

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

GS CLEANTECH CORPORATION,
Plaintiff-Appellant

v.

ADKINS ENERGY LLC,
Defendant-Cross-Appellant

2016-2231, 2017-1838

Appeals from the United States District Court for the Northern District of Illinois in No. 1:10-cv-04391, Judge Larry J. McKinney.

GS CLEANTECH CORPORATION, GREENSHIFT CORPORATION,
Plaintiffs-Appellants

CANTOR COLBURN LLP
Interested Party

v.

BIG RIVER RESOURCES GALVA, LLC, BIG RIVER RESOURCES WEST BURLINGTON, LLC, LINCOLNLAND AGRI-ENERGY, LLC, IROQUOIS BIO-ENERGY COMPANY, LLC, CARDINAL ETHANOL, LLC, LINCOLNWAY ENERGY, LLC,

**ICM, INC., BUSHMILLS ETHANOL, INC., AL-CORN
CLEAN FUEL, LLC, CHIPPEWA VALLEY
ETHANOL COMPANY, LLP, HEARTLAND CORN
PRODUCTS, GEA MECHANICAL EQUIPMENTUS,
INC., AS SUCCESSOR-IN-INTEREST TO GEA
WESTFALIA SEPARATOR, INC. PURSUANT TO
THE NOTICE OF MERGER FILED ON 4/28/2011,
ACE ETHANOL, LLC, BLUE FLINT ETHANOL LLC,
UNITED WISCONSIN GRAIN PRODUCERS, LLC,
FLOTTWEG SEPARATION TECHNOLOGY, INC.,
ADKINS ENERGY LLC, AEMETIS, INC., AEMETIS
ADVANCED FUELS KEYES, INC., LITTLE SIOUX
CORN PROCESSORS, LLLP, GUARDIAN ENERGY,
LLC, WESTERN NEW YORK ENERGY, LLC,
SOUTHWEST IOWA RENEWABLE ENERGY, LLC,
PACIFIC ETHANOL MAGIC VALLEY LLC,
PACIFIC ETHANOL STOCKTON, HOMELAND
ENERGY SOLUTIONS, LLC, PACIFIC ETHANOL,
INC., DAVID J. VANDER GRIEND,
*Defendants-Appellees***

2017-1832

Appeal from the United States District Court for the
Southern District of Indiana in Nos. 1:10-cv-00180-RLM-
DML, 1:10-cv-08000-RLM-DML, 1:10-cv-08001-RLM-
DML, 1:10-cv-08002-RLM-DML, 1:10-cv-08003-RLM-
DML, 1:10-cv-08004-RLM-DML, 1:10-cv-08005-RLM-
DML, 1:10-cv-08006-RLM-DML, 1:10-cv-08007-RLM-
DML, 1:10-cv-08008-RLM-DML, 1:10-cv-08009-RLM-
DML, 1:10-cv-08010-RLM-DML, 1:10-cv-08011-RLM-
DML, 1:10-ml-02181-RLM-DML, 1:13-cv-08012-RLM-
DML, 1:13-cv-08013-RLM-DML, 1:13-cv-08014-RLM-
DML, 1:13-cv-08015-RLM-DML, 1:13-cv-08016-RLM-
DML, 1:13-cv-08017-RLM-DML, 1:13-cv-08018-RLM-

GS CLEANTECH CORP. v. ADKINS ENERGY LLC

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DML, 1:14-cv-08019-RLM-DML, 1:14-cv-08020-RLM-DML, Judge Larry J. McKinney.

Decided: March 2, 2020

STEVEN B. POKOTILOW, Stroock & Stroock & Lavan LLP, New York, NY, argued for plaintiffs-appellants. Also represented by BINNI N. SHAH.

JOHN M. WEYRAUCH, Dicke, Billig & Czaja, PLLC, Minneapolis, MN, argued for defendants-appellees Big River Resources Galva, LLC, Big River Resources West Burlington, LLC, Lincolnland Agri-Energy, LLC, Cardinal Ethanol, LLC, Lincolnway Energy, LLC, ICM, Inc., Flottweg Separation Technology, Inc., Blue Flint Ethanol, LLC, David J. Vander Griend. Defendants-appellees Big River Resources Galva, LLC, Big River Resources West Burlington, LLC, Lincolnland Agri-Energy, LLC, Cardinal Ethanol, LLC, ICM, Inc., Flottweg Separation Technology, Inc., Little Sioux Corn Processors, LLLP, Guardian Energy, LLC, Western New York Energy, LLC, Southwest Iowa Renewable Energy, LLC, Pacific Ethanol Magic Valley LLC, David J. Vander Griend also represented by PETER R. FORREST.

MICHAEL BUCHANAN, Patterson Belknap Webb & Tyler LLP, New York, NY, argued for defendants-appellees ACE Ethanol, LLC, Aemetis Advanced Fuels Keyes, Inc., Aemetis, Inc., Al-Corn Clean Fuel, LLC, Big River Resources Galva, LLC, Big River Resources West Burlington, LLC, Blue Flint Ethanol LLC, Bushmills Ethanol, Inc., Cardinal Ethanol, LLC, Chippewa Valley Ethanol Company, LLP, Flottweg Separation Technology, Inc., GEA Mechanical Equipment US, Inc., Guardian Energy, LLC, Heartland Corn Products, Homeland Energy Solutions, LLC, ICM, Inc., Iroquois Bio-Energy Company, LLC,

Lincolnland Agri-Energy, LLC, Lincolnway Energy, LLC, Little Sioux Corn Processors, LLLP, Pacific Ethanol Magic Valley LLC, Pacific Ethanol Stockton, Pacific Ethanol, Inc., Southwest Iowa Renewable Energy, LLC, United Wisconsin Grain Producers, LLC, David J. Vander Griend, Western New York Energy, LLC, Adkins Energy LLC.

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GLENN JOHNSON, McKee, Voorhees & Sease, P.L.C., Des Moines, IA, for defendant-appellee Lincolnway Energy, LLC.

JOHN DONALD BEST, Michael Best & Friedrich, LLP, Madison, WI, for defendants-appellees Bushmills Ethanol, Inc., Chippewa Valley Ethanol Company, LLP, Heartland Corn Products, United Wisconsin Grain Producers, LLC. Also represented by KENNETH M. ALBRIDGE, III, JOHN C. SCHELLER.

MARC ANDRE AL, Stoel Rives LLP, Minneapolis, MN, for defendant-appellee Al-Corn Clean Fuel, LLC.

RUTH RIVARD, Stinson LLP, Minneapolis, MN, for defendant-appellee Blue Flint Ethanol LLC.

CAMILLE L. URBAN, Brown, Winick, Graves, Gross, Baskerville & Schoenebaum, PLC, Des Moines, IA, for defendants-appellees Aemetis, Inc., Aemetis Advanced Fuels Keyes, Inc., Pacific Ethanol Stockton, Homeland Energy

Solutions, LLC, Pacific Ethanol, Inc. Also represented by
MICHAEL A. DEE.

Before REYNA, WALLACH, and HUGHES, *Circuit Judges*.
WALLACH, *Circuit Judge*.

The U.S. District Court for the Southern District of Indiana (“District Court”) found Appellants GS CleanTech Corporation and Greenshift Corporation’s (together, “CleanTech”) U.S. Patent Nos. 7,601,858 (“the ’858 patent”), 8,008,516 (“the ’516 patent”), 8,008,517 (“the ’517 patent”), and 8,283,484 (“the ’484 patent”) (together, “the Patents-in-Suit”) unenforceable due to inequitable conduct. Corrected Memorandum Opinion & Order after Bench Trial, *In re: Method of Processing Ethanol Byproducts & Related Subsystems (’858) Patent Litig.*, No. 1:10-ml-02181-LJM-DML (S.D. Ind. Sept. 15, 2016), ECF No. 1653 (J.A. 236–313) (Opinion and Order); *see* J.A. 314–15 (Judgment).

CleanTech appeals. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1) (2012). We affirm.

BACKGROUND

I. The Patents-in-Suit¹

The Patents-in-Suit are directed to the recovery of oil from a dry mill ethanol plant’s byproduct, called thin stillage. ’858 patent, Abstract.² The Patents-in-Suit disclose

¹ The Patents-in-Suit share a specification. For the ease of reference here, we will refer to the ’858 patent’s specification.

² Stillage treatment relates to the process of treating “whole stillage[,]” which is the “waste stream comprised of byproducts” that is a result of the dry milling process. ’858 patent col. 1 ll. 35–41. Dry milling is “a popular method of

a method of “successful” “recover[y] [of] the valuable oil from th[e] [thin stillage] byproduct,” *id.* col. 1 ll. 52–53, by, for example, “evaporating the thin stillage to form a concentrate,” *id.* col. 2 ll. 23–25, or syrup, and then “separating the oil from the concentrate using a disk stack centrifuge,” *id.* col. 2 ll. 25–27.

