

NOTE: This disposition is nonprecedential.

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

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**EXERGEN CORPORATION,**  
*Plaintiff-Cross-Appellant*

v.

**KAZ USA, INC.,**  
*Defendant-Appellant*

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2016-2315, 2016-2341

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Appeals from the United States District Court for the District of Massachusetts in No. 1:13-cv-10628-RGS, Judge Richard G. Stearns.

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Decided: March 8, 2018

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KERRY L. TIMBERS, Sunstein Kann Murphy & Timbers LLP, Boston, MA, argued for plaintiff-cross-appellant. Also represented by ROBERT M. ASHER, JOEL R. LEEMAN, BRANDON TAYLOR SCRUGGS, SHARONA STERNBERG.

PRATIK A. SHAH, Akin, Gump, Strauss, Hauer & Feld, LLP, Washington, DC, argued for defendant-appellant. Also represented by ZE-WEN JULIUS CHEN, JAMES EDWARD TYSSE; DANIEL LYNN MOFFETT, KIRT S. O'NEILL, San Antonio, TX.

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Before MOORE, BRYSON, and HUGHES, *Circuit Judges*.

Opinion for the court filed by *Circuit Judge* MOORE.

Dissenting opinion filed by *Circuit Judge* HUGHES.

MOORE, *Circuit Judge*.

Kaz USA, Inc. (“Kaz”) appeals the United States District Court for the District of Massachusetts decision holding claims 7, 14, and 17 of U.S. Patent No. 6,292,685 (“’685 patent”) and claims 17, 24, 33, 39, 40, 46, 49, 60, and 66 of U.S. Patent No. 7,787,938 (“’938 patent”) directed to patent eligible subject matter. Kaz also appeals the district court’s denial of judgment as matter of law on noninfringement of the ’685 patent and denial of a new trial on damages. Exergen Corp. (“Exergen”) cross-appeals the district court’s summary judgment of no willful infringement. For the reasons discussed below, we affirm-in-part, reverse-in-part, vacate-in-part, and remand for further proceedings.

#### BACKGROUND

The ’685 and ’938 patents disclose a body temperature detector that calculates a person’s core temperature by detecting the temperature of the forehead directly above the superficial temporal artery. ’685 patent<sup>1</sup> at 2:10–14. A person’s core temperature can be computed by applying a constant coefficient to the skin and ambient temperature readings. *Id.* at 3:8–16. The patents explain that the superficial temporal artery is ideal for taking temperature due to its accessibility, stable blood flow, and temperature close to that of the heart. *Id.* at 3:63–4:8. They teach to

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<sup>1</sup> The specifications of the ’685 and ’938 patents are effectively identical. Unless otherwise specified, citations to the ’685 patent refer to both patents.

“locate the temporal artery, a temperature sensor, preferably a radiation detector 20, is scanned across the side of the forehead over the temporal artery while electronics in the detector search for the peak reading which indicates the temporal artery.” *Id.* at 4:9–13. The patents further explain that prior art temperature detectors did not “provide the unique combination of elements which enable consistent measurements of core temperature by scanning across a superficial artery.” *Id.* at 8:54–60. For example, prior art detectors were not adapted to scan across a target surface by taking multiple samples per second or were based on a pivoting scan rather than a lateral scan. *Id.* at 8:60–9:8.

The claims at issue include both apparatus claims and method claims. Claim 49 which depends from claim 48 of the ’685 patent, an apparatus claim, recites:

48. A body temperature detector comprising:

a radiation detector; and

electronics that measure radiation from at least three readings per second of the radiation detector as a target skin surface over an artery is viewed, the artery having a relatively constant blood flow, and that process the measured radiation to provide a body temperature approximation, distinct from skin surface temperature, based on detected radiation.

49. The body temperature detector of claim 48 wherein the artery is a temporal artery.

Claim 24, which depends from claim 14, of the '938 patent, a method claim, recites<sup>2</sup>:

14. A method of detecting human body temperature comprising making at least three radiation readings per second while moving a radiation detector to scan across a region of skin over an artery to electronically determine a body temperature approximation, distinct from skin surface temperature.

