NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

ENZO LIFE SCIENCES, INC.,
Appellant

v.

BECTON, DICKINSON AND COMPANY,
Appellee

UNITED STATES,
Intervenor

2018-1232, 2018-1233

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2016-00820, IPR2016-00822.

Decided: August 16, 2019

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Before LOURIE, O'MALLEY, and CHEN, *Circuit Judges*.

LOURIE, *Circuit Judge*.

Enzo Life Sciences, Inc. appeals from two final written decisions of the United States Patent and Trademark Office ("PTO") Patent Trial and Appeal Board ("the Board") holding various claims of U.S. Patent 7,064,197 ("the '197 patent") unpatentable as anticipated or obvious. *See Hologic, Inc. v. Enzo Life Scis., Inc.*, No. IPR2016-00820, 2017 WL 4339646 (P.T.A.B. Sept. 28, 2017) ("*'820 Decision*"); *Hologic, Inc. v. Enzo Life Scis., Inc.*, No. IPR2016-00822, 2017 WL 4407743 (P.T.A.B. Oct. 2, 2017) ("*'822 Decision*"). The PTO intervened to defend the constitutionality challenge to *inter partes* review ("IPR") proceedings as applied to patents issued before the enactment of the America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284 (2011). For the following reasons, we *affirm*.

BACKGROUND

Deoxyribonucleic acid ("DNA") and ribonucleic acid ("RNA") are nucleic acids made of a series of nucleotides. A nucleotide is composed of a sugar, a phosphate, and a nitrogenous base. DNA has four nitrogenous bases: adenine (A), guanine (G), cytosine (C), and thymine (T). RNA also has the bases adenine (A), guanine (G), and cytosine (C), but contains uracil (U) instead of thymine (T). A

polynucleotide refers to multiple nucleotides linked together in a chain. Two strands of polynucleotides can bind to one another, *i.e.*, hybridize, through hydrogen bonding between complementary nucleotides known as Watson-Crick base pairing: bases T or U pair with A, and G pairs with C. A strand of nucleotides that is not hybridized to another strand is said to be single-stranded, while two strands hybridized to each other are said to be double-stranded.

Enzo owns the '197 patent directed to "the detection of genetic material by polynucleotide probes." '197 patent col. 1 ll. 23–24. The invention leverages hybridization techniques to detect the presence of an analyte, which may be "a DNA or RNA molecule," "a molecular complex," or "a biological system containing nucleic acids, such as a virus, a cell, or group of cells." *Id.* col. 1 ll. 39–42. A polynucleotide probe that is complementary to a target analyte will hybridize with it and is thereby used to detect that analyte's presence. *See id.* col. 2 ll. 37–63. According to the invention, the analytes to be detected are "fixed . . . in hybridizable form to [a] non-porous solid support." *Id.* col. 13 ll. 63–67; *see also id.* col. 5 ll. 58–60. The specification also discloses that a "technique for improving the fixing or uniformity of the plastic surface for fixing DNA involves treatment of the surface with polylysine." *Id.* col. 11 ll. 37–39.

Independent claim 1 is representative of the claims challenged in IPR2016-00820 ("the '820 IPR") and independent claim 17 is representative of the claims challenged in IPR2016-00822 ("the '822 IPR"):

> 1. A *non-porous solid support* comprising one or more amine(s), hydroxyl(s) or epoxide(s) thereon, wherein at least one single-stranded nucleic acid is fixed or immobilized in *hybridizable form* to said non-porous solid support via said one or more amine(s), hydroxyl(s) or epoxide(s).

Id. col. 13 ll. 63–67 (emphases added).

> 17. An *array* comprising various single-stranded nucleic acids fixed or immobilized in *hybridizable form* to a non-porous solid support.

Id. col. 15 ll. 51–53 (emphases added).

Hologic, Inc. filed two petitions for IPR of the '197 patent. During both proceedings, Becton, Dickinson, & Company ("Becton") moved to join as a co-petitioner, and the Board granted the motions. *See* Joinder Order at 2, *Hologic, Inc. v. Enzo Life Scis., Inc.*, No. IPR2016-00820 (P.T.A.B. Mar. 27, 2017), Paper No. 32; Joinder Order at 2, *Hologic, Inc. v. Enzo Life Scis., Inc.*, No. IPR2016-00822 (P.T.A.B. Apr. 5, 2017), Paper No. 31. The Board instituted trial on all eight grounds of unpatentability across the two IPRs, which all rely on Fish[1] or VPK[2] as the primary reference.