Independent claim 8 of the ’858 patent recites:

A method of recovering oil from thin stillage, comprising, in sequence: evaporating the thin stillage to create a concentrate having a moisture content of greater than 30% by weight and less than about 90% by weight; and centrifuging the concentrate to recover oil.

Id. col. 6 ll. 26–30.³ Independent claims 1, 10, and 16 include a separate post-evaporation heating step. *Id.* col. 5 l. 65–col. 6 l. 7 (Independent Claim 1), col. 6 ll. 34–42 (Independent Claim 10), col. 6 ll. 59–64 (Independent Claim 16). All dependent claims recite various combinations of temperature, pH, or moisture content ranges for the syrup or the use of the centrifuge. *Id.* col. 6 ll. 8–33, 43–58. Independent claim 30 of the ’484 patent similarly recites a “method of recovering oil from thin stillage[,]” except it is by “mechanically processing the thin stillage concentrate” instead of centrifugation. ’484 patent col. 8 ll. 29–37.

producing ethanol . . . [and] is typically practiced using corn.” *Id.* col. 1 ll. 35–37. Whole stillage, which has commonly been treated as waste, “may be further separated into products known as distillers wet grains and ‘thin stillage.’” *Id.* col. 1 ll. 41–43.

³ Independent claim 8, which is illustrative, broadly recites the claimed invention. The remaining claims recite additional limitations beyond those recited in independent claim 8.

Independent claim 1 of the '516 patent provides the additional step of “evaporating water from the thin stillage to form a thin stillage concentrate.” '516 patent col. 6 ll. 11–19. Independent claim 7 includes the additional step of “separating distiller wet grains and thin stillage from the whole stillage” and using a disk stack centrifuge to separate the “oil from the thin stillage concentrate.” *Id.* col. 6 ll. 34–42. Independent claim 1 of the '517 patent also recites the creation of the thin stillage concentrate, within a broader moisture content range. '517 patent col. 6 ll. 32–37.

II. Factual History⁴

A. Development of the Ethanol Oil Recovery System

In 2000, David Cantrell founded Vortex Dehydration Technology (“VDT”), J.A. 117, with the purpose of selling products and methods of processing factory waste for resale, J.A. 118. In 2002, David Winsness joined VDT as its Chief Technology Officer. J.A. 117. Later in 2002, Messrs. Cantrell and Winsness (collectively, “the Inventors”) met Greg Barlage, a “market unit manager for equipment sales” at the company Alfa Laval AB, which sold animal and vegetable oil processing equipment. J.A. 117, 118. Mr. Barlage approached the Inventors with the proposal that VDT use Alfa Laval oil processing equipment—such as evaporators and centrifuges—in its processes. J.A. 119. Soon, the Inventors began developing an oil recovery product specifically designed for animal processing waste products, using centrifuges provided by Alfa Laval. J.A. 119.

Relevant here, VDT maintained a business relationship with Agri-Energy LLC (“Agri-Energy”), J.A. 121, which operated a dry-mill ethanol plant in Minnesota,

⁴ We will rely on the District Court’s factual recitation where it is uncontested by the parties. Where certain facts are disputed, we will refer to the record evidence.

J.A. 120.⁵ Starting sometime before June 2003, Mr. Cantrell shifted his focus from meat and fish byproduct processing to the creation of an ethanol oil recovery system and hired employees from Alfa Laval and Agri-Energy, as well as a marketing team. J.A. 122. In June 2003, Mr. Cantrell sent an email to two Agri-Energy employees, including one named George Winter, that included information about how VDT's oil recovery system for processed animal waste might be applicable in an ethanol plant, as well as an image of an oil recovery system with a centrifuge and an operational cost spreadsheet. J.A. 123. Subsequently, Mr. Cantrell informed Mr. Barlage that Agri-Energy would send Mr. Barlage a sample of its "thin stillage

⁵ The District Court discounted testimony provided by Mr. Cantrell at the bench trial, determining that Mr. Cantrell's testimony "on any topic [to be] of little credible value." J.A. 242. The District Court noted that Mr. Cantrell made "inconsistent statements," "had some difficulty staying focused," and "was argumentative and unclear about facts when questioned by [Appellees'] counsel." J.A. 242–43. The District Court stated that this was in sharp contrast to Mr. Cantrell's "fortuitously remember[ing] when events took place and recall[ing] the 'real' meaning of documents when questioned by CleanTech's lawyers." J.A. 243. The District Court concluded that "[Mr.] Cantrell's testimony sounded carefully scripted rather than genuine and generally dismissive of the contemporaneous documentary evidence." J.A. 243. Accordingly, the District Court determined that it would "rel[y] primarily on the documents and testimony from other witnesses about the relationship between Agri-Energy and inventors during this period[.]" J.A. 243. "[We] give[] great deference to the district court's decisions regarding [the] credibility of witnesses." *Ecolochem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1378–79 (Fed. Cir. 2000) (internal quotation marks and citation omitted).

and syrup” for oil recovery testing using a centrifuge. J.A. 124.⁶

In June 2003, Mr. Barlage performed oil recovery tests on the Agri-Energy samples by heating each sample to a temperature of 176 °F and running them through an Alfa Laval centrifuge. J.A. 125. The syrup had a pH of “approximately 4” and a “moisture content between 70% and 80%.” J.A. 125. Based on the tests, Mr. Barlage concluded that it was easier to divest oil from syrup than from thin stillage. J.A. 125. In his report (“June 2003 Report”), Mr. Barlage concluded that “[s]omething in the evaporation process allows for the product to breakdown to a level where the oil can be taken out easily[,]” and recommended additional testing at a plant. J.A. 110092.

In early July 2003, Mr. Barlage traveled to Agri-Energy and tested VDT’s oil recovery system, including a centrifuge, with Agri-Energy’s ethanol syrup (“July 2003 Test”). J.A. 128–29. Again, the test included a syrup with a pH of around 4, with a moisture content between 70% and 80%, and the test was conducted at a temperature of 180 °F. J.A. 128–29. During the test, the centrifuge separated the oil from the syrup, but the centrifuge repeatedly clogged. J.A. 129. Around this time, Mr. Winsness directed a VDT employee to prepare a drawing of the ethanol oil recovery system, J.A. 130–31, which was completed by the end of July 2003, J.A. 132; *see* J.A. 110044 (Ethanol Oil Recovery System Diagram). The employee understood that the Ethanol Oil Recovery System Diagram “was intended to become a sales drawing.” J.A. 17278.

On August 1, 2003, Mr. Cantrell emailed several Agri-Energy employees (“August 2003 Email”) and attached a proposal, dated July 31, 2003. J.A. 132–33; *see*

⁶ Ethanol syrup is concentrated thin stillage. J.A. 124.

J.A. 110021–22 (“July 2003 Proposal”). The July 2003 Proposal stated that VDT “would like to offer Agri-Energy a No-Risk trial [of the] ‘Oil Recovery System.’” J.A. 110021. The proposal stated that “[t]he test module is designed to process 18,000 [pounds] per hour of evaporator condensate and recovers 16,000 [pounds] of oil per day adding annual profits of \$312,000 to \$530,000 per year.” J.A. 110021 (emphasis omitted). The proposal went on to detail the “No-Risk Trial,” which “allow[ed] Agri-Energy [sixty] days to operate the unit and confirm its value[,]” at which point Agri-Energy could “purchase the system” for \$423,000 or “return the skid to [VDT] (no questions asked).” J.A. 110021 (emphasis omitted). According to the Inventors, the purpose of the letter was to seek an opportunity to run in-plant tests and obtain data on how the test module ran. J.A. 31418–19. Agri-Energy understood the July 2003 Proposal as an offer for purchase. J.A. 248.

On August 18, 2003, Mr. Cantrell traveled to Agri-Energy and, the following day, presented his proposal to the Agri-Energy Board of Directors. J.A. 135. In the meeting, Mr. Cantrell described VDT’s ethanol extraction system as “a process where the corn oil is pulled off[,]” and he asserted that the system “worked” and that it “would generate additional income[.]” J.A. 135–36. On the same day, Mr. Winsness informed VDT shareholders that Mr. Cantrell was “meeting with an ethanol plant” and the Inventors “expect[ed] to have an order in the near future (\$400K).” J.A. 136. On August 27, 2003, Mr. Cantrell informed VDT’s chairman that “we have made an offer to Agri-Energy.” J.A. 136. Agri-Energy did not accept the July 2003 Proposal, and no centrifuge system was installed at Agri-Energy’s facility at that time. J.A. 137; *see* J.A. 70656 (Testimony by Mr. Cantrell) (stating that Agri-Energy did not accept the July 2003 Proposal). In early 2004, Agri-Energy and VDT again communicated regarding the installation of an oil recovery system, J.A. 137, and in May 2004, a centrifuge was installed in the Agri-Energy plant, J.A. 139.