24. The method of claim 14 wherein the artery is a temporal artery.

Exergen sued Kaz and two other competitors, Brooklands Inc. and Thermomedics Inc., in the District of Massachusetts, and the three suits proceeded separately with different judges. The parties and judges involved agreed to consolidate claim construction for the three cases, but all other matters were resolved separately. In the *Brooklands* suit, the district court held claims 51 and 54 of the '938 patent ineligible under 35 U.S.C. § 101. *Exergen Corp. v. Brooklands Inc.*, 125 F. Supp. 3d 307, 312–17 (D. Mass. 2015). In the *Thermomedics* suit, the district court held claims 51, 52, 54, and 55 of the '938 patent ineligible under § 101. *Exergen Corp. v. Thermomedics, Inc.*, 132 F. Supp. 3d 200, 203–08 (D. Mass. 2015), *aff'd sub nom. Exergen Corp. v. Sanomedics Int'l Holdings, Inc.*, 653 F. App'x 760 (Fed. Cir. 2016).

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<sup>2</sup> Appellant argues that method claim 14 is representative of the claims at issue on appeal. Appellant's Corrected Principal Br. 6. Appellee argues the twelve claims at issue separately grouping them by their common limitations. *See, e.g.*, Cross Appellant's Principal & Resp. Br. 12–13, 37–47.

Kaz moved for summary judgment, asserting that the *Thermomedics* judgment had preclusive effect. The district court denied Kaz's motion with respect to the claims currently on appeal. The district court also granted Kaz's pre-trial motion for summary judgment of no willful infringement.

After trial, the jury found all asserted claims infringed and not invalid and awarded Exergen \$9,802,228 in lost profits and \$4,840,320 in reasonable royalties. No factual or legal issues regarding patent eligibility under § 101 were submitted to the jury.

After post-trial briefing, the district court, with the benefit of the evidence presented at trial and "[g]uided by the jury's verdict, and by the pleadings specific to this case," denied judgment of invalidity under § 101, J.A. 105. It also summarily denied Kaz's motions for judgment as a matter of law with respect to noninfringement and for a new trial on damages. Kaz appeals the district court's denial of its motions with respect to § 101, noninfringement, and damages. Exergen cross-appeals the district court's grant of summary judgment of no willful infringement. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

#### DISCUSSION

In patent appeals, we apply the law of the regional circuit, here the First Circuit, to issues not unique to patent law. *AbbVie Deutschland GmbH & Co., KG v. Janssen Biotech, Inc.*, 759 F.3d 1285, 1295 (Fed. Cir. 2014). The First Circuit reviews the grant or denial of motions for summary judgment de novo. *Id.* It reviews the denial of judgment as a matter of law de novo, only reversing if the facts and inferences point so strongly and overwhelmingly in favor of the movant that a reasonable jury could not have reached a verdict against that party. *Id.* at 1297. The First Circuit also reviews the denial of a motion for a new trial for abuse of discretion. *Id.* at 1302.

## I. Patent Eligibility

Patent eligibility under 35 U.S.C. § 101 is an issue of law we review de novo. *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1338 (Fed. Cir. 2017). Anyone who “invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof” may obtain a patent. 35 U.S.C. § 101. Because patent protection does not extend to claims that monopolize the “building blocks of human ingenuity,” claims directed to laws of nature, natural phenomena, and abstract ideas are not patent eligible. *Alice Corp. Pty. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014). The Supreme Court instructs courts to distinguish between claims that claim patent ineligible subject matter and those that “integrate the building blocks into something more.” *Id.* First, we “determine whether the claims at issue are directed to a patent-ineligible concept.” *Id.* at 2355. If so, we “examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Id.* at 2357 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 72, 79 (2012)). If the elements involve “well-understood, routine, [and] conventional activity previously engaged in by researchers in the field,” *Mayo*, 566 U.S. at 73, they do not constitute an “inventive concept.” As argued by the parties, the step two dispute in this case turns entirely on whether the combination of elements was well-understood, routine, and conventional at the time of the invention. In these circumstances, the second step of the *Mayo/Alice* test is satisfied when the claim limitations “involve more than performance of ‘well-understood, routine, [and] conventional activities previously known to the industry.’” *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass’n*, 776 F.3d 1343, 1347–48 (Fed. Cir. 2014) (quoting *Alice*, 134 S. Ct. at 2359); see also *Intellectual*

*Ventures I LLC v. Erie Indem. Co.*, 850 F.3d 1315, 1328 (Fed. Cir. 2017) (holding that the features constituting the inventive concept in step two of *Mayo/Alice* “must be more than ‘well-understood, routine, conventional activity’” (quoting *Mayo*, 132 S. Ct. at 1298)); *Affinity Labs of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1262 (Fed. Cir. 2016) (same); *Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1350 (Fed. Cir. 2016) (“[I]t is of course now standard for a § 101 inquiry to consider whether various claim elements simply recite ‘well-understood, routine, conventional activit[ies].’” (second alteration in original) (quoting *Alice*, 134 S. Ct. at 2359)).

