane-sensing moiety,*  
wherein the methane-sensing moiety is incorporated into the matrix material by dispersing or dissolving the methane-sensing moiety in the matrix material; and wherein the matrix material directs interference response out of response direction to methane.

Appellant's arguments mainly focus on limitations common to independent claims 1, 13, and 20 (*see generally* Briefs). To the extent Appellant presents separate remarks for rejections of the dependent claims, these will be addressed below.

#### OPINION

Upon consideration of the evidence of record and each of Appellant's contentions as set forth in the Appeal Brief, as well as the Reply Brief, we determine that Appellant has not demonstrated reversible error in the Examiner's rejections (e.g., *see generally* Ans.). *In re Jung*, 637 F.3d 1356,

---

(US 2003/0001153 A1; published Jan. 3, 2013) to claims 6 and 14; Bonne (US 6,792,794 B2; issued Sep. 21, 2004) to claims 10, 16, 17, 22, and 23; and Giurgiutiu (US 2013/0129275 A1; published May 23, 2013) applied to claims 11, 12, 18, 19, 24, and 25 (e.g., Ans. 3).

1365–66 (Fed. Cir. 2011) (explaining the Board’s long-held practice of requiring Appellant(s) to identify the alleged error in the Examiner’s rejection). We sustain the rejections generally for the reasons expressed by the Examiner in the Final Office Action and the Answer.

We add the following primarily for emphasis.

It has been established that the predictable use of known prior art elements performing the same functions they have been known to perform is normally obvious, and the combination of familiar elements is likely to be obvious when it does no more than yield predictable results. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007); *see also KSR*, 550 U.S. at 418 (“the [obviousness] 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.”). *See also In re Fritch*, 972 F.2d 1260, 1264–65 (Fed. Cir. 1992) (a reference stands for all of the specific teachings thereof as well as the inferences one of ordinary skill in the art would have reasonably been expected to draw therefrom).

Appellant’s main contentions focus on a lack of a reason to use the claimed matrix material incorporating the methane sensing moiety as found in Boersma in the electronic sensor of Chen because Boersma is directed to an optical sensor (Appeal Br. 9–12; Reply Br. 2–5). Appellant also argues that there is no reasonable expectation of success or motivation to combine the teachings of the references (Appeal Br. 13, 14; Reply Br. 5). Appellant also states that the applied references do not teach that the claimed matrix material “directs interference response out of response direction to methane”

(Appeal Br. 15). Appellant’s arguments are not persuasive of reversible error for reasons presented by the Examiner (Ans. 6–11).

As pointed out by the Examiner, the claims do not exclude the use of an optical sensor (*id.*). Indeed, Boersma states that electronics may be used in the detection and/or data processing in combination with optical sensors (Boersma ¶ 3). In addition, Appellant does not direct us to any limiting definitions in the Specification pertaining to the specific use of the recited transducer in relationship to the analyte-sensing moiety incorporated into a matrix material. Claims 1, 13 and 20 do not set forth how the disputed relevant methane-sensing moiety and matrix material interact with the recited transducer.

In any event, in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 419–20 (2007), the Supreme Court stated that:

In determining whether the subject matter of a . . . claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim. If the claim extends to what is obvious, it is . . . [unpatentable] under § 103. 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 [the] invention a known problem for which there was an obvious solution encompassed by the patent’s claims.

“The Supreme Court’s decision in *KSR* . . . directs us to construe the scope of analogous art broadly, stating that ‘*familiar items may have obvious uses beyond their primary purposes*, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle.’” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238 (Fed. Cir. 2010) (quoting *KSR*, 550 U.S. at 420).

It is well established that prior art references must be considered in its entirety, i.e., as a whole, when determining obviousness. One of ordinary skill in the art would have inferred and readily appreciated that a known material for capturing methane, such as analyte-sensitive polymer dispersed in a matrix material discussed in Boersma (Boersma, e.g., ¶¶ 69, 70, 74, 79), may be used to capture methane to be detected by Chen's electronic sensor which uses chemi-absorbent polymers to react with methane or other materials to be detected (Chen, e.g., ¶¶ 67-73).

Likewise, Appellant's arguments regarding the lack of motivation to combine the cited art are also unpersuasive for the reasons given above. That is, the arguments fail to account for "the inferences and creative steps that a person of ordinary skill in the art would employ." *See KSR*, 550 U.S. at 418. *Cf., In re Beattie*, 974 F.2d 1309, 1312 (Fed. Cir. 1992) ("[T]he law does not require that the references be combined for the reasons contemplated by the inventors."); *see also In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

Finally, choosing to define an element functionally, i.e., by what it does, carries with it a risk. Where there is reason to conclude that the structure of the prior art is inherently capable of performing the claimed function, the burden shifts to the applicant to show that the claimed function patentably distinguishes the claimed structure from the prior art structure. *See In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997); *In re Hallman*, 655 F.2d 212, 215 (CCPA 1981). The Examiner reasonably determined that Boersma's structure of an analyte-sensitive polymer in a nano-structured matrix material would appear to be inherently capable of the recited function of "directs interference response out of response direction to methane"

(claim 1). Appellant has not shown otherwise with sufficient technical reasoning or credible evidence, merely stating the references “are silent” as to this function (Appeal Br. 15).

It has been established that obviousness does not require absolute predictability of success; all that is required is a reasonable expectation of success. *In re Kubin*, 561 F.3d 1351, 1360 (Fed. Cir. 2009). Furthermore, inasmuch as the sensing material/matrix material as recited was known in the art as suitable for detecting an analyte, it is incumbent upon Appellant to establish that the present inventors had to resort to more than routine experimentation to determine if it would have been effective in a device of the type disclosed by Chen. However, no such evidence is of record.

Thus, Appellant has not shown reversible error in the Examiner’s position that it would have been obvious for one of ordinary skill to have used a known analyte-sensitive polymer matrix as exemplified in Boersma for the analyte-sensitive chemi-absorbent polymer of Chen. *See KSR*, 550 U.S. at 417 (the predictable use of known prior art elements or steps performing the same functions they have been known to perform is normally obvious; the combination of familiar elements/steps is likely to be obvious when it does no more than yield predictable results); *see also In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references.”) and *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983) (“[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review.”).

Accordingly, we sustain the Examiner’s rejection of independent claims 1, 13, and 20, as well as all claims dependent that are not separately argued thereon (Appeal Br. 15).

Appellant provides separate sections in the Appeal Brief addressing the separate rejections of various dependent claims (Appeal Br. 15-19). The remarks therein do not appear to provide further substantive arguments, rather, for the most part they allege the additional references fail to cure the deficiencies previously discussed. For this reason as well as the reasons set out by the Examiner (Ans. 11-19), these remarks do not identify reversible error in these rejections.

### CONCLUSION

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 2, 8, 9, 13, 15, 20, 21	103	Chen, Boersma	1, 2, 8, 9, 13, 15, 20, 21	
3-5, 7	103	Chen, Boersma, Haick	3-5, 7	
6, 14	103	Chen, Boersma, Na	6, 14	
10, 16, 17, 22, 23	103	Chen, Boersma, Bonne	10, 16, 17, 22, 23	
11, 12, 18, 19, 24, 25	103	Chen, Boersma, Giurgiutiu	11, 12, 18, 19, 24, 25	
<b>Overall Outcome</b>			1-25	

Appeal 2019-001035  
Application 15/155,845

TIME PERIOD FOR RESPONSE

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