B. Patent Prosecution History

In February 2004, the Inventors contacted attorney Andrew Dorisio about preparing a patent application for, inter alia, their method of separating corn oil from concentrated thin stillage using a centrifuge. J.A. 251–52. Specifically, the Inventors sought to patent a method whereby “[a]n evaporator would be used to concentrate thin stillage” to a syrup with “a moisture content between 60% and 85%,” and the syrup would then be mechanically processed to separate out the oil, using a disk stack centrifuge. J.A. 251. The temperature and pH of the thin stillage—150 °F to 212 °F and with a pH range from 3 to 6—would be the standard values of thin stillage in an ethanol plant. J.A. 251. Mr. Dorisio informed the Inventors about the on-sale bar of 35 U.S.C. § 102 (2000), which required that the claimed invention not be sold or offered for sale more than one year before the application filing date, and inquired if such an offer had been made. J.A. 252; *see* J.A. 111059; *see also* 35 U.S.C. § 102(b) (“A person shall be entitled to a patent unless . . . the invention was . . . on sale . . . more than one year prior to the date of the application for patent in the United States[.]”).⁷ Contemporaneous to their

⁷ Congress amended 35 U.S.C. § 102 when it passed the Leahy-Smith America Invents Act (“AIA”), and AIA § 4(e) made those changes applicable to “any patent application that is filed on or after” September 16, 2012. Pub. L. No. 112-29, § 4(e), 125 Stat. 284, 297 (2011). Because the application that led to the Patents-in-Suit was filed before September 16, 2012, pre-AIA § 102 applies. Under pre-AIA § 102, a person shall be entitled to a patent unless the claimed invention was on sale more than one year before the application’s filing date. 35 U.S.C. § 102(b). A patent is invalid under the on-sale bar if, before the filing date, the invention was both (1) the subject of a commercial

discussion with Mr. Dorisio, the Inventors also conducted research on the U.S. Patent and Trademark Office's ("USPTO") website, which included information about provisional patent applications and the on-sale bar. J.A. 252.

Subsequently, the Inventors provided Mr. Dorisio with test results from June 2003 and described the July 2003 Tests. J.A. 255. Mr. Dorisio, apparently without being told about the July 2003 Proposal or the Ethanol Oil Recovery System Diagram, filed U.S. Provisional Patent Application No. 60/602,050 ("the '050 provisional application") on August 17, 2004, with the USPTO, J.A. 140, 151; *see* J.A. 900, setting the critical date for the on-sale bar at August 17, 2003, J.A. 164. *See Helsinn Healthcare S.A. v. Teva Pharm. USA, Inc.*, 855 F.3d 1356, 1360 (Fed. Cir. 2017) ("The critical date for the on-sale bar is one year earlier[.]"), *aff'd*, 139 S. Ct. 628 (2019). In May 2005, Mr. Dorisio filed a non-provisional application, U.S. Patent Application No. 11/122,859 ("the '859 application"). The '859 application included a letter stating that a separate patent application, entitled "Substantially Fat Free Products From Whole Stillage Resulting from the Production of Ethanol from Oil-Bearing Agricultural Products," U.S. Patent Application No. 10/619,833 ("Prevost"), "may be found to claim the same invention as at least one claim of the instant application." J.A. 256 (internal quotation marks omitted).

In July 2005, Mr. Dorisio provided the Inventors with a draft clearance opinion, based on his understanding that the Inventors had reduced their claimed invention to practice in June 2003, and argued that the Inventors could swear behind Prevost, which was filed on July 15, 2003. J.A. 256; *see* J.A. 111060–74 (Draft Clearance Opinion); *see also* J.A. 111065 ("Past correspondence indicates [the] actual reduction to practice of the [claimed invention] during

sale or offer for sale and (2) "ready for patenting." *See Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 67 (1998).

experiments conducted in early to mid-June 2003. If accurate, this date of invention precedes the filing date of . . . [Prevost] by at least one month[.]”, 18286 (Prevost) (providing a filing date of July 15, 2003). In 2006, the Inventors joined CleanTech, J.A. 35686, which acquired VDT’s ethanol oil recovery method applications, J.A. 8–10.⁸

In March 2008, Mr. Winsness transferred the prosecution of CleanTech’s ethanol oil recovery method applications from Mr. Dorisio to the law firm Cantor Colburn LLP (“Cantor Colburn”). J.A. 257. An attorney at Cantor Colburn, Peter Hagerty, explained to at least one of the Inventors the on-sale bar and the Inventors’ obligation of candor toward the USPTO. J.A. 54666. In June 2008, a USPTO patent examiner rejected the ’859 application, based in part on Prevost. J.A. 258. Cantor Colburn amended the ’859 application’s claims. J.A. 258. By at least September 2008, Cantor Colburn was aware of Mr. Barlage’s testing in June and July 2003. J.A. 111075; *see* J.A. 111075 (Mr. Winsness’s Email to Mr. Hagerty) (explaining that the “testing we did in June 2003” showed that “a sequence of evaporation followed by centrifugation allows for oil recovery”).

In May 2009, a potential investor in CleanTech conducted due diligence and sought information on the company’s pending patent applications; specifically, the potential investor requested from the Inventors “pre-filing disclosures of the inventions” or “pre-filing offers for sale[.]” among other information. J.A. 261; *see* J.A. 111023. The Inventors denied having any such

⁸ The ’858 patent issued from the ’859 application, J.A. 900, and all the remaining patents of the Patents-in-Suit issued from applications that were continuations of the ’859 application, J.A. 910, 921, 953. The Patents-in-Suit claim effective filing dates of August 17, 2004. J.A. 900, 910, 921, 953.

information, although, in 2010, “Mr. Cantrell had retained a ‘signed version’ of the July 2003 Proposal in his ‘home files,’ and ‘an unsigned version was on [Mr.] Winsness’[s] computer[.]” J.A. 262; *see* J.A. 63882. In June 2009, Cantor Colburn withdrew the pending ’859 application from issue. J.A. 264; *see* J.A. 71338.

On the same day as the withdrawal, Cantor Colburn filed a letter with the USPTO in the ’859 application file disclosing that “[s]ometime in May 2004, feasibility testing of a process and system for recovering oil from thin stillage was performed[.]” J.A. 110380. The letter was also filed with the USPTO in the prosecution of the ’516, ’517, and ’484 patents. J.A. 264–65; *see* J.A. 110371–78, 110697–99. No reference was made to Mr. Barlage’s June and July 2003 testing, the June 2003 Report, the Ethanol Oil Recovery System Diagram, or the July 2003 Proposal. *See generally* J.A. 110371–74, 110375–78, 110379–81, 110697–99. In October 2009, the USPTO issued the ’858 patent. J.A. 900.

C. The Two Cantrell Declarations

In March 2010, Mr. Winsness provided a signed copy of the July 2003 Proposal to Cantor Colburn. J.A. 267; *see* J.A. 63882.⁹ Around June 2010, Mr. Hagerty drafted a

⁹ At trial, evidence showed that Mr. Winsness provided Cantor Colburn with two letters in March 2010: an ink-signed original dated July 31, 2003, and an ink signed original dated August 19, 2003. J.A. 63882. The two letters differed from the electronic versions sent by Mr. Cantrell to Agri-Energy, such as by presenting a different letterhead. J.A. 266–67. The parties presented evidence about when each letter was signed, but the District Court “[f]ound] the results of the experts’ analyses inconclusive with respect to the dating” of the two letters. J.A. 267. Additionally, the District Court concluded that “[i]f it had

two-page Information Disclosure Statement (“IDS”) to be submitted to the USPTO, attaching the July 2003 Proposal. J.A. 110793–95; *see* J.A. 270. In the IDS, Mr. Hagerty claimed that the ’858 patent’s method was “never disclosed, carried out, or performed” more than one year before the filing date and that the July 2003 Proposal was irrelevant. J.A. 110793–95.

