

NOTE: This disposition is nonprecedential.

**United States Court of Appeals  
for the Federal Circuit**

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**IN RE: YOUQING ZHANG,**  
*Appellant*

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2015-1995

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Appeal from the United States Patent and Trademark  
Office, Patent Trial and Appeal Board in No. 12/023,047.

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Decided: June 17, 2016

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GEORGE G. WANG, Bei & Ocean, Millington, NJ for  
appellant.

THOMAS W. KRAUSE, Office of the Solicitor, United  
States Patent and Trademark Office, Alexandria, VA, for  
appellee Michelle K. Lee. Also represented by STACY  
BETH MARGOLIES, JOSEPH MATAL, WILLIAM LAMARCA.

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Before LOURIE, DYK, and STOLL, *Circuit Judges*.

PER CURIAM.

Mr. Zhang appeals a decision of the Patent Trial and  
Appeal Board in the examination of Patent Application  
Serial No. 12/023,047. The Board affirmed the examiner's  
rejection of claims 1–13 for failure to satisfy the written

description requirement of 35 U.S.C. § 112, paragraph 1, and for obviousness under 35 U.S.C. § 103(a). Because substantial evidence supports the Board's obviousness determination, we affirm the final rejection of claims 1–13 of the '047 application.

#### BACKGROUND

The purported invention relates to methods of preventing knitted fabrics from unraveling by creating bonds at the crossover points of the fabric's yarns. The application discloses a fabric made of at least two yarns, one with a lower melting point than the other, so that when heated and then cooled, a bond is created between the contacting yarn segments. The '047 application discloses that this bond-forming yarn melts between 150° and 220°C, and that the other yarn must have a higher melting point. The application further describes that the number of bonds at the crossover points will affect the physical properties and "hand feel" of the fabric. Too many bonds would result in fabric with a "hard hand feel," meaning a fabric that is rough or coarse to the touch. Too few bonds would result in fabric prone to unraveling. The '047 application purports to address the balance between the hand feel and anti-raveling effect with an ideal bond-forming rate. It discloses that "parameters should be chosen so as to produce the bonding at 5%–20% of the yarn crossover points" and identifies 10% as the preferred bonding rate. Joint Appendix ("J.A.") 257.

Claim 1 is representative of the claims on appeal<sup>1</sup> and recites:

1. A knitted fabric, comprising a first yarn and a second yarn forming a plurality of stitches, wherein said first yarn is *non-coated* and has a melting

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<sup>1</sup> The parties and the Board treated claim 1 as representative, and therefore we do the same.

point lower than said second yarn; segments of said first yarn cross over each other in forming said stitches and result in a plurality of crossover points; and at a percentage of said crossover points there is a bond formed between said segments of said first yarn.

J.A. 189 (emphasis added). Claim 6 claims the knitted fabric of claim 1, “wherein said knitted fabric is a weft-knitted fabric,” *id.*, i.e., where the yarn zigzags along the length of the fabric following adjacent columns.

During prosecution, the pending claims were rejected as anticipated by U.S. Patent No. 4,748,078 (“Doi”) and for obviousness in view of the same reference. Doi describes a lace fabric made with “a heat bonding yarn comprising a lace knitting yarn carrying a low-melting thermoplastic synthetic resin covering and said heat bonding yarn being thermally joined to itself or to other component yarns at intersections.” Doi, ’078 patent, Abstract. Because Doi used coated yarn, Mr. Zhang attempted to amend his claims to add a limitation that the bond-forming yarn (or “first yarn”) is “non-coated” to traverse these rejections. The examiner rejected the added limitation for lack of written description because “‘non-coated’ was not set forth in the specification as originally filed.” J.A. 181. The Board agreed and affirmed the examiner’s rejection of claims 1–13 based on § 112, paragraph 1.