The Board determined that all the challenged claims were unpatentable as anticipated by Fish or rendered obvious by Fish alone or in combination with other prior art references. *'820 Decision*, 2017 WL 4339646, at *11–15; *'822 Decision*, 2017 WL 4407743, at *10–15. The Board next determined that VPK qualified as a prior art reference. *'820 Decision*, 2017 WL 4339646, at *15–18; *'822 Decision*, 2017 WL 4407743, at *15–18. The Board found that the '197 patent could not claim priority from its original parent application's filing date of January 27, 1983,

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[1] Falk Fish & Morris Ziff, *A Sensitive Solid Phase Microradioimmunoassay for Anti-Double Stranded DNA Antibodies*, 24 Arthritis and Rheumatism 534–43 (Mar. 1981), J.A. 1266–75 ("Fish").

[2] A.C. van Prooijen-Knegt et al., *In Situ Hybridization of DNA Sequences in Human Metaphase Chromosomes Visualized by an Indirect Fluorescent Immunocytochemical Procedure*, 141 Experimental Cell Research 397–407 (Oct. 1982), J.A. 1288–98 ("VPK").

because that application did not provide written description support for the claimed "non-porous solid support." *See, e.g.*, '197 patent col. 13 l. 63. Instead, the Board determined that the '197 patent could only claim priority from the 1983 application's child continuation-in-part application, which was filed on May 9, 1985. VPK was publicly available as of October 1982, more than a year before the critical date of May 9, 1985, and thus qualified as prior art. *See* 35 U.S.C. § 102(b) (2006). The Board then concluded that all the challenged claims were anticipated by VPK or would have been obvious over VPK in combination with other prior art references. *'820 Decision*, 2017 WL 4339646, at *19–24; *'822 Decision*, 2017 WL 4407743, at *20–23.

Enzo appeals. The PTO intervened pursuant to 35 U.S.C. § 143 to defend against Enzo's constitutionality challenge to IPRs as applied to the '197 patent because it issued on June 20, 2006, which is before the enactment of the AIA in 2011. Enzo argues that constitutes a violation of the Fifth Amendment. Before this case was argued, Hologic moved to withdraw as a party to this appeal, and this court granted the motion. *See Enzo Life Scis., Inc. v. Becton, Dickinson & Co.*, Nos. 2018-1232, 2018-1233 (Fed. Cir. Apr. 25. 2019), ECF No. 74. Becton remains as appellee. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

We review the Board's legal determinations *de novo*, and the Board's factual findings underlying those determinations for substantial evidence. *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015). A finding is supported by substantial evidence if a reasonable mind might accept the evidence to support the finding. *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938).

Anticipation is a question of fact that we review for substantial evidence. *In re Rambus, Inc.*, 753 F.3d 1253, 1256 (Fed. Cir. 2014). A prior art document may anticipate a

claim if it describes every element of the claimed invention, either expressly or inherently. *Husky Injection Molding Sys. Ltd. v. Athena Automation Ltd.*, 838 F.3d 1236, 1248 (Fed. Cir. 2016). Whether there are inherent teachings in a prior art reference is a question of fact. *See In re Napier*, 55 F.3d 610, 613 (Fed. Cir. 1995).

Obviousness is a question of law based on underlying factual findings, 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 any objective indicia of non-obviousness." *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013) (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007)).

I. ANTICIPATION BY FISH

The Board determined that claims 1, 6, 8, 9, 12–16, 27, 32–34, 41, 61–63, 69, 70, 72–74, 79, 100, 191, 193, 194, 212, 213, 219, 222, 225–227, 230, 233, and 236 in the '820 IPR and claims 17, 19, 25, 105, 106, 114, 116, 119, 128, 129, 150, 152, 178, 180, 186, and 187 in the '822 IPR were anticipated by Fish. *'820 Decision*, 2017 WL 4339646, at *11–12; *'822 Decision*, 2017 WL 4407743, at *10–11. Fish teaches a microradioimmunoassay for detecting antibodies that bind to double-stranded DNA ("dsDNA"). *See* J.A. 1266. It further notes the use of poly-L-lysine ("PLL") "to facilitate the binding of pure dsDNA to plastic surfaces." *Id.* Fish also discloses experiments using single-stranded DNA ("ssDNA") in the form of a mixture of synthetic polymers deoxyadenosine ("poly-dA") and deoxycytidine ("poly-dC") or "denatured calf thymus DNA." J.A. 1268.