In May and June 2010, Mr. Winsness met with a company that stated that it had reason to believe the ’858 patent, as well as the other Patents-in-Suit, were invalid due to an offer in violation of the on-sale bar. J.A. 268. In late June 2010, Mr. Winsness made an “unannounced” trip to Agri-Energy and offered to provide Agri-Energy with a royalty-free license for CleanTech’s ethanol oil recovery system, which Agri-Energy refused. J.A. 146–47. Agri-Energy’s maintenance manager testified that he felt that Mr. Winsness was offering “a royalty-free license in exchange for admitting the patent was valid.” J.A. 146. Mr. Winsness testified that he had offered a royalty-free system to Agri-Energy in 2004 and an “early adopter advantage” at an unspecified point in time. J.A. 269. Subsequently, in July 2010, Cantor Colburn attorney Michael Rye provided Agri-Energy with a letter, asking Agri-Energy to “confirm” certain facts, including that VDT had not provided Agri-Energy with drawings or diagrams “for the

not questioned [Mr.] Winsness’[s] veracity on other issues, the [District] Court could certainly conclude from this that [Mr.] Winsness has a propensity to evade the truth.” J.A. 266. For the purposes of our analysis, this point is ancillary—albeit concerning regarding the candor of counsel and their clients—to the significant fact that Mr. Cantrell provided Agri-Energy with a version of the July 2003 Proposal by email on August 1, 2003, a fact that is now not disputed. J.A. 155; *see* J.A. 110274 (Second Cantrell Declaration).

proposed system in 2003” and that the system proposed to Agri-Energy was for testing purposes. J.A. 147; *see* J.A. 110322–23. Agri-Energy refused to verify the assertions, as it believed most of them to be “untrue.” J.A. 148. Soon after, Mr. Cantrell claimed to Cantor Colburn that he hand-delivered the July 2003 Proposal to Agri-Energy on August 18, 2003, despite the letter bearing a date weeks earlier. J.A. 148; *see* J.A. 70601.

In November 2010, Cantor Colburn filed a declaration executed by Mr. Cantrell with the USPTO for the ’516 and ’517 patent applications and attached a copy of the July 2003 Proposal. The declaration explained that Mr. Cantrell had hand delivered the July 2003 Proposal to Agri-Energy on August 18, 2003. J.A. 148; *see* J.A. 110016–19 (First Cantrell Declaration). Cantor Colburn informed the USPTO that the July 2003 Proposal did not violate the on-sale bar, as it occurred less than a year before the application filing date. J.A. 148. Omitted from the disclosure was Mr. Barlage’s Test Report, the Ethanol Oil Recovery System Diagram, and Mr. Barlage’s June and July 2003 testing. *See generally* J.A. 110016–19. The USPTO issued the ’516 and ’517 patents on August 30, 2011. *See* J.A. 910, 921.

In September 2011, Mr. Cantrell was deposed regarding the infringement lawsuit of the instant case. J.A. 148; *see* J.A. 20185–249. Mr. Cantrell was shown the July 2003 Proposal emailed to Agri-Energy on August 1, 2003, and Mr. Cantrell testified that the email was not authentic. J.A. 278; *see* J.A. 20207–08. Mr. Cantrell later admitted that it was “possible” that he sent the August 1 email. J.A. 70601. Mr. Hagerty, when deposed in 2011, stated that “it sent a chill up his spine” when he learned that the letter was sent on August 1, 2003. J.A. 278. The parties, however, had stipulated during the March to August 2010 timeframe that Cantor Colburn was working under the impression that the July 2003 Proposal was sent on or near August 1, 2003. J.A. 278–79. Mr. Hagerty testified that he

was unconcerned about the July 2003 Proposal because it did not “disclose anything or amount to an offer.” J.A. 279.

In July 2012, Cantor Colburn withdrew the ’484 patent application, which also contained the First Cantrell Declaration, and filed a second declaration from Mr. Cantrell with the USPTO, which stated that Mr. Cantrell had forgotten about sending the August 2003 Email with the July 2003 Proposal attached. J.A. 155, *see* J.A. 110274 (Second Cantrell Declaration). Notably, the Second Cantrell Declaration did not provide any retractions of the false information provided in the First Cantrell Declaration—that it misstated that the first delivery of the July 2003 Proposal was on August 18, 2003—and did not explain the significance of the email in the Second Cantrell Declaration, which indicated a pre-critical date offer for sale. *See generally* J.A. 110274. In October 2012, the ’484 patent issued. J.A. 953.

III. Procedural History

Starting in 2009 and continuing through 2014, Clean-Tech filed lawsuits against the Appellees¹⁰ and Adkins

¹⁰ The Appellees are: Big River Resources Galva, LLC; Big River Resources West Burlington, LLC; Lincolnland Agri-Energy, LLC; Iroquois Bio-Energy Company, LLC; Cardinal Ethanol, LLC; Lincolnway Energy, LLC; ICM, Inc.; Bushmills Ethanol, Inc.; Al-Corn Clean Fuel, LLC; Chippewa Valley Ethanol Company, LLP; Heartland Corn Products; GEA Mechanical Equipment US, Inc., as Successor-in-Interest to GEA Westfalia Separator, Inc.; Ace Ethanol, LLC; Blue Flint Ethanol, LLC; United Wisconsin Grain Producers, LLC; Flottweg Separation Technologies, Inc.; Aemetis, Inc.; Aemetis Advanced Fuels Keyes, Inc.; Little Sioux Corn Processors, LLLP; Guardian Energy, LLC; Western New York Energy, LLC; Southwest Iowa Renewable Energy, LLC; Pacific Ethanol Magic

Energy, LLC (“Adkins”) for infringement of the Patents-in-Suit and CleanTech’s U.S. Patent No. 8,168,037 (“the ’037 patent”) in a number of actions that were subsequently combined into a multidistrict litigation case. In 2013, CleanTech moved for summary judgment. J.A. 1, 4–5. The Appellees and Adkins moved for, inter alia, summary judgment on invalidity. J.A. 3–5. The District Court found there was no infringement. J.A. 83, 86–87, 88, 90–91, 96. The District Court determined that specified claims in the lawsuit were invalid because of the on-sale bar, J.A. 174; anticipation, J.A. 181; obviousness, J.A. 192, 217; incorrect inventorship, J.A. 202; inadequate written description, J.A. 195; lack of enablement, J.A. 197, 219; and indefiniteness, J.A. 205.¹¹

Relevant here, the District Court determined that “undisputed contemporaneous evidence supports only one conclusion, the on-sale bar applies and invalidates the [Patents-in-Suit] because,” first, “the July [2003] Proposal was the culmination of a commercial offer for sale and,” second, “the method described in the [Patents-in-Suit] had either or both been reduced to practice or/and there was sufficient description of the patented method” by the critical date to allow for the implementation of the patent. J.A. 167.¹² The District Court explained that the July 2003

Valley LLC; Pacific Ethanol Stockton; Homeland Energy Solutions, LLC; Pacific Ethanol, Inc.; and David J. Vander Griend.

¹¹ Notably, the August 2003 Email and the accompanying July 2003 Proposal were not produced during discovery in the infringement litigation before the District Court. J.A. 134.

¹² The District Court initially determined that the on-sale bar did not apply to the ’484 patent, J.A. 174, but later clarified its ruling, explaining that independent claim 30 of the ’484 patent was invalid under the on-sale bar because

Proposal contained the “major elements of a contract for the sale of a system that could perform the patented method . . . : [namely] all items necessary to recover oil and the price.” J.A. 167. The District Court stated that the “dealing between the parties” leading up to the July 2003 Proposal evidences both parties’ understanding that it was an offer for sale. J.A. 168. The District Court relied upon the communications between VDT and Agri-Energy, as VDT had advised Agri-Energy about the system, how it would work, what it was comprised of, where it should be placed, what it would accomplish, and the cost of operation. J.A. 168–69. The District Court concluded that, under the Uniform Commercial Code (“UCC”), the signed proposal would have constituted a commercial contract. J.A. 169. Further, the District Court explained that other evidence regarding VDT and Agri-Energy’s contact surrounding the July 2003 Proposal corroborated its conclusion. J.A. 169–70 (referencing the creation of the Ethanol Oil Recovery System Diagram and Mr. Winsness’s announcement to shareholders that VDT had made an offer to sell and that the sale would lead to other sales). The District Court explained that a reasonable jury would not have concluded that the July 2003 Proposal was an offer to test its claimed invention as the Inventors knew the method could be successfully reduced to practice, J.A. 170–71 (listing evidence), and had been reduced to practice, J.A. 172 (citing Mr. Barlage’s two instances of practicing the method in 2003); *see* J.A. 172–73 (referencing other communications between the Inventors, Agri-Energy, and others implicating a reduction to practice). Accordingly, the District Court invalidated all of the claims of the ’859, ’516, and ’517 patents,

it required the same steps as the claims of the ’859, ’516, and ’517 patents that were also invalid, J.A. 234–35.

and independent claim 30 of the '484 patent pursuant to the on-sale bar.¹³

Following its summary judgment determinations, the District Court held an inequitable conduct bench trial.