The Board also affirmed the examiner’s obviousness rejections of claims 1–5 and 7–13 over Doi and U.S. Patent No. 4,818,316 (“Weinle”) and claim 6 over Doi, Weinle, and U.S. Patent No. 2,811,029 (“Conner”). The examiner found that Doi “teaches the knitted fabric substantially as claimed,” but that “the melting yarn is coated rather than the claimed ‘non-coated’ yarn material.” J.A. 37. Weinle, however, “teaches that non-coated polyamide yarns are well known for use in knit fabrics as

a material for a meltable binding yarn.” *Id.* The Board affirmed the examiner’s “combination [that] involves substituting a non-coated yarn, as shown by Weinle, for the coated yarn of Doi . . . for disclosing that the heat bonding yarn crosses over itself for bonding, as claimed.” J.A. 11. The examiner further found, and the Board affirmed, that “Conner teaches weft knit fabrics which include melt yarns for fusion” and that it would have been obvious to a person of ordinary skill to make the knitted fabric of Doi as a weft knit because Conner discloses that weft knits having melt yarns were well known. 183–84.

Mr. Zhang appeals the rejections, and we have jurisdiction under 35 U.S.C. § 141(a) and 28 U.S.C. § 1295(a)(4)(A).

#### DISCUSSION

We review the Board’s factual findings for substantial evidence and its legal determinations de novo. *ACCO Brands Corp. v. Fellowes, Inc.*, 813 F.3d 1361, 1365 (Fed. Cir. 2016). “We review the Board’s ultimate obviousness determination de novo and underlying factual findings for substantial evidence.” *In re Varma*, 816 F.3d 1352, 1359 (Fed. Cir. 2016).<sup>2</sup>

Doi teaches lace fabric with a “foundation yarn which is wholly or partially comprised of a heat bonding fiber consisting in an ordinary lace yarn carrying a low-melting thermoplastic synthetic resin surface covering . . . .” Doi, ’078 patent col. 1 ll. 60–64. The Board determined that “Doi teaches using a coated yarn to solve the problem of

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<sup>2</sup> Given the January 31, 2008 effective filing date of the claims of the ’047 application, the version of 35 U.S.C. § 103 that applies here is that in force preceding the changes made by the America Invents Act. See Leahy–Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284, 293 (2011).

[a] hard hand [feel] . . .” J.A. 17. The Board also affirmed the examiner’s finding that “[i]t would have been obvious at the time the invention was made to substitute a ‘non-coated’ polyamide yarn material as shown by Weinle for the coated yarn of Doi et al in order to avoid the additional step of providing a coating on the yarn and yet still provide the same binding function.” J.A. 8 (quoting J.A. 73 (Examiner’s Answer)). Mr. Zhang primarily argues on appeal that Doi teaches away from using non-coated yarn because the “substitution of Doi’s coated yarn with Weinle’s non-coated yarn would eliminate the advantage provided by Doi’s coated yarn,” in that a soft hand feel may not be achieved. J.A. 18. The Board recognized this point, but nevertheless determined that “one skilled in the art would appreciate that Doi’s coated yarn is an alternative to the heat-bonding yarn of the prior art.” *Id.*

We conclude that the Board’s findings on obviousness, including that Doi does not teach away from using the non-coated yarn of Weinle, are supported by substantial evidence. While a prior art reference may indicate that a particular combination is undesirable for its own purposes, the reference can nevertheless teach that combination if it remains suitable for the claimed invention. *See In re Kahn*, 441 F.3d 977, 990 (Fed. Cir. 2006) (“[T]he teaching of [a reference] is not limited to the specific invention disclosed.”). Though using the non-coated yarn of Weinle to make the knitted fabric of Doi may eliminate the advantage in hand feel provided by Doi’s coated yarn, “[a] known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use.” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). Moreover, the claims of the ’047 application are not limited to fabrics that are soft to the touch. Rather, they only require a knitted fabric made of two yarns, one that is non-coated with a lower relative melting point that is heat-bonded to itself “at a

percentage of . . . crossover points.” J.A. 189. Substantial evidence supports the Board’s findings that the prior art teaches the claim elements and that a skilled artisan would have been motivated to combine the non-coated yarn of Weinle to make the heat-bonded fabric thermally bonded at the crossover points as disclosed in Doi. Mr. Zhang does not make additional arguments regarding the rejection of claim 6. We thus affirm the Board’s rejection of claims 1–13 for obviousness. Because we affirm the rejection of all pending claims under § 103(a), we decline to reach the rejection under § 112, paragraph 1. See *In re GPAC Inc.*, 57 F.3d 1573, 1577 (Fed. Cir. 1995).

#### CONCLUSION

Because the Board’s findings on obviousness are supported by substantial evidence, we affirm the final rejection of claims 1–13 in the ’047 application.

#### **AFFIRMED**

#### COSTS

No costs.