780 F.3d 1376
United States Court of Appeals,
Federal Circuit.

KENNAMETAL, INC., Appellant
v.
INGERSOLL CUTTING TOOL COMPANY, Appellee.

No. 2014–1350. | March 25, 2015.

Synopsis

Background: Competitor petitioned for inter partes reexamination of patent related to cutting tools containing ruthenium as a binder that are coated using physical vapor deposition (PVD). The United States Patent and Trademark Office, Patent Trial and Appeal Board, 2013 WL 6039030, entered finding that patent claims were invalid as obvious and anticipated. Patent assignee appealed.

Holdings: The Court of Appeals, Linn, Circuit Judge, held that:

[1] substantial evidence supported anticipation determination, and

[2] substantial evidence supported obviousness determination.

Affirmed.

West Headnotes (15)

[1] Patents
Questions of law or fact

Patents
Questions of law or fact

Anticipation is a question of fact, while obviousness is a question of law based on underlying findings of fact. 35 U.S.C.A. §§ 102, 103.

Cases that cite this headnote

[2] Patents
Scope of Review

Court of Appeals reviews the factual findings of the Patent Trial and Appeal Board for substantial evidence and its legal conclusions without deference.

Cases that cite this headnote

[3] Patents
Scope of Review

For purposes of review of factual findings of Patent Trial and Appeal Board, substantial evidence is such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.

Cases that cite this headnote

[4] Patents
Single reference disclosing every element or limitation of claim

A prior art reference can only anticipate a claim if it discloses all the claimed limitations arranged or combined in the same way as in the claim. 35 U.S.C.A. § 102(b) (2006).

1 Cases that cite this headnote

[5] Patents
Enablement

A reference can anticipate a claim even if it does not expressly spell out all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would at once envisage the claimed arrangement or combination. 35 U.S.C.A. § 102(b) (2006).

1 Cases that cite this headnote

[6] Patents
Particular products or processes

Substantial evidence supported determination of Patent Trial and Appeal Board in reexamination proceeding that pending claim of patent related to cutting tools containing ruthenium as a binder that are coated using physical

vapor deposition (PVD) was anticipated; with exception of combining ruthenium binders with PVD coatings, claim in prior art expressly recited all the elements of pending patent claim, and prior art claim recited using a binder consisting of one of five metals, one of which was ruthenium, together with a coating, and only disclosed three coating methods, one of which was PVD, and person of skill in the art, reading prior art claim, could envisage applying a PVD coating. 35 U.S.C.A. § 102(b) (2006).

1 Cases that cite this headnote

[7] Federal Courts

Failure to mention or inadequacy of treatment of error in appellate briefs

Arguments raised only in footnotes of appeal brief are waived.

Cases that cite this headnote

[8] Patents

New grounds for rejection

Patent assignee did not waive challenge to determination of Patent and Trial Appeal Board in reexamination proceeding that remaining claims in patent related to cutting tools containing ruthenium as a binder that are coated using physical vapor deposition (PVD) were obvious, although assignee failed to argue at Board for independent patentability of remaining claims, since at time of its briefing, all claims were rejected for obviousness, and only when Board instituted new basis for rejection, rejecting some claims for anticipation, and correspondingly regrouping claims, was there any reason assignee should have separately argued for patentability of the remaining claims. 35 U.S.C.A. § 103(a) (2006).

Cases that cite this headnote

[9] Federal Courts

Waiver of Error in Appellate Court

Arguments cannot be deemed waived if they were not previously required to have been made.

Cases that cite this headnote

[10] Patents

In general; multiple factors

Patents

Questions of law or fact

Obviousness is a question of law, based on underlying factual determinations, including: the scope and content of the prior art, differences between the prior art and the claims at issue, the level of ordinary skill in the pertinent art, and such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc. 35 U.S.C.A. § 103(a) (2006).

Cases that cite this headnote

[11] Patents

Presumptions and burden of proof

The Patent and Trademark Office bears the initial burden of showing a prima facie case of obviousness; when a prima facie case of obviousness is made, the burden then shifts to the applicant to come forward with evidence and/or argument supporting patentability. 35 U.S.C.A. § 103(a) (2006).