¹³ In addition to the Patents-in-Suit, the District Court addressed the '037 patent, which was not included in the subsequent inequitable conduct bench trial. J.A. 237–38. The District Court determined that the '037 patent was obvious over Prevost and the Patents-in-Suit. J.A. 215–16; *see* J.A. 214 (explaining that it was undisputed that the Patents-in-Suit served as prior art to the '037 patent). Specifically, the District Court explained that Prevost and the Patents-in-Suit teach the oil recovery method for concentrated thin stillage, which is used with evaporators, as is disclosed by the '037 patent. J.A. 215–16. *Compare* '858 patent col. 5 ll. 28–30, *with* '037 patent col. 10 ll. 56–67. The District Court stated that a person having ordinary skill in the art (“PHOSITA”) would have been “familiar with the prior art ethanol plant processes,” like Prevost, that “includ[e] evaporation of thin stillage to reduce the moisture content before mixing it with wet distiller grains[.]” J.A. 215. The District Court explained that the Patents-in-Suit disclose dryer efficiencies that can be achieved from the removal of oil from syrup prior to any mixing with wet distiller grains. J.A. 215–16. *Compare* '858 patent col. 4 ll. 54–56, col. 5 ll. 28–30, *with* '037 patent col. 10 ll. 61–67. Because Prevost and the Patents-in-Suit disclose the drying of syrup after the oil extraction process but before it is added back to the dried distiller wet grains, we conclude that the District Court properly determined that a PHOSITA would have been motivated to lower the moisture content of the syrup, as disclosed in the '037 patent. *See Regents of Univ. of Cal. v. Broad Inst., Inc.*, 903 F.3d 1286, 1291 (Fed. Cir. 2018); *see also* 35 U.S.C. § 103(a).

J.A. 237. Following the bench trial, in which the Inventors and attorneys from Cantor Colburn testified, the District Court concluded that additional evidence at trial supported the District Court's previous determination that the Patents-in-Suit were ready for patenting when the Inventors provided the July 2003 Proposal to Agri-Energy. J.A. 294. The District Court concluded that CleanTech committed inequitable conduct through a "complete lack of regard for their duty to the [USPTO]." J.A. 261. Moreover, the District Court determined that "the [I]nventors made a mistake" by "offer[ing] their invention for sale to Agri-Energy" in "July/August 2003," and "[l]ater, they took affirmative steps to hide that fact from their lawyers, then, later [from] the [US]PTO when they learned that it would prevent them from profiting from the [Patents-in-Suit]." J.A. 299. The District Court stated that the Inventors "purposefully withheld the information about their dealings with Agri-Energy[.]" J.A. 263, and that they "acted to deceive the [US]PTO about the facts of the discovery process of the invention[.]" J.A. 261. In discussing the Inventors' "inten[t] to deceive the [US]PTO," the District Court stated that the conclusion was evidenced by the fact that the Inventors "allowed [Mr.] Hagerty to file the feasibility testing letter during prosecution of the [']858 patent, but [did] not tell the whole story about their 2003 successes and the [July 2003 Proposal]." J.A. 292. Moreover, "[w]ith respect to the [']516, the [']517, and the [']484 patents," the District Court determined that "the [I]nventors allowed [Mr.] Hagerty to file a false affidavit notwithstanding their knowledge that [Mr.] Barlage had practiced the method in June 2003 and they had made an offer to sell the method to Agri-Energy in July or early August of 2003." J.A. 292–93.

Additionally, the District Court concluded that Cantor Colburn either "purpose[fully] eva[ded]" disclosing or failed to seek out relevant information and so participated in the inequitable conduct, J.A. 264, "cho[o]s[ing] advocacy over candor[.]" J.A. 308. The District Court explained that Mr.

Hagerty “never asked the [I]nventors key questions about their invention or the meaning of contemporaneous documents and, after the litigation started, [Mr. Hagerty] relied on the litigation team to do all the investigation.” J.A. 296. The District Court stated that Cantor Colburn’s focus on “pre-critical date documents” “was purposefully and, in [the District] Court’s view improperly narrow.” J.A. 300 (internal quotation marks omitted). The District Court also found that “[i]n the face of [Mr.] Cantrell’s poor health, [Mr.] Winsness’[s] and Cantor Colburn’s reliance on [Mr.] Cantrell’s recollection of the events surrounding the [July 2003 Proposal] . . . , as well as their lackluster investigation of events is solid evidence of purposeful behavior.” J.A. 307. The District Court determined that Cantor Colburn “ignored the red flags [waving] before them[,]” such as the fact that Mr. Winsness “threatened Agri-Energy with legal action if it did not corroborate his and [Mr.] Cantrell’s story[,]” which Cantor Colburn supported by sending Agri-Energy a “thinly-veiled threat[.]” J.A. 307, 308.¹⁴ The District Court concluded that “[t]he only reasonable inference is that [Cantor Colburn] believed the [I]nventors had made an offer and, with the feasibility testing letter already before the [US]PTO in both

¹⁴ At the bench trial, Mr. Hagerty testified that he had learned about the Inventors’ interactions with Agri-Energy around September 2008, including, significantly, the occurrence of the July 2003 testing. J.A. 263. When asked why he failed to provide the potential CleanTech investor with that information, Mr. Hagerty “seemed perplexed that [the] request should have covered the 2003 testing because [Mr.] Hagerty had determined it was irrelevant to patentability.” J.A. 263. We conclude, as the District Court found, “[t]his conclusion is problematic in light of the fact that the written information [Mr.] Hagerty received from [Mr.] Winsness about the 2003 bench test stated that it worked[.]” J.A. 263.

prosecutions, . . . which implied a later reduction to practice date, they chose advocacy over candor.” J.A. 308. The District Court held the Patents-in-Suit unenforceable due to inequitable conduct. J.A. 313.

DISCUSSION

I. Standard of Review and Legal Standard

“Inequitable conduct is an equitable issue committed to the discretion of the trial court and is, therefore, reviewed by this court under an abuse of discretion standard.” *Energy Heating, LLC v. Heat On-The-Fly, LLC*, 889 F.3d 1291, 1299 (Fed. Cir. 2018) (citations omitted). We leave undisturbed the trial court’s inequitable conduct decision unless the appellant establishes “that the ruling is based upon clearly erroneous findings of fact or a misapplication or misinterpretation of applicable law or that the ruling evidences a clear error of judgment on the part of the [trial] court.” *Kingsdown Med. Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867, 876 (Fed. Cir. 1988) (citation omitted) (en banc in relevant part).

To prevail on a claim of inequitable conduct in a patent case, the accused infringer must prove by clear and convincing evidence that the patentee: (1) “knew of the reference” or prior commercial sale; (2) “knew that it was material”; and (3) “made a deliberate decision to withhold it.” *See Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1290 (Fed. Cir. 2011) (en banc). “Proving that the [patentee] knew of a reference, should have known of its materiality, and decided not to submit it to the [US]PTO does not prove specific intent to deceive.” *Id.* Instead, “the specific intent to deceive must be the single most reasonable inference able to be drawn from the evidence.” *Id.* (internal quotation marks and citation omitted).

The inequitable conduct claim here relates to whether the patentee failed to disclose information that would have implicated the on-sale bar under 35 U.S.C. § 102(b). A

patent is invalid under the on-sale bar if, before the critical date, the invention was: (1) the subject of a commercial sale or offer for sale; and (2) “ready for patenting.” *Pfaff*, 525 U.S. at 67. First, whether the claimed invention was the subject of an offer for sale is an inquiry based on “contract law principles.” *Linear Tech. Corp. v. Micrel, Inc.*, 275 F.3d 1040, 1048 (Fed. Cir. 2001). “It also involves an assessment of whether the circumstances surrounding the transaction show that the transaction was not primarily for purposes of experimentation.” *Allen Eng’g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1352–53 (Fed. Cir. 2002). “A use may be experimental only if it is designed to (1) test claimed features of the invention or (2) . . . determine whether an invention will work for its intended purpose[.]” *Clock Spring, L.P. v. Wrapmaster, Inc.*, 560 F.3d 1317, 1327 (Fed. Cir. 2009) (involving a question of public use and not the on-sale bar but stating that “[t]hough a prior commercial sale and not a prior public use was at issue in *Allen Engineering*, the factors explicated are equally relevant to an analysis of experimental use”). To determine if a transaction was conducted primarily to experiment, a district court may look to the *Allen* factors to assess the transaction’s experimental nature. *See Allen Eng’g*, 299 F.3d at 1352–53. These factors include: “(1) the necessity for public testing, . . . (3) the nature of the invention, [and] . . . (10) whether the invention reasonably requires evaluation under actual conditions of use[.]” *Id.* (citation omitted). If a prior commercial sale was primarily for purposes of experimentation, the sale will not serve as a bar. *See Clock Spring*, 560 F.3d at 1327. “In making this patentability determination, the [trial] court should apply the preponderance of the evidence standard[.]” *Therasense*, 649 F.3d at 1291–92.