All of the challenged independent claims in both the '820 IPR and '822 IPR require the single-stranded nucleic acid to be "fixed or immobilized in *hybridizable form*" (the "hybridizable form limitation"). *See, e.g.*, '197 patent col. 13 l. 65, col. 15 l. 52. The Board construed "hybridizable form" to mean "*capable* of binding through Watson-Crick base pairing," adopting the parties' agreed-upon

construction. *'820 Decision*, 2017 WL 4339646, at *5 (emphasis added).[3] The Board further clarified the construction in its final written decisions to mean that "it has bases available for base-pairing." *Id.* at *6.

Based on its construction, the Board found that Fish disclosed the hybridizable form limitation. The Board found that Fish teaches ssDNA bound to the PLL-coated wells. *See id.* at *8. The Board further found that being capable of hybridizing is the inherent result of ssDNA being fixed to PLL-treated non-porous solid supports. *See id.* at *10–11. The Board rejected Enzo's argument that Fish failed to disclose hybridization and found that "actual hybridization is not a requirement of any challenged claim." *Id.* at *10. The claims only recite "hybridizable form," and the Board noted that the parties' stipulated construction required that the single-stranded nucleic acid be "*capable* of binding through Watson-Crick base pairing" and did not require "actual hybridization." *Id.* (citations omitted). The Board thus concluded that the challenged claims were anticipated by Fish. *Id.* at *11–12.

On appeal, Enzo argues that Fish does not disclose nucleic acid hybridization, but instead describes "binding radioactively-labeled antibodies" to dsDNA. Appellant's Br. 24 (emphasis omitted). Moreover, Enzo contends, as it did before the Board, that the nucleic acids in Fish did not actually hybridize in any of the experiments, and thus the finding that Fish discloses hybridization lacks substantial evidence. According to its expert, Dr. Buck, the fact that a single-stranded nucleic acid exists does not mean it is in hybridizable form. For example, Dr. Buck testified that "a nucleic acid may be 'restricted by the bonds formed between the nucleic acid and the support' or inhibited by

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[3] The claim construction discussions of the two Board opinions are identical. Thus, citations regarding the Board's claim construction will only be to the *'820 Decision*.

'entanglement of the nucleic acid strands themselves, which may form loops and coils, called secondary structures, restricting the diffusion of other nucleic acid strands available for hybridization.'" *Id.* at 25 (quoting J.A. 3630–31 ¶ 95, 5605–06 ¶ 95). Enzo also argues that Dr. Nelson, the petitioners' expert, failed to apply the modified claim construction and thus his testimony cannot constitute substantial evidence for the Board's findings.

Becton responds that the Board correctly found that Fish inherently discloses the hybridizable form limitation. Relying on Dr. Nelson's testimony, Becton argues that the positively-charged amines on the surface of the solid support coated with PLL, as disclosed in Fish, will bond with the negatively-charged phosphate groups in the DNA backbone leaving the bases free to hybridize. Becton criticizes Enzo for "deliberately sabotaging the experiment" in order to describe a situation where someone using Fish's PLL binding chemistry would not create a hybridizable single-stranded nucleic acid. Appellee's Br. 37. Becton contends that inherency cannot be defeated by "interfer[ing] with the natural result of a process." *Id.* at 38.

We agree with Becton that Fish's disclosure of a ssDNA bound to a solid support coated with PLL inherently discloses that the single-stranded nucleic acid is in hybridizable form. "A reference includes an inherent characteristic if that characteristic is the 'natural result' flowing from the reference's explicitly explicated limitations." *Eli Lilly & Co. v. Barr Labs., Inc.*, 251 F.3d 955, 970 (Fed. Cir. 2001) (quoting *Cont'l Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991)).