After trial, the district court denied Kaz’s motion for judgment of invalidity under § 101. There is no dispute in this case that the asserted claims employ a natural law to achieve their purpose. The claims recite a “method of detecting human body temperature” and “a body temperature detector” which generally utilize temperature readings from the forehead skin and the ambient temperature to calculate an approximate core body temperature. *See, e.g.*, ’685 patent at claim 17; ’938 patent at claim 60. And a significant portion of the specification is dedicated to deriving the mathematical equations to calculate core temperature based on ambient and skin temperature readings. ’685 patent at 6:58–8:45. What the parties dispute, however, is whether the additional claimed steps beyond calculating the temperature present a novel technique in this computation or add an inventive concept sufficient to transform the claims into a patent-eligible application.

The district court reasoned that “while the asserted claims are based in natural phenomena,” the claims recite additional steps which, like the claims in *Diamond v. Diehr*, 450 U.S. 175 (1981), “transformed the underlying natural laws into inventive methods and useful devices that noninvasively and accurately detect human body

temperature.” J.A. 110, 113–14. The court noted that the asserted claims each recite a subset of three steps: (1) moving while laterally scanning (’685 patent claims 7, 14, and 17; ’938 patent claims 17, 24, 33, 60, and 66); (2) obtaining a peak temperature reading (’685 patent claim 7; ’938 patent claims 60 and 66); and (3) obtaining at least three readings per second (’938 patent claims 17, 24, 39, 40, 46, and 49). Kaz argued both below and on appeal that these additional elements were known in the prior art. The district court held simply being known in the art did not suffice to establish that the subject matter was not eligible for patenting. The district court recognized that a “new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made.” J.A. 112 (quoting *Diehr*, 450 U.S. at 188). The district court found that though these claim elements may have been known in the art, they were “previously utilized to detect hot spots indicating injury or tumors, or surface temperature differentials,” not used to solve the problem of detecting arterial temperature beneath the skin. J.A. 112–13. For example, the jury heard testimony that a known technique for scanning tissue and using differential ambient and scanned temperatures was used to detect injury in horses, not take human body temperature. Likewise, the prior art DermaTemp product used a sensor that could take readings ten times a second and “lock on the highest temperature,” but this product was used to scan differential surface temperatures for diagnostic purposes “to find an injury or a hot spot.”<sup>3</sup>

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<sup>3</sup> The dissent suggests Exergen’s claimed invention amounts to simply using DermaTemp, a preexisting temperature detector to take a measurement of forehead skin temperature. Dissent at 5. The patentee presented evidence that the DermaTemp product was not, however,



J.A. 5319, 15565. And these methods made no use of the newly calculated coefficient for translating measurements taken at the forehead into core body temperature readings. After considering all the trial testimony and evidence, the district court found that “there is no evidence in the record” that these methods were well-understood, routine, and conventional prior to the introduction of Exergen’s invention. J.A. 113.

The district court’s conclusion that these claim elements were not well-understood, routine, and conventional is a question of fact to which we must give clear error deference. Like indefiniteness, enablement, or obviousness, whether a claim is directed to patentable subject matter is a question of law based on underlying facts. *Akzo Nobel Coatings, Inc. v. Dow Chem. Co.*, 811 F.3d 1334, 1343 (Fed. Cir. 2016) (“Indefiniteness is a question of law that we review de novo, subject to a determination of underlying facts.” (citation omitted)); *Alcon Research Ltd. v. Barr Labs., Inc.*, 745 F.3d 1180, 1188 (Fed. Cir. 2014) (“Whether a claim satisfies the enablement requirement of 35 U.S.C. § 112 is a question of law that we review without deference, although the determination may be based on underlying factual findings, which we review for clear error.”); *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1047 (Fed. Cir. 2016) (en banc) (“Obviousness is a question of law based on underlying facts.”). We have previously stated that while the § 101 inquiry is