Cases that cite this headnote

[12] Patents

Particular products or processes

Substantial evidence supported finding of Patent Trial and Appeal Board in reexamination proceeding that claim in patent related to cutting tools containing ruthenium as a binder that are coated using physical vapor deposition (PVD) was obvious based on prior art; person of skill in the art reading prior art would readily envisage combination of ruthenium binders and PVD coatings, and it would have been obvious to that person that these two could be combined with reasonable expectation of success, and express teaching was not significantly undermined by the problem of cobalt capping. 35 U.S.C.A. § 103(a) (2006).

Cases that cite this headnote

[13] Patents
In general; utility

US Patent 6,214,247. Cited as Prior Art.

Cases that cite this headnote

[14] Patents
In general; utility

US Patent 6,554,548. Cited.

Cases that cite this headnote

[15] Patents
In general; utility

US Patent 7,244,519. Invalid.

Cases that cite this headnote

Attorneys and Law Firms

***1378** Steven Moore, Kilpatrick Townsend & Stockton LLP, San Francisco, CA, argued for appellant. Also represented by J. Jason Link, N. Dean Powell, Winston–Salem, NC.

Nanda Alapati, Womble, Carlyle, Sandridge & Rice, PLLC, Tysons Corner, VA, argued for appellee. Also represented by David Ryan Crowe, Greensboro, NC; Ian A. Calvert, Winston–Salem, NC.

Before PROST, Chief Judge, NEWMAN, and LINN, Circuit Judges.

Opinion

LINN, Circuit Judge.

Kennametal, Inc. ("Kennametal") appeals the decision of the Patent Trial and Appeal Board (the "Board") in an *inter partes* reexamination of U.S. Patent No. 7,244,519 (the "#519 patent") in which the Board: (a) entered a new anticipation ground of rejection asserted by Ingersoll Cutting Tool Co. ("Ingersoll") against certain of the pending claims; and (b) affirmed the Examiner's obviousness rejection of certain remaining claims. *See Ingersoll Cutting Tool Co. v. TDY Indus.*, Reexamination Ctrl. No. 95/001,417, *available at* 2013 WL 6039030 (P.T.A.B. Nov. 12, 2013) ("Board Decision on Rehearing"); *Ingersoll*, *available at* 2013 WL 3294868 (P.T.A.B. May 6, 2013) ("Initial Board Decision"). Because substantial evidence supports the Board's determinations of anticipation and obviousness and because we see no error in the Board's legal conclusion of obviousness, we affirm.

I. BACKGROUND

A. The '519 Patent

The '519 patent was filed in 2004 and issued in 2007. The '519 patent relates to cutting tools containing ruthenium as a binder that are coated using physical vapor deposition ("PVD"). *See, e.g.*, '519 patent Title; *id.* Abstract. The patent explains that cemented carbide cutting tools are generally useful. *Id.* col. 1 ll. 15–19. These tools are made by consolidating hard particles and a binder to form a compact, which is then sintered to form a tool blank from which a variety of tools can be formed. *Id.* col. 1 ll. 19–26. Cobalt is often used in the binder. *Id.* col. 1 ll. 48–50.

According to the '519 patent, it was unusual to include ruthenium with cobalt in the binder, and, in those instances when a cobalt-ruthenium binder was used, no one had coated the tools using PVD. *Id.* col. 1 ll. 54–56, col. 2 ll. 58–61. The patent suggests that the reason cobalt-ruthenium binders were not coated by PVD was because ***1379** the use of cobalt in a binder tends to create cobalt structures on the surface —a process known as "cobalt capping." *Id.* col. 3 ll. 6–10; *id.* col. 3 ll. 38–40. This problem is supposedly exacerbated when ruthenium is included in the binder. *Id.* col. 3 ll. 13–15. According to the patent, PVD coating—which is done at a lower temperature than other methods of coating, such as chemical vapor deposition—is not hot enough to re-melt the surface of the binder, so coatings applied via PVD do not adhere well to binders that produce cobalt capping. *Id.* col. 3 ll. 33–36. Additionally, PVD coatings, as the patent describes, can be too thin to compensate for the cobalt capping effect. *Id.* col. 3 ll. 36–37.