Here, substantial evidence supports the Board's finding that the single-stranded nucleic acid of Fish is inherently hybridizable. The Board reasonably relied on testimony from both experts that a characteristic of single-stranded nucleic acids is that their bases are available to pair with complementary bases through Watson-Crick

pairing. *See '820 Decision*, 2017 WL 4339646, at *11 (citing J.A. 891 ¶ 64); *'822 Decision*, 2017 WL 4407743, at *9; *see also* J.A. 874–75 ¶ 24, 891 ¶ 64 (Dr. Nelson's testimony); J.A. 3705–06 ¶ 189 (Dr. Buck's testimony). That is what a single-stranded nucleic acid does in the presence of complementary bases. Unless purposely prohibited, the binding capability is inherent in the nature of a single-stranded nucleic acid. The Board's finding that Fish's disclosure of a ssDNA fixed to a PLL-treated support inherently teaches the hybridizable form limitation is thus based on substantial evidence.

Enzo also argues that in the '822 IPR, the Board erred in finding that Fish disclosed an "array" of "single-stranded nucleic acids." *See, e.g.*, '197 patent col. 15 ll. 51–53. All of the challenged independent claims in the '822 IPR recite an "array" of "single-stranded nucleic acids." *See, e.g.*, *id.* The Board construed "array" to include "an orderly grouping or arrangement of wells or depressions." *'822 Decision*, 2017 WL 4407743, at *4. The Board then found that Fish teaches this limitation because "it discloses microtitration trays having wells of ssDNA." *Id.* at *7 (citing J.A. 1268).

Enzo contends that Fish fails to disclose an "array" of "*single-stranded nucleic acids*." *See, e.g.*, '197 patent col. 15 ll. 51–53 (emphasis added). According to Enzo, the Board erred in reading the term "array" in isolation from "single-stranded nucleic acids," and thus erred in finding that a container with wells or depressions without any nucleic acids would meet the claim language.

Becton responds, and we agree, that the Board's finding was supported by substantial evidence. Fish describes supports having rows of wells coated with ssDNA. *See* J.A. 1268. The Board also credited Dr. Nelson's testimony that Table 1 in Fish provides evidence that the ssDNA bound effectively to the PLL-coated wells of the microtitration tray. *'822 Decision*, 2017 WL 4407743, at *7 (citing J.A. 1268). That constitutes substantial evidence to support the

Board's finding that Fish teaches an "array" of "single-stranded nucleic acids." *See, e.g.*, '197 patent col. 15 ll. 51–53.

Enzo does not raise any arguments with respect to any other claim limitation, nor does it separately argue the dependent claims. Thus, the dependent claims stand or fall together with the independent claims. *See In re Kaslow*, 707 F.2d 1366, 1376 (Fed. Cir. 1983). We therefore conclude that the Board did not err in finding that Fish anticipates claims 1, 6, 8, 9, 12–16, 27, 32–34, 41, 61–63, 69, 70, 72–74, 79, 100, 191, 193, 194, 212, 213, 219, 222, 225–227, 230, 233, and 236 in the '820 IPR and claims 17, 19, 25, 105, 106, 114, 116, 119, 128, 129, 150, 152, 178, 180, 186, and 187 in the '822 IPR.

II. OBVIOUSNESS GROUNDS BASED ON FISH

The Board determined that claims 31, 64, 68, 101, 192, and 195 in the '820 IPR and claims 130, 131, 151, and 154 in the '822 IPR would have been obvious over Fish. *'820 Decision*, 2017 WL 4339646, at *12–14; *'822 Decision*, 2017 WL 4407743, at *11–14. Those claims add one of the following limitations: "wherein said nucleic acid comprises a nucleic acid sequence complementary to a nucleic acid sequence of interest sought to be identified, quantified or sequenced," *see, e.g.*, '197 patent col. 17 ll. 1–4; or "wherein said nucleic acid is RNA," *see, e.g.*, *id.* col. 18 ll. 38–39; or "wherein said nucleic acids comprise a gene sequence or pathogen sequence," *id.* col. 22 ll. 42–43. Enzo does not separately argue the challenged dependent claims and relies on the arguments it raised for anticipation by Fish. Thus, for the same reasons that Fish anticipates the aforementioned claims, we also hold that Fish renders obvious claims 31, 64, 68, 101, 192, and 195 in the '820 IPR and claims 130, 131, 151, and 154 in the '822 IPR.