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capable of measuring core body temperature by scanning across the forehead due to its design. J.A. 15561–62, 15568, 15586, 15683. We cannot say, based on the evidence of record, that the district court clearly erred when it concluded that the DermaTemp product did not result in the claimed combination being well-understood, routine, and conventional.

ultimately a legal question, sometimes the inquiry may contain underlying factual issues. *Mortg. Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314, 1325 (Fed. Cir. 2016); *Accenture Glob. Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1342 (Fed. Cir. 2013). And the Supreme Court recognized that in making the § 101 determination, the inquiry “might sometimes overlap” with other fact-intensive inquiries like novelty under § 102. *Mayo*, 566 U.S. at 90.

As our cases demonstrate, not every § 101 determination contains disputes over the underlying facts. *See, e.g., Content Extraction*, 776 F.3d at 1349 (patent owner conceded the argued inventive concept “was a routine function of scanning technology at the time the claims were filed”); *Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1370 (Fed. Cir. 2015) (patent owner argued an “interactive interface” is “a specific application of the abstract idea that provides an inventive concept” and did not dispute that the computer interface was generic). As we indicated in *Berkheimer v. HP Inc.*, No. 2017-1437, at 13 (Fed. Cir. Feb. 8, 2018), “[n]othing in this decision should be viewed as casting doubt on the propriety of those cases.”

The question of whether a claim element is well-understood, routine, and conventional to a skilled artisan in the relevant field is a question of fact and deference must be given to the determination made by the fact finder on this issue. Something is not well-understood, routine, and conventional merely because it is disclosed in a prior art reference. There are many obscure references that nonetheless qualify as prior art. For example, we have held that a single copy of a thesis written in German and located in a German university library was a printed publication because that thesis was available to the public. *In re Hall*, 781 F.2d 897, 897–900 (Fed. Cir. 1986). This type of evidence, for example, would not suffice to establish that something is “well-understood, routine, and

conventional activity previously engaged in by scientists who work in the field.” *Mayo*, 566 U.S. at 79.<sup>4</sup>

This case is not like either *Mayo* or *Ariosa*, where well-known, existing methods were utilized to determine the existence of a natural phenomenon. In *Mayo*, the claimed method was directed to measuring metabolite levels in the blood (and determining the relationship to toxicity and effectiveness), a “natural law.” 566 U.S. at 77. The methods of measurement “were well known in the art” and were “well-understood, routine, conventional activity.” *Id.* at 80. Similarly, in *Ariosa* the claimed method was directed to measuring fetal DNA in the mother’s blood, a “naturally occurring phenomenon.” *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1376 (Fed. Cir. 2015), *cert denied*, 136 S. Ct. 2511 (2016). The measurement method there, too, was “conventional, routine and well understood.” *Id.* at 1378.

This case is different. Here, the patent is directed to the measurement of a natural phenomenon (core body temperature). Even if the concept of such measurement is directed to a natural phenomenon and is abstract at step one, the measurement method here was not conventional, routine, and well-understood. Following years and millions of dollars of testing and development, the inventor determined for the first time the coefficient representing

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<sup>4</sup> In this case, the district court held that whether the technique of scanning while moving a radiation detector was well-understood, routine, and conventional was a “close” question. J.A. 94. It noted that Kaz had shown that 30-year-old patents disclosed such scanning. However, the court found that Kaz had the burden of proof and that based on the evidence before it, “it is unclear whether this technique has become so prevalent as to be routine or conventional.” J.A. 94.

the relationship between temporal-arterial temperature and core body temperature and incorporated that discovery into an unconventional method of temperature measurement. As a result, the method is patent eligible, similar to the method of curing rubber held eligible in *Diehr*.<sup>5</sup> In other words, at the second step of *Mayo/Alice*, the patent incorporated an inventive concept. The same is true here. The inventor “transformed the process into an inventive application of the formula.” *Id.* at 81.