Second, “[a]n invention is ‘ready for patenting’ when prior to the critical date: (1) the invention is *reduced to practice*; or (2) the invention is *depicted in drawings or described in writings* of sufficient nature to enable a

[PHOSITA] to practice the invention.” *Hamilton Beach Brands, Inc. v. Sunbeam Prods.*, 726 F.3d 1370, 1375 (Fed. Cir. 2013) (citation omitted) (emphases added).

II. The District Court Did Not Abuse Its Discretion in Determining that the Patents-in-Suit Are Unenforceable Due to Inequitable Conduct¹⁵

After a bench trial, the District Court concluded that CleanTech and its attorneys at Cantor Colburn engaged in

¹⁵ Despite CleanTech’s arguments to the contrary, *see* Appellant’s Reply Br. 4, we will address the issue of inequitable conduct without first conducting a de novo review of the District Court’s summary judgment on-sale bar determination. A finding of a reference’s or prior sale’s materiality is required for an inequitable conduct determination, *see Therasense*, 649 F.3d at 1290, which is reviewed for abuse of discretion, *see Energy Heating*, 889 F.3d at 1299. CleanTech contends that materiality may not be reviewed in the context of the inequitable conduct claim, as materiality was not properly raised before and addressed by the District Court during the inequitable conduct bench trial. Appellant’s Reply Br. 4–5. This argument is jejune. The District Court held an eight-day bench trial in which materiality was squarely before it. In addition to incorporating the evidence and findings of materiality that had been presented at the summary judgment stage, J.A. 237, the District Court admitted other relevant evidence during the trial, including documents relating to the June and July 2003 testing, J.A. 40144–45, 40153–54, and previously unheard testimony from the Inventors and attorneys with Cantor Colburn, J.A. 294, all relating to the materiality of the July 2003 Proposal. Moreover, following the bench trial, the District Court determined that “its conclusion [from the Summary Judgment Order] that [the July 2003 Proposal] evidence both elements of the on-sale bar” was “confirm[ed]” and, after incorporating “by

inequitable conduct in obtaining the Patents-in-Suit, rendering the patents unenforceable. J.A. 313. On appeal, CleanTech argues that the District Court made clearly erroneous findings of fact and misapplied the law with respect to its on-sale bar determination, as well as its conclusions regarding the parties' knowledge of materiality and their intent to deceive. Appellant's Br. 104, 109–10. We disagree with CleanTech.

A. On-Sale Bar

The District Court “conclude[d] that the undisputed contemporaneous evidence supports only one conclusion, [that] the on-sale bar applies and invalidates the [Patents-in-Suit] because” the claimed invention was the subject of an offer for commercial sale and it was ready for patenting. J.A. 167. We address each determination in turn.

1. The District Court Did Not Abuse Its Discretion in Determining the Claimed Invention Was the Subject of a Pre-Critical Date Offer for Sale

The District Court concluded that the July 2003 Proposal constituted a pre-critical-date offer for sale. J.A. 299.

reference the findings of fact and conclusions of law in the Summary Judgment Order,” the District Court determined that “[f]urther evidence at trial only buttressed the [District] Court’s earlier conclusion, particularly with respect to the ready for patenting element of the on-sale bar.” J.A. 294. Additionally, despite CleanTech’s suggestions to the contrary, *see* Appellant’s Br. 105, inequitable conduct’s materiality requirement does not provide the patentee with the right to a jury and instead must be resolved by the trial court, *see Am. Calcar, Inc. v. Am. Honda Motor Co., Inc.*, 651 F.3d 1318, 1333 (Fed. Cir. 2011) (“Inequitable conduct is equitable in nature, with no right to a jury, and the trial court has the obligation to resolve the underlying facts of materiality and intent.”).

CleanTech contends that it was not an offer as it “did not in fact perform the method for Agri-Energy, before the critical date, for a promise of future compensation.” Appellant’s Br. 37 (internal quotation marks and emphasis omitted) (citing *Plumtree Software, Inc. v. Datamize, LLC*, 473 F.3d 1152, 1162–63 (Fed. Cir. 2006)). We disagree with CleanTech.

The District Court did not abuse its discretion in determining that the claimed invention was the subject of an offer for sale in the summer of 2003. First, relying on the UCC, the District Court concluded that the July 2003 Proposal was a “sale on approval” that was made before the critical date. J.A. 169 (citing U.C.C. § 2-326); see U.C.C. § 2-326(1)(a) (“[I]f delivered goods may be returned by the buyer even though they conform to the contract, the transaction is . . . a ‘sale on approval’ if the goods are delivered primarily for use[.]”); see also *Linear*, 275 F.3d at 1052 (explaining “that the [UCC] should inform the [district court’s] analysis of the contractual issues[.]” such as the on-sale bar). The July 2003 Proposal provides an offer of “all items necessary to recover oil and the price,” J.A. 167, and the Inventors understood the offer to Agri-Energy was a “first sale” that would lead to additional sales, J.A. 170–72. Accordingly, the District Court properly concluded that the July 2003 Proposal was an “offer for sale.” *Pfaff*, 525 U.S. at 67.

CleanTech’s primary counterargument is unavailing. CleanTech contends that the District Court misconstrued the law by failing to apply *Plumtree*’s requirement that the “challenger must prove that the patentee either: (i) ‘made a commercial offer to perform the patented method[.]’; or (ii) ‘in fact performed the patented method for a promise of future compensation.’” Appellant’s Br. 36. CleanTech, however, did not make this argument before the District Court and cited to *Plumtree* only once in its summary judgment opposition and only for the proposition that the July 2003 Proposal was not invalidating because it “did not

unambiguously require use of [CleanTech’s] patented methods[.]” J.A. 26364 (*citing Plumtree*, 473 F.3d at 1163). Because we apply the law of the regional circuit as to procedural matters, *see Info-Hold, Inc. v. Muzak LLC*, 783 F.3d 1365, 1371 (Fed. Cir. 2015), here the Seventh Circuit, we will not decide an issue for the first time on appeal, *see Scheurer v. Fromm Family Foods LLC*, 863 F.3d 748, 755 (7th Cir. 2017) (“The well-established rule in th[e Seventh] Circuit is that a plaintiff waives the right to argue an issue on appeal if she fails to raise the issue before a lower court.” (internal quotation marks and citation omitted)).

2. The District Court Did Not Abuse Its Discretion in Determining the Claimed Invention Was Ready for Patenting Before the Critical Date

The District Court determined that the claimed invention was ready for patenting prior to the critical date. J.A. 167. CleanTech contends that the District Court failed to find that the claimed invention was reduced to practice “on a claim-by-claim basis” for each of the Patents-in-Suit. Appellant’s Br. 46. We disagree with CleanTech.

The District Court did not abuse its discretion in determining the claimed invention was ready for patenting in June or July 2003. First, with respect to the reduction to practice, the District Court relied upon the two tests conducted by Mr. Barlage in the summer of 2003 to support its determination. J.A. 126–27; *see Hamilton Beach Brands*, 726 F.3d at 1375 (“An invention is ‘ready for patenting’ when prior to the critical date: . . . the invention is *reduced to practice*[.]” (emphasis added) (citation omitted)). The District Court explained that, in June 2003, Mr. Barlage tested an ethanol syrup with a pH, moisture content, and temperature within the claimed ranges recited in the Patents-in-Suit, *compare* J.A. 125–26 (describing Mr. Barlage’s testing, which heated thin stillage to a temperature of 176 °F, with a pH of “approximately 4, and moisture content between 70% and 80%”), *with* J.A. 920 (516 patent)

(Dependent Claim 6) (reciting “[a] method of recovering oil from thin stillage” with a temperature between 150 °F and 212 °F, a pH between 3 and 6, and a moisture content of greater than 30% and less than 90% by weight), and separated oil from the syrup with a centrifuge, reporting that “the oil can be taken out easily,” J.A. 125–26, 171. Indeed, the Inventors themselves made statements contemporaneous to the June and July 2003 testing that the claimed invention was reduced to practice. J.A. 127 (Mr. Cantrell stating to Agri-Energy following the July 2003 Test that “[t]he technology is available to remove the oil, and the quick payback from the new revenue stream, make this a very viable program”), 111065 (Mr. Dorisio’s Draft Clearance Opinion to the Inventors) (“Past correspondence indicates *your actual reduction to practice* of the removing oil from syrup aspect of the proposed invention *during experiments conducted in early to mid-June 2003.*” (emphases added)). Moreover, immediately following the July 2003 Test, Mr. Winsness then directed a VDT employee to prepare the Ethanol Oil Recovery System Diagram, J.A. 130–32; see J.A. 110044 (Ethanol Oil Recovery System Diagram), which the employee understood “was intended to become a sales drawing[.]” J.A. 132 (internal quotation marks omitted); see J.A. 246 (the VDT employee “understood that the drawings would be used for sales purposes by [Mr.] Cantrell and [Mr.] Winsness”). The District Court, after reviewing the evidence, did not abuse its discretion in determining that “the method of the patented invention . . . had been performed” during June and July 2003. J.A. 171.