The Board next determined that claims 38, 78, and 218 in the '820 IPR and claims 113 and 185 in the '822 IPR

would have been obvious over Fish and Gilham;[4] and claims 120 and 189 in the '822 IPR would have been obvious over Fish, U.S. Patent 3,572,892 ("Metzgar"), and Sato.[5] Enzo argues that the Board's findings of a motivation to combine Fish and Gilham, and Fish, Metzgar, and Sato, are not based on substantial evidence. We take the arguments asserted for each ground in turn.

A. Obviousness over Fish and Gilham

The Board determined that claims 38, 78, and 218 in the '820 IPR and claims 113 and 185 in the '822 IPR would have been obvious over Fish and Gilham. *'820 Decision*, 2017 WL 4339646, at *14–15; *'822 Decision*, 2017 WL 4407743, at *14–15. The challenged claims add the limitation "wherein said fixation or immobilization to said non-porous solid support is *covalent*." *See, e.g.*, '197 patent col. 17 ll. 24–26 (emphasis added). Gilham teaches a method of covalently binding RNA to cellulous supports. *See* J.A. 1592–93. The Board found that a person of ordinary skill in the art would have been motivated, with a reasonable expectation of success, to apply Gilham's method of covalently binding RNA to Fish's non-porous supports, such as the microtitration plates, "because covalent binding provides a stronger linkage between the immobilized nucleic acids and the solid substrate." *'820 Decision*, 2017 WL 4339646, at *15 (internal citation omitted).[6]

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[4] P.T. Gilham, *Immobilized Polynucleotides and Nucleic Acids*, Immobilized Biochemicals and Affinity Chromatography 173–85 (1974), J.A. 1592–1604 ("Gilham").

[5] Chikako Sato et al., *Cell Surface Charge and Cell Division in Escherichia coli after X Irradiation*, 87 Radiation Research 646–56 (1981), J.A. 4422–32 ("Sato").

[6] The analyses of Fish and Gilham are identical in the two Board opinions. Thus, citations will only be to the *'820 Decision*.

Enzo argues that the Board failed to identify why a person of ordinary skill would have been motivated to use the covalent binding method for RNA in Gilham with the procedures for using DNA of PLL-coated plates to detect antibodies described in Fish. Moreover, according to Enzo, not only was there insufficient motivation to combine, but there would not have been an expectation of success. Enzo contends that Gilham teaches away from the use of non-porous supports like those in Fish, and that Gilham's covalent binding would likely negatively affect the nucleic acid's ability to hybridize.

Becton responds that the Board's finding of a motivation to combine Fish and Gilham was supported by substantial evidence. We agree. Dr. Nelson, whom the Board credited, explained that both Fish and Gilham disclose nucleic acids bound to solid support surfaces with amine groups. *See id.* at *13–14. The Board then found that a person of ordinary skill in the art would have been motivated to use the covalent binding from Gilham on Fish's non-porous solid supports. *See id.* at *15. We also agree with Becton that Enzo's teaching away arguments improperly attack the references individually. *See In re Merck & Co.*, 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."). However, as the Board determined, it is the combined teachings of Gilham's chemistry for binding RNA in hybridizable form and Fish's methods of attaching nucleic acids to non-porous supports that render the claims obvious. *See '820 Decision*, 2017 WL 4339646, at *15. Accordingly, the Board did not err in holding that claims 38, 78, and 218 in the '820 IPR and claims 113 and 185 in the '822 IPR would have been obvious over Fish and Gilham.

