

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PUNGKUK WIRE MANUFACTURING COMPANY,
Petitioner,

v.

SEONG, KI CHUL,
Patent Owner.

Case IPR2016-00763
Patent 6,306,523 B1

Before JO-ANNE M. KOKOSKI, KRISTINA M. KALAN, and
CHRISTOPHER M. KAISER, *Administrative Patent Judges*.

KALAN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

INTRODUCTION

Pungkuk Wire Manufacturing Company (“Petitioner”) filed a Corrected Petition to institute an *inter partes* review of claims 1–18 of U.S. Patent No. 6,306,523 B1 (Ex. 1001, “the ’523 patent”). Paper 4 (“Pet.”). Seong, Ki Chul (“Patent Owner”) filed a Corrected Preliminary Response to the Petition. Paper 13 (“Prelim. Resp.”). On September 8, 2016, the Board instituted trial to review the patentability of claims 1–4, 6, 9–11, and 14–18 of the ’523 patent. Paper 14 (“Dec.”). Thereafter, Patent Owner filed a Response (Paper 37, “PO Resp.”), and Petitioner filed a Reply (Paper 40, “Reply”). Patent Owner filed a Motion to Exclude certain evidence submitted by Petitioner. Paper 63. Petitioner filed an opposition to the Motion to Exclude (Paper 65), and Patent Owner filed a reply to the opposition (Paper 66). An oral hearing was held June 7, 2017, and a transcript of the hearing is included in the record. Paper 69 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6, and we issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. We conclude that Petitioner has not established by a preponderance of the evidence that any of claims 1–4, 6, 9–11, and 14–18 of the ’523 patent are unpatentable. In addition, we dismiss Patent Owner’s motion to exclude evidence.

The ’523 Patent

The ’523 patent “relates to a porous electrode wire for use in electrical discharge machining and the method of manufacturing the same.” Ex. 1001, at [57]. The patent describes electrical discharge machining of a workpiece as “melting the workpiece during the arc discharge” created by applying “a

high frequency voltage” between an “electrode wire” and a “start hole” in the workpiece, along with “removing the machining particles using a machining liquid and an instantaneous vaporization power between the wire and the workpiece.” *Id.* at 1:20–33.

The invention of the ’523 patent is described as having the purposes of improving machining speed “by increasing the surface area of the wire which will be in contact with cooling liquid” and “by allowing the contact of the cooling liquid not only with the surface of the wire but also with inner part of the wire,” and providing a coated wire “with improved flushability without decreasing the machining accuracy.” *Id.* at 3:23–39. The patent describes achieving these purposes by “hot dip galvanizing” a wire made of a first metal by “passing the wire . . . through a molten [bath] of a second metal . . . thereby forming an alloy layer by the diffusion reaction between the first metal and the second metal . . . and a coating layer made of the second metal.” *Id.* at 3:40–49. The patent also describes drawing this wire to a new diameter, “thereby forming cracks in the alloy layer and the coating layer.” *Id.* at 3:51–53. The first metal “may use copper or brass having 63–67 wt % copper and 33–37 wt % zinc.” *Id.* at 3:54–55. The second metal “may use zinc, aluminum or tin.” *Id.* at 3:55–56.

Claim 1 of the ’523 patent is independent and is illustrative of the claimed subject matter. It is reproduced below.

1. A method of manufacturing a coated electrode wire for use in electrical discharge machining comprising:
 - providing an intermediate wire having a first diameter and made of a first metal including copper;
 - hot dip galvanizing the intermediate wire through a molten bath of a second metal having vaporization temperature lower than the first metal for a desired time and

temperature, wherein an alloy layer is formed on the intermediate wire by diffusion reaction of the first metal and the second metal, having hardness higher and lower elongation than the first metal and second metal, and wherein a coating layer is formed on the alloy layer; and drawing the intermediate wire having the alloy layer and the coating layer to form a coated electrode wire having a second diameter, wherein cracks are formed during the drawing step in the alloy layer and the coating layer due to the high hardness and low elongation.

Reviewed Ground of Unpatentability

The Board instituted trial to review the patentability of the challenged claims on the following ground:

Claims Challenged	Basis	Reference
1–4, 6, 9–11, and 14–18	§ 102	Mukherjee ¹

ANALYSIS

Claim Construction

In an *inter partes* review, the Board interprets a claim term in an unexpired patent according to its broadest reasonable construction in light of the specification of the patent in which it appears. 37 C.F.R. § 42.100(b). Under that standard, absent any special definitions, we assign claim terms their ordinary and customary meaning, as understood by a person of ordinary skill in the art, in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Only terms which are in controversy need to be construed, and then only to the extent

¹ Mukherjee, U.S. Patent No. 5,808,262, issued Sept. 15, 1998 (Ex. 1002, “Mukherjee”).

necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999). For this reason, we do not construe terms for which constructions were proposed during the trial but for which construction is not necessary to resolve this case.

In our Institution Decision, we addressed, but did not construe, the terms “elongation,” certain product-by-process terms, and “cracks.” Dec. 6–8. The parties do not contest our treatment of the terms “elongation” or the product-by-process terms in the Institution Decision. *See* PO Resp. 7–9; Reply. Accordingly, with respect to these terms, we maintain the position taken in the Institution Decision that we did not need to construe these terms. Dec. 6–8.

Regarding the term “cracks,” which we determined in our Institution Decision was not necessary to construe (Dec. 8), Patent Owner argues that the term “cracks” in claims 1 and 14 should be construed to mean “narrow breaks.” PO Resp. 7–9. Petitioner, when asked at oral hearing if it disagreed with Patent Owner’s construction, indicated that Patent Owner’s construction was “fine.” Tr. 18:3–21. In the absence of controversy about the construction of the term, we construe “cracks” as “narrow breaks.”

Prior Art Disclosure

Mukherjee

Mukherjee relates to “[a] process of manufacturing [a] spark erosion electrode . . . for use in electrical discharge machining, the core of the electrode being of comparatively low zinc alpha brass with top layer of highly rich zinc beta and gamma brass.” Ex. 1002, at [57]. Mukherjee discloses using a core wire made from brass containing 61.5% copper. *Id.*

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