CleanTech’s counterarguments are meritless and misleading. CleanTech disputes the District Court’s determination that the June and July 2003 testing was not experimental, arguing that there were “genuine factual disputes on [its] ‘commercial’ v[ersus] ‘experimental’” nature. Appellant’s Br. 39 (capitalization modified). Specifically, CleanTech argues that “nearly all” of the *Allen*

factors support the experimental nature of the July 2003 Proposal. *Id.* at 40. As an initial matter, CleanTech misrepresents the *Allen* factors and supports its arguments with testimony that was discredited by the District Court. *Compare id.* (“*Allen* factors [one] and [ten] ask whether the inventors ‘needed’ to experiment with the invention ‘under actual conditions of use.’” (internal brackets and emphasis omitted)), *with Allen Eng’g*, 299 F.3d at 1353 (explaining that factor one assesses whether there is “the necessity for public testing” and factor ten addresses “whether the invention reasonably requires evaluation under actual conditions of use”). CleanTech argues its testing was experimental because its claimed invention “clearly” “‘needed’ to experiment with the invention ‘under actual conditions of use.’” Appellant’s Br. 40 (quoting *Allen Eng’g*, 299 F.3d at 1353) (internal brackets omitted). The District Court did not abuse its discretion in discounting this argument, as it explained that a “reduction to practice does not require a showing that the method would work acceptably in a plant environment, unless the claims require it, and the claims here do not.” J.A. 172 (internal quotation marks and citation omitted); *see In re Cygnus Telecomms. Tech., LLC*, 536 F.3d 1343, 1355 (Fed. Cir. 2008) (explaining that a system that would not have worked on a “commercial scale[,]” but that “embodied the claims” of the “patents at issue[,]” satisfied the “‘ready for patenting’ prong” of the on-sale bar). The District Court considered the *Allen* factors and concluded that the offer to Agri-Energy was an offer for sale and not for purposes of experimentation. J.A. 167; *see Allen Eng’g*, 299 F.3d at 1352–53. For these reasons, we conclude that the District Court did not clearly err in its determination.

Second, the District Court found the claimed invention was ready for patenting because it had been depicted and described in such a way that a PHOSITA would be able to practice it. J.A. 172–73; *see Hamilton Beach Brands*, 726 F.3d at 1375 (“An invention is ‘ready for patenting’ when

prior to the critical date . . . the *invention is depicted in drawings or described in writings* of sufficient nature to enable a [PHOSITA] to practice the invention.” (emphasis added) (citation omitted)). Despite CleanTech’s argument that its expert opined the Inventors had not prepared drawings or other descriptions of the invention that were sufficiently specific to enable a PHOSITA to practice it, *see* Appellant’s Reply Br. 18 (emphasis omitted), Appellant’s Br. 47, the District Court determined that, while there was no “single reference that specifically delineate[d]” the method “disclosed by the [Patents-in-Suit], the Ethanol [Oil Recovery] System Diagram” in combination “with [Mr.] Barlage’s lab tests and results” and “communications from [Mr.] Cantrell to Agri-Energy . . . would allow a [PHOSITA] to practice the invention of the [Patents-in-Suit,]” J.A. 173. The District Court explained that “[t]here is no mystery or dispute that the pH, moisture content[,] and temperature ranges in the claims of the [Patents-in-Suit] are those that occur at the standard operating conditions of a dry mill ethanol plant.” J.A. 173. CleanTech has not shown clear error in these factual findings and we reject the invitation to reweigh the evidence. Accordingly, the District Court did not abuse its discretion in its on-sale bar determination.

B. The District Court Did Not Abuse Its Discretion in Concluding that CleanTech and Its Lawyers Made a Deliberate Decision to Withhold Material Information with the Specific Intent to Deceive the USPTO

The District Court concluded that CleanTech knew of the claimed invention’s offer for sale and reduction to practice in the summer of 2003, as well as that information’s materiality. J.A. 303, 308. The District Court “conclude[d] that the [I]nventors and the[ir] attorneys intentionally withheld material information from the [US]PTO during prosecution” of the Patents-in-Suit, thereby rendering the Patents-in-Suit unenforceable due to inequitable conduct. J.A. 312; *see Therasense*, 649 F.3d at 1290 (explaining that

inequitable conduct requires a showing of clear and convincing evidence that the patentee “knew of the reference, knew that it was material, and made a deliberate decision to withhold it”). CleanTech contends that that District Court erred in its materiality and intent to deceive findings. Appellant’s Br. 104–05. We disagree with CleanTech.

The District Court did not abuse its discretion in rendering unenforceable the Patents-in-Suit for inequitable conduct. For the reasons discussed above, *see supra* Section II.A, we conclude that the District Court did not abuse its discretion in concluding that CleanTech and its attorneys were aware that the claimed invention was ready for patenting, as evidenced by documents belatedly or not turned over to the USPTO, and that they knew of those documents’ materiality. In addition to knowledge and materiality, inequitable conduct requires a clear and convincing showing that CleanTech “made a deliberate decision to withhold” the material information. *See Therasense*, 649 F.3d at 1290. Moreover, “the specific intent to deceive must be ‘the single most reasonable inference drawn from the evidence.’” *Id.* Here, the District Court did not abuse its discretion in determining for numerous reasons that CleanTech deliberately withheld material information.

First, the District Court concluded that CleanTech knew the July 2003 Proposal to Agri-Energy threatened its chances of patenting its ethanol oil recovery method. J.A. 299 (explaining “that the [I]nventors made a mistake in July/August 2003 and offered their invention for sale to Agri-Energy” and “[I]ater . . . took affirmative steps to hide that fact from their lawyers, then, later the [US]PTO when they learned that it would prevent them from profiting from the patents”). This determination is supported by the record. In February 2004, the Inventors sought information from the USPTO website about provisional patent applications and the on-sale bar. J.A. 252. Days later, Mr. Dorisio informed the Inventors about the on-sale bar.

J.A. 252. The District Court did not clearly err in finding that CleanTech was aware of the on-sale bar and its requirements. *See Energy Heating*, 889 F.3d at 1302–03 (concluding that the district court did not abuse its discretion in finding an inventor’s knowledge that sales of the claimed invention prior to the critical date were material, and the inventor’s failure to disclose the sales was intended to deceive the USPTO).

Second, the District Court found that the Inventors and the attorneys at Cantor Colburn withheld evidence of successful testing in 2003 and made false representations by implying that the invention was not reduced to practice until 2004. J.A. 302 (“[N]ot providing information regarding the [I]nventors’ dealings with Agri-Energy or [Mr.] Barlage[s] bench-top test raises an inference that the patentees intended to deceive the [US]PTO—it was pre-critical date information that had a direct bearing on the ability of the [I]nventors to prove that their claims were patentable.”). This finding is supported by the record. Cantor Colburn began representing CleanTech in March 2008 and, by at least September 2008, were aware of Mr. Barlage’s testing in June and July 2003. J.A. 111075. Mr. Winsness informed Cantor Colburn that the “testing we did in June 2003” showed that “a sequence of evaporation followed by centrifugation allows for oil recovery[.]” J.A. 111075. Moreover, the Inventors informed Cantor Colburn that, based on the summer 2003 testing, the Inventors “believe[d] [that] the process would work on a commercial scale.” J.A. 263 (internal quotation marks omitted). Cantor Colburn was also in possession of the Ethanol Oil Recovery System Diagram and the test reports themselves. J.A. 301. Despite possessing this information, Cantor Colburn did not provide it to the USPTO during the prosecution of the Patents-in-Suit and referenced it only to assert that the claimed invention predated Prevost. J.A. 301–02, 304–06, 309. Moreover, in June 2009, Cantor Colburn filed a letter with the USPTO stating that

feasibility testing occurred in May 2004, with no mention of the documents dated a year earlier. J.A. 303. This letter was filed in the prosecutions of each of the Patents-in-Suit. J.A. 304–05. The District Court did not clearly err in its finding that CleanTech and Cantor Colburn withheld material evidence from the USPTO. *See Molins PLC v. Textron, Inc.*, 48 F.3d 1172, 1178 (Fed. Cir. 1995) (“[Patentees] who are not ‘up front’ with the [US]PTO run the risk that, years later, a fact-finder might conclude they intended to deceive. This is what appears to have happened here and we must affirm the trial court.”); *see also id.* (“Applicants for patents are required to prosecute patent applications in the [US]PTO with candor, good faith, and honesty. . . . This duty extends also to the applicant’s representatives.” (internal footnote and citations omitted)).