B. Obviousness over Fish, Metzgar, and Sato

The Board determined that claims 120 and 189 in the '822 IPR would have been obvious over Fish, Metzgar, and Sato. *'822 Decision*, 2017 WL 4407743, at *13–14. The challenged claims add the limitation "wherein said non-porous solid support comprises *one or more hydroxyls*." *See, e.g.*, '197 patent col. 21 ll. 10–12 (emphasis added). Metzgar teaches a "multiple well tissue culture microscope slide" where the microscope slide is "glass or other transparent material." Metzgar col. 1 l. 2, col. 2 ll. 28–29. Sato discloses treating glass slides with PLL. *See* J.A. 4423. Dr. Nelson testified that "glass necessarily includes hydroxyl groups." *'822 Decision*, 2017 WL 4407743, at *14 (citing J.A. 5789 ¶ 83 ("The glass slides of . . . Metzgar necessarily include hydroxyl groups, because that is a known property of glass.")). The Board determined, based on Dr. Nelson's testimony, that a person of ordinary skill in the art would have been motivated to use the glass trays from Metzgar "as an alternative to Fish's polyvinyl trays." *Id.* (citing J.A. 5789 ¶ 83). In combination with Sato's teaching of treating glass slides with PLL, the Board concluded that the challenged claims would have been obvious over Fish, Metzgar, and Sato. *Id.*

Enzo argues that the Board failed to identify why a person of ordinary skill in the art would have been motivated to substitute glass plates for the polyvinyl microtitration trays disclosed in Fish. According to Enzo, the Board erred in failing to credit Dr. Buck's uncontested testimony that a person of ordinary skill would not combine those references because they would not work for their intended purposes.

Becton responds that substantial evidence supported the Board's finding of a motivation to combine Fish, Metzgar, and Sato, and we agree. The Board found that glass slides having wells or depressions were well-known at the time of the invention. *See id.* The Board further found, based on Dr. Nelson's testimony, that a person of

ordinary skill in the art would have been motivated to immobilize nucleic acids using the methods described in Fish on the glass slides disclosed in Metzgar. *See id.* Additionally, the Board found that Sato teaches "treatment of glass slides with PLL prior to fixing cells on the slides." *Id.* The Board ultimately credited Dr. Nelson's testimony that a person of ordinary skill in the art would have been motivated to perform the nucleic acid immobilization procedure disclosed in Fish on the glass slides in Metzgar treated with PLL as disclosed in Sato. *Id.* The Board's finding of a motivation to combine was thus based on substantial evidence. Accordingly, the Board did not err in determining that claims 120 and 189 in the '822 IPR would have been obvious over Fish, Metzgar, and Sato.

In conclusion, we determine that the Board did not err in holding that claims 1, 6, 8, 9, 12–17, 19, 25, 27, 31–34, 38, 41, 61–64, 68–70, 72–74, 78, 79, 100, 101, 105, 106, 113, 114, 116, 119, 120, 128–131, 150–152, 154, 178, 180, 185–187, 189, 191–195, 212, 213, 218, 219, 222, 225–227, 230, 233, and 236 of the '197 patent are invalid as anticipated by Fish or obvious over Fish alone or in combination with other prior art references.

III. OTHER ISSUES

Enzo argues that the Board erred in finding that VPK qualifies as prior art, and thus the claims are not unpatentable as anticipated or obvious over grounds that include VPK. Because we have determined that the Board did not err in concluding that all of the challenged claims are unpatentable on grounds based on Fish, we need not reach the arguments involving VPK. *See* Oral Arg. at 12:14–12:49, 25:58–26:11, *Enzo Life Scis., Inc. v. Becton, Dickinson & Co.*, Nos. 2018-1232, 2018-1233 (Fed. Cir. July 9, 2019), http://oralarguments.cafc.uscourts.gov/default.aspx?fl=2018-1232.mp3.

Enzo also argues that the IPR process as applied retroactively to patents that issued before the enactment of the

AIA violates the Fifth Amendment. We recently addressed this issue in *Celgene Corp. v. Peter*, No. 18-1167, 2019 WL 3418549, at *12–16 (Fed. Cir. July 30, 2019), which is now precedent that governs this case. *Celgene* held that "retroactive application of IPR proceedings to pre-AIA patents is not an unconstitutional taking under the Fifth Amendment." *Id.* at *16. Accordingly, we hold that the retroactive application of IPR proceedings to the '197 patent, which issued before the enactment of the AIA, is not an unconstitutional taking under the Fifth Amendment.

CONCLUSION

We have considered Enzo's remaining arguments but find them unpersuasive. For the foregoing reasons, we *affirm* the decisions of the Board.

AFFIRMED