The inventors assigned their interests in the invention claimed in the '519 patent to TDY Industries, Inc. ("TDY") at the time the application for the patent was filed. '519 patent Assignee. In 2010, TDY sued Ingersoll for infringement of the '519 patent. *TDY Indus. Inc. v. Ingersoll Cutting Tool Co.*, No.

2:10–cv–00790–CB (W.D.Pa., filed June 10, 2010). After the suit was filed, TDY assigned the ′519 patent to Kennametal. Ingersoll successfully petitioned the Patent and Trademark Office (the "Patent Office") for *inter partes* reexamination of the ′519 patent, and the district court, in turn, stayed the litigation.

B. Proceedings at the Patent Office

Ingersoll submitted a request for *inter partes* reexamination, claiming that some of the original claims were anticipated under 35 U.S.C. § 102(b) and all of the claims were obvious under § 103(a). The Examiner did not adopt any of Ingersoll's proposed anticipation rejections but did reject all of the pending claims as obvious. In response, the patentee amended the existing claims and filed numerous new claims. Pending claim 1 is representative, and recites as amended:

1. A cutting tool, comprising:

a cemented carbide substrate, wherein the substrate comprises hard particles and a binder, and the binder comprises ruthenium; and

at least one physical vapor deposition coating on at least a portion of the substrate.

Ingersoll again proposed both anticipation and obviousness rejections. The Examiner refused to adopt the anticipation rejections but did reject all of the claims as obvious. Kennametal appealed the rejections, and Ingersoll cross-appealed the Examiner's refusal to adopt its proposed anticipation rejections.

In the Initial Board Decision, the Board found that the Examiner erred in not adopting Ingersoll's proposed rejection of pending claims 1–4, 9–18, 23, 24, 27–31, 35, 36, 45, 46, 49, 50, 58, 83, 85 and 89 as anticipated by U.S. Patent No. 6,554,548 to Grab ("Grab"). Initial Board Decision, at *3–5.

The Board found that claim 5 of Grab expressly described the majority of the elements recited in pending claim 1 of the ′519 patent. *Id.* at *3–5. Claim 5 of Grab and its parent, claim 1, recite:

1. A coated cutting insert comprising:

a rake face and a flank face, a cutting edge at the juncture of the rake face and the flank face;

the cutting insert having a hard refractory coating and a substrate wherein the coating is adherently bonded to the substrate;

the substrate comprising a tungsten carbide-based material comprising a bulk composition of at least about 70 weight percent tungsten and carbon, between about 3 weight percent and ***1380** about 12 weight percent cobalt, and at least 0.09 weight percent chromium;

the cobalt and the chromium forming a binder alloy:

wherein the binder alloy content being enriched in a surface zone of binder alloy enrichment beginning near and extending inwardly from a peripheral surface of the substrate; and

wherein the bulk composition of the substrate further comprises tantalum in an amount up to about 10 weight percent, niobium in an amount up to about 6 weight percent, and titanium in an amount up to about 10 weight percent.

5. The coated cutting insert of claim 1 wherein the binder alloy further includes one or more of tungsten, iron, nickel, ruthenium, and rhenium.

The Board noted that claim 5 of Grab specifically recites five metals, one of which was ruthenium. Initial Board Decision, at *4. Claim 5 also recites a "coating," but, the Board acknowledged, does not state that the coating is applied via PVD. *Id.* The Board noted, however, that the specification of Grab discloses PVD as one of three contemplated methods of coating. *Id.* Specifically, Grab states:

Generally speaking, one or more of the coating layers of the coating schemes are applied by chemical vapor deposition (CVD) and moderate temperature chemical vapor deposition (MTCVD).

However, applicants also contemplate that one or more layers of a coating scheme may be applied by physical vapor deposition (PVD).