Third, the District Court determined that CleanTech and Cantor Colburn “threatened” Agri-Energy to coerce its support regarding the critical date for the Patents-in-Suit, after the July 2003 Proposal surfaced and during the pendency of the ’516 and ’517 patents. J.A. 308. Specifically, in June 2009, Mr. Winsness traveled to Agri-Energy and “offered Agri-Energy a royalty-free license in exchange for Agri-Energy’s willingness to admit that the pending patents were valid.” J.A. 269. In July 2009, Cantor Colburn sent Agri-Energy an email offering “a release of liability for any prior use of an extraction system” and indemnification “against any liability” in return “for cooperating with [CleanTech] and for clarifying the use of the corn oil system in 2004.” J.A. 110322. Moreover, Cantor Colburn requested a statement “confirming and clarifying” certain facts relating to the offer. J.A. 110322–23. Agri-Energy’s manager testified that he “did not accept the offer from [Cantor Colburn and CleanTech] because the statements were not true.” J.A. 271. Notably, Cantor Colburn “failed to request that Agri-Energy provide any documents” regarding its interactions with the Inventors. J.A. 271. The District Court did not abuse its discretion in concluding

that these attempts to threaten Agri-Energy spoke to CleanTech's and Cantor Colburn's intent to deceive the USPTO.

Fourth, the District Court concluded that the Inventors and Cantor Colburn made a "patently false" statement in the First Cantrell Declaration, by claiming the July 2003 Proposal was delivered to Agri-Energy after the critical date. J.A. 276; see J.A. 307 ("[T]he [I]nventors and attorneys misrepresented to the [US]PTO that the [July 2003 Proposal] was immaterial by filing the false [First] Cantrell . . . Declaration[.]"). The District Court's determination that the declaration was false is supported by the evidence. Specifically, it was not until August 2010 that Mr. Cantrell told Cantor Colburn that he recalled he had personally delivered the July 2003 Proposal to Agri-Energy on August 18, 2003. J.A. 272. The attorneys at Cantor Colburn testified that they themselves were skeptical of the veracity of the claim, as the date specified by Mr. Cantrell would alleviate all concerns about the on-sale bar. J.A. 272–73. Nonetheless, Cantor Colburn filed the First Cantrell Declaration in November 2010 for the '516 and '517 patent prosecutions, J.A. 276–77, and in the '484 patent prosecution in July 2011, J.A. 277. This was done notwithstanding the Inventors' knowledge that Mr. Barlage had practiced the claimed method in June 2003 and they had offered to sell the claimed invention to Agri-Energy in July or early August of 2003. J.A. 292–93; see *Rohm & Haas Co. v. Crystal Chem. Co.*, 722 F.2d 1556, 1571 (Fed. Cir. 1983) ("[T]here is no room to argue that submission of false affidavits is not material."). Moreover, prior to Mr. Cantrell's August 2010 statement, Cantor Colburn had prepared a detailed disclosure that included information about the June and July 2003 Tests and Report and the Ethanol Oil Recovery System Diagram, which the law firm had possessed since September 2008. J.A. 308; see J.A. 111075–104 (Email from Mr. Winsness to Mr. Hagerty Dated September 2008) (providing "some history of testing

we did in June 2003 to discover that a sequence of evaporation followed by centrifugation allows for oil recovery[.]” including the June 2003 Report). Following Mr. Cantrell’s statements, the disclosure was discarded and never filed in any patent prosecution. J.A. 308. Based on this, the District Court concluded that “[t]he *only reasonable inference* is that [Cantor Colburn] believed the [I]nventors had made an offer and, with the feasibility testing letter already before the [US]PTO in both prosecutions, . . . which implied a later reduction to practice date, *they chose advocacy over candor.*” J.A. 308 (emphases added). The District Court did not abuse its discretion in concluding that the “patently false” statement in the First Cantrell Declaration was material and supported its intent to deceive determination.

Fifth, the District Court explained that the Inventors’ and Cantor Colburn’s failure to correct the false declaration in the ’484 patent prosecution was “strong evidence of intentional deceit[.]” J.A. 309. Specifically, at Mr. Cantrell’s September 2011 deposition, where Mr. Cantrell and Cantor Colburn “*kn[e]w for certain* that [Mr.] Cantrell’s First Declaration [was] false,” no correction was made then or during the following eight months. J.A. 309 (emphasis added); *see* J.A. 280 (“Most disturbing is that, during this period, neither litigation counsel nor [Mr.] Hagerty did anything to alert the [US]PTO that [Mr.] Cantrell’s First Declaration was false[.]”). In July 2012, the Second Cantrell Declaration was filed with the USPTO, in which Mr. Cantrell attested that “[a]ttached is an e-mail sent from my e-mail account on August 1, 2003” and that “[t]he [July 2003 Proposal] attached to the August 1 email was unsigned.” J.A. 110274. As the District Court explained, the Second Cantrell Declaration provided “the false impressions that [Mr.] Cantrell may not have sent the [August 2003 Email] and that the unsigned letter had less significance than the ‘signed’ one he allegedly hand delivered later the same month,” it “repeats false information,” and “fails to distinctly point out and/or explain the false

information previously provided to the examiner[.]” J.A. 283. Based on this evidence, we conclude that the District Court did not abuse its discretion in concluding that, by clear and convincing evidence, the single most reasonable inference to be drawn from the record was that the Inventors and Cantor Colburn intended to deceive the USPTO. *See Energy Heating*, 889 F.3d at 1302–03.

CleanTech raises numerous counterarguments, all of which are unavailing. First, CleanTech argues that the District Court’s review of materiality “exceeded the scope of the bench trial, which was only on ‘inequitable conduct.’” Appellant’s Br. 105. Materiality is, however, an element of the inequitable conduct claim and was squarely before the District Court. *See Therasense*, 649 F.3d at 1290 (“In a case involving nondisclosure of information, clear and convincing evidence must show that the applicant made a deliberate decision to withhold *a known material reference*.” (internal quotation marks and citation omitted) (emphasis altered)). In fact, CleanTech itself raised materiality in pre-trial briefing, contending that the Appellants “will also not be able to establish that any of the alleged errors and omissions, aside from the misstatements found in [Mr.] Cantrell’s first declaration, would have been ‘but-for’ material.” J.A. 63467. Accordingly, the District Court did not err in making a materiality determination.

Second, CleanTech avers that the District Court’s materiality finding violated its right to a jury trial. Appellant’s Br. 105. Given that inequitable conduct is based in equity, there is no right to a jury trial. *See Am. Calcar*, 651 F.3d at 1333 (“Inequitable conduct is equitable in nature, with no right to a jury, and the trial court has the obligation to resolve the underlying facts of materiality and intent.”).

Third, CleanTech contends that the District Court “barred CleanTech from re-litigating materiality” by excluding some evidence involving the USPTO’s actions

permitting “a continuation in the [Patents-in-Suit]” even after the USPTO was provided with evidence of the July 2003 Proposal and related materials. Appellant’s Br. 105–06. The evidence was excluded under Federal Rule of Evidence 403, because the District Court determined that its probative value was outweighed by the likelihood that it would confuse and prolong the trial. J.A. 71952–53; *see* Fed. R. Evid. 403 (“The court may exclude relevant evidence if its probative value is substantially outweighed by a danger of one or more of the following: unfair prejudice, confusing the issues, . . . undue delay, [or] wasting time[.]”). To the extent that CleanTech is contesting the Rule 403 determination, it did not do so before the District Court and so waives the issue here. *See Scheurer*, 863 F.3d at 755. Accordingly, the District Court did not abuse its discretion in reaching its inequitable conduct determination.¹⁶

CONCLUSION

We have considered the parties’ other arguments and each of the remaining issues raised on appeal and cross-appeal and find them to be without merit. Accordingly, the judgments below are

AFFIRMED

¹⁶ As we affirm the District Court’s determination that the Patents-in-Suit are unenforceable due to the inequitable conduct, we need not address CleanTech’s additional arguments regarding the other grounds upon which the District Court ruled the Patents-in-Suit invalid. *See Energy Heating*, 889 F.3d at 1308 (concluding that, where a trial court’s judgment that a “patent is unenforceable for inequitable conduct” is affirmed, this court need “not reach the [trial] court’s summary judgment of obviousness, claim construction order, or summary judgment of no direct infringement”).

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COSTS

Costs to the Appellees and Cross-Appellant.