In *Alice*, the claims recited only the method for exchanging financial obligations and a generic computer system. 134 S. Ct. at 2353. There was no dispute in that case that the use of a generic computer in implementing the method was well-understood and conventional; the only argument advanced by the patent-holder at step two was that “the claims are patent eligible because these steps require a substantial and meaningful role for the computer.” *Id.* at 2359 (internal quotation omitted). In *Mayo*, the Supreme Court noted that the patents themselves stated that the claimed methods for determining metabolite levels were well-known in the art, an issue which was not disputed by the parties. 566 U.S. at 79. The Supreme Court did not hold that district court fact finding was not entitled to deference.

In *Ariosa*, like *Mayo*, there was no dispute that the claimed methods were well-known, routine and conventional. We cited the patent specification and prosecution history which repeatedly conceded this point. 788 F.3d at 1377 (“The ’540 patent provides that [t]he preparation of

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<sup>5</sup> In *Mayo*, the Supreme Court cited *Diehr* for the proposition that “a process is not unpatentable simply because it contains a law of nature or a mathematical algorithm.” 566 U.S. at 71 (quoting *Diehr*, 450 U.S. at 187).

serum or plasma from the material blood sample is carried out by standard techniques.” (quoting specification)); *id.* (“[The specification] provides that ‘[s]tandard nucleic acid amplification systems can be used . . . .’” (quoting specification)); *id.* at 1378 (“[O]ne skilled in the art is aware of a variety of techniques which might be used to detect different nucleic acid species. . . . These techniques are a matter of routine for one skilled in the art for the analysis of DNA.” (quoting prosecution history)); *id.* (“[O]ne skilled in the art is readily able to apply the teachings of the present invention to any one of the well-known techniques for detection of DNA . . . .” (quoting prosecution history)). And the parties did not dispute this issue. In such a case, with no contrary evidence, no genuine issue of fact existed to prevent summary judgment.

In *Bascom*, we reversed the 12(b)(6) dismissal holding “[o]n this limited record, this specific method of filtering Internet content cannot be said, as a matter of law, to have been conventional or generic.” *Bascom Glob. Internet Servs.*, 827 F.3d at 1350. Rather than suggest that this inquiry is a legal one, this suggests it is very much a factual one. In *Bascom*, we did not reverse without deference the district court’s determination regarding well-understood, conventional and routine, we held that there were sufficient allegations to support an inventive concept and that “[w]e find nothing on this record that refutes those allegations as matter of law or justifies dismissal under 12(b)(6).” *Id.* at 1352.

The dissent does not dispute that whether claim elements are well-understood, routine, and conventional in a particular art at a particular time is a fact finding. Nor does it dispute that such fact findings by the district court after a full trial on the merits are entitled to deference and should be reviewed for clear error. Instead, the dissent argues that the district court’s fact finding in this case regarding whether the claimed temperature meas-

urement method is well-understood, routine, and conventional is clearly erroneous. For the reasons discussed, we do not agree.

After a trial, the district court in this case concluded that the claimed combination at issue was not proven to be well-understood, routine, and conventional. It cited the evidence presented at trial and from the patent specifications. This is a fact finding reviewed for clear error. We conclude that the district court fact finding that the claimed combination was not proven to be well-understood, routine, and conventional is not clearly erroneous.

Kaz also argues that it was inappropriate for the district court to make these fact findings because it had a Seventh Amendment right to have a jury resolve any underlying factual disputes. The Seventh Amendment preserves the right to a jury trial for “[s]uits at common law.” U.S. Const. Amend. VII. The Supreme Court has construed this language to require a jury trial for those actions in which only legal rights and remedies are at issue, as opposed to equitable rights and remedies. *Tull v. United States*, 481 U.S. 412, 417 (1987). Whether a modern statutory cause of action satisfies this language requires a two-step inquiry, first comparing the “action to 18th-century actions brought in the courts of England prior to the merger of the courts of law and equity,” and second, examining the remedy sought to determine whether it is legal or equitable in nature. *Id.* at 417–18. Kaz analogizes patent eligibility to obviousness, arguing that both are legal questions with underlying factual components to which a right to trial by jury exists. Kaz acknowledges that there are legal questions in patent cases which can contain underlying factual components such as claim construction to which there is no right to trial by jury.

Whether the Seventh Amendment guarantees a jury trial on any factual underpinnings of § 101 is a question which awaits more in-depth development and briefing than the limited discussion in this case. We need not decide that question in this case because Kaz waived its right to a jury trial for the factual issues underlying the § 101 determination in this case.