Grab col. 4 ll. 56–61. The Board also found that claim 5's recitation of a "coating" was "a specific hook back into the Grab disclosure for the further description of how that coating is applied." Initial Board Decision, at *5. The Board found that the description of coating by PVD was not negated by the fact that CVD and MTCVD were "characterized by Grab as preferred." *Id.* at *4. The combination of one of five metals

with one of three coatings leads to only fifteen possibilities, which, according to the Board, was a sufficiently definite and limited class so that each member of the class was anticipated by Grab. *Id.* at *4–5. The Board stated that Ingersoll provided evidence that claims 2–4, 9–18, 23, 24, 27–31, 35, 36, 45, 46, 49, 50, 58, 83, 85 and 89 were also anticipated, and neither the Examiner nor the Patent Owner distinguished these claims from claim 1. Therefore, the Board ruled that these claims were also anticipated by Grab. *Id.* at *5.

Because the Board found these claims anticipated, it refused to consider whether these claims were also obvious. *Id.* at *7. The Board separately found claims "5–8, 19–22, 23, 24, 25, 26, 56, 57, 59, 86, and 90" [1] obvious over Grab in view of additionally cited prior art. *Id.*

Regarding obviousness, the Board affirmed the Examiner's rejections of: claims 33, 34, 37–44, 47, 48 and 84 as obvious over U.S. Patent No. 6,214,247 to Leverenz ("Leverenz"); claims 24, 25, 26, 49–52, 56, 57, 59, 86–90 and 93 as obvious over Leverenz in view of other prior art; and claims 2–14, 16–23, 27, 31, 33–48, 58, 84 and 85, "[w]ith respect to the dependent claims not already addressed," [2] as obvious ***1381** over Leverenz in view of T.L. Shing, et al., *The effect of ruthenium additions on the hardness, toughness and grain size of WC–Co*, 19 Int'l J. Refractory Metals & Hard Materials 41 (2001). The Board rejected Kennametal's assertion that these claims provided unexpected results because it found that the unexpected results lacked a nexus to the limitations recited in the claims. *Id.* at *7–8.

The Board denied Kennametal's request for a rehearing, finding that although Grab appeared not to have applied coatings by PVD, it still anticipated this usage. Board Decision on Rehearing, at *3. It also found that Grab's teachings, especially in view of the art at the time, would have avoided a cobalt capping problem and were therefore enabling. *Id.* at *4.

II. DISCUSSION

Kennametal appeals all the Board's rejections. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(4).

A. Standard of Review

[1] **[2]** **[3]** Anticipation under 35 U.S.C. § 102 is a question of fact, while obviousness under § 103 is a question of law based on underlying findings of fact. *Flo Healthcare Solutions, LLC v. Kappos*, 697 F.3d 1367, 1375 (Fed.Cir.2012) (citing cases). We review the Board's factual findings for substantial evidence and its legal conclusions without deference. *Id.* at 1375–76 (citing cases). "Substantial evidence is 'such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.' " *In re Applied Materials, Inc.*, 692 F.3d 1289, 1294 (Fed.Cir.2012) (quoting *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229, 59 S.Ct. 206, 83 L.Ed. 126 (1938)).

B. Anticipation

[4] **[5]** A patent is invalid if "the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States." 35 U.S.C. § 102(b) (2006). [3] A prior art reference can only anticipate a claim if it discloses all the claimed limitations "arranged or combined in the same way as in the claim." *Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1361 (Fed.Cir.2012) (quoting *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed.Cir.2008)). However, a reference can anticipate a claim even if it "d[oes] not expressly spell out" all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would "at once envisage" the claimed arrangement or combination. *In re Petering*, 49 CCPA 993, 301 F.2d 676, 681 (1962).

[6] Kennametal argues that Grab does not disclose the combination of ruthenium as a binder and a PVD coating. It notes that Grab discloses five potential metals to use in the binder, which, allowing for combinations of metals (*e.g.*, the combination of tungsten and ruthenium), allows for 31 different possibilities—although it recognizes that 16 of these include ruthenium. Op. Br. at 38. Kennametal also notes that the examples in Grab include three to five coating layers. Kennametal asserts that allowing for three options for each coating creates a total of 351 possible coating solutions, which, when multiplied by the 31 ***1382** different binder possibilities, allows for 10,881 possibilities. Op. Br. at 40. Kennametal further maintains that, in fact, claim 5 of Grab allows an infinite number of options since, for instance, the percentages of the various binders and the thickness of the coating are undefined. Kennametal claims that the number of

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