Three actions by Kaz demonstrate waiver of any potential right to a jury trial for fact issues underlying § 101. First, in the joint pretrial memorandum, Kaz agreed that § 101 is “a question of law to be decided by the Court” and “[t]o the extent the Court *elects* to have the jury decide underlying factual issues relevant to § 101, the parties submit proposed special interrogatories in their respective proposed special verdict questions.” J.A. 13979–80 (emphasis added). The use of the word “elects” indicates that the parties agreed that the district court may, in its discretion, opt to send fact issues to the jury or not. Second, during trial, when the district court informed the parties that it would not give the jury any special verdict questions on § 101 because the jury may confuse the obviousness inquiry with the well-understood, conventional, routine inquiry, Kaz did not object. See *Marcano-Rivera v. Pueblo Int’l, Inc.*, 232 F.3d 245, 253 n.4 (1st Cir. 2000) (“In this Circuit, [s]ilence after instructions, including instructions on the form of the verdict to be returned by the jury, typically constitutes a waiver of any objections.” (alteration in original) (quoting *Putnam Res. v. Pateman*, 958 F.2d 448, 456 (1st Cir. 1992))); see also Fed. R. Civ. P. 49(a)(3). Finally, in the introduction of its post-trial motion for judgment of invalidity, Kaz stated, “§ 101 is an issue for the Court to resolve now, in the first instance, as both *the finder of fact* and the arbiter of law.” J.A. 16672 (emphasis added). These three affirmative actions, occurring before, during, and after trial, demonstrate that Kaz acquiesced in the district court’s resolution of any underlying fact questions.

## II. Infringement of the '685 Patent

Claims 7, 14, and 17 of the '685 patent recite “computing an internal body temperature” as a “function of ambient temperature and” either “the peak temperature reading” (claim 7) or “sensed surface temperature” (claims 14 and 17). All three claims require detecting temperature by laterally scanning a detector across the forehead. The parties’ joint claim construction statement stipulated that “internal body temperature” means “temperature of a region of the body existing beneath the sensed surface.” The parties agree that the “sensed surface” in the claims is the forehead. Therefore, the limitations requiring “computing an internal body temperature,” according to the parties’ agreed construction, requires *computing the temperature* of a region of the body existing *beneath the forehead*.

The district court correctly instructed the jury on the claim construction, and the jury found claims 7, 14, and 17 of the '685 patent infringed. The district court denied Kaz’s post-trial motion for judgment of noninfringement as a matter of law, reasoning that evidence supported a finding that the “temperature of a region of the body existing beneath the sensed surface” limitation was met because the oral-equivalent temperature “reported by the accused devices was not the measured oral temperature, and was higher than the skin temperature, but lower than the temperature of the temporal artery.” J.A. 57. We review the jury’s infringement findings for substantial evidence. *Hewlett-Packard Co. v. Mustek Sys., Inc.*, 340 F.3d 1314, 1318 (Fed. Cir. 2003).

Kaz argues the jury’s verdict of direct infringement of '685 claims 7, 14, and 17 is not supported by substantial evidence because the accused devices calculate an oral-equivalent temperature, not the temperature of the body beneath the forehead. We agree and reverse the verdict of



infringement with respect to claims 7, 14, and 17 of the '685 patent.

It is undisputed how the accused devices work: they measure the temperature at the forehead and the ambient temperature, and then they use look-up tables stored in memory to determine the *oral-equivalent* temperature that is provided to the user. The claims as construed, however, require computing the temperature of a region of the body existing beneath the forehead, not the oral-equivalent temperature.

The record evidence demonstrates that because warm blood circulates throughout the body's arteries, and because other body temperatures range from the surface temperature of the skin to the arterial temperature, both the oral-equivalent temperature and the temperature of the body beneath the forehead may operate within the same range of temperatures. But demonstrating that two different temperatures operate within the same range is not the same as demonstrating that the accused devices actually compute the temperature of a particular region of the body. Though the oral-equivalent temperature may be insubstantially different from the temperature of the area of the body beneath the forehead, infringement under the doctrine of equivalents is not an issue in this case.

Exergen argues its expert testified that the accused devices add temperature back in to the measured forehead surface temperature to compensate for the heat loss, so the accused devices therefore calculate the temperature of the region of tissue beneath the forehead skin. At best, Exergen's cited testimony demonstrates that the oral-equivalent temperature calculated by the accused devices *approximates* the temperature of the body beneath the forehead. While this evidence supports the jury's infringement verdict for the asserted claims of the '938 patent, each of which requires a determination of a "body

temperature approximation,” it does not evidence that the devices compute the temperature of the region of the body existing beneath the forehead. Unlike the ’685 claims, the ’938 claims’ recitation of the term “approximation” indicates that the claims do not expressly require computation of the temperature under the scanned area, so long as the calculation approximates the temperature under the scanned area. Therefore, while this testimony supports the jury’s infringement verdict with respect to the ’938 claims, it cannot support the jury’s verdict with respect to the asserted ’685 claims. We conclude that the jury’s determination of infringement of ’685 claims 7, 14, and 17 is not supported by substantial evidence.

### III. Damages

35 U.S.C. § 284 allows damages “adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer, together with interest and costs as fixed by the court.” The patent owner, upon proving infringement, may receive a reasonable royalty or lost profits, but not both for the same infringing units. *Asetek Danmark A/S v. CMI USA Inc.*, 852 F.3d 1352, 1362 (Fed. Cir. 2017). The jury’s determination of the amount of damages is a fact question that we review for substantial evidence, and we review the underlying methodology, including consistency of the award with governing legal principles, for abuse of discretion. *Id.*

Kaz argues both the reasonable royalty and lost profits portions of the jury’s damages award are unsupported by substantial evidence. It argues that the reasonable royalty part of the jury’s award translates into a per-unit rate of 32% of the projected sales price and 71% of Kaz’s projected per-unit net profit. It argues the hypothetical, nonexclusive, U.S.-only royalty agreement contemplated in this case should be set at a rate less than 5.7%, the rate for the worldwide and exclusive license agreement Kaz

entered for a different thermometer. Kaz also argues the lost profits portion of the jury award improperly included lost profits for CVS stores, where Exergen did not sell any products.

While a royalty that would have given Exergen 71% of Kaz's projected net profit is certainly steep, we do not review such fact findings de novo. There was substantial evidence presented at trial which supports the jury's conclusion that in a hypothetical negotiation, Kaz would have been willing to pay such a price to enter the market. Exergen's damages expert went through each of the factors in *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116 (S.D.N.Y. 1970), explaining why each relevant factor weighed in favor of a high royalty rate. For instance, Exergen's expert explained that the parties were "fierce competitors" at the time of the hypothetical negotiation, and Exergen would have known that if it licensed the patents to Kaz, it would have lost sales. J.A. 16287. He testified that Exergen had no licenses with respect to the patents-in-suit, and would have needed to be "highly incentivized" to license the patents for a technology with "advantages that other products didn't have, namely, the noninvasive, the gentle nature of the product." J.A. 16294, 16297. He further testified that Kaz would have been incentivized to "pay a slightly higher royalty" because there were nine years left on the patents, which would have been a long time to sit out of a growing market. J.A. 16296. The jury was not required to give more weight to Kaz's license, particularly in light of mitigating testimony that the agreement was for a different type of thermometer "of unknown appeal," was based on patent applications, and was not between competitors. J.A. 16419–20. Kaz has not presented any evidence that the jury's reasonable royalty would not have been feasible from a business perspective—indeed, Kaz would have still made 29% of its projected per-unit profit. The jury was entitled to credit Exergen's evidence that

Kaz would have been highly motivated to pay a premium to enter the market.

The jury's lost profits award with respect to CVS, the only retailer disputed on appeal, is also supported by substantial evidence. Trial testimony established that CVS offers its own generic products alongside a single branded product. The jury was entitled to find that had Kaz's thermometers not been on the market, CVS would have chosen Exergen's competing product to be the branded product. While "the patentee needs to have been selling some item, the profits of which have been lost due to infringing sales, in order to claim damages consisting of lost profits," *Poly-America, L.P. v. GSE Lining Tech., Inc.*, 383 F.3d 1303, 1311 (Fed. Cir. 2004), our precedent does not require sales to have been lost in any particular way. Even though the inventor testified that CVS did not carry Exergen's products because Exergen previously sued them for patent infringement, the jury was entitled to find that in the absence of a feasible alternative product, CVS would have turned to Exergen despite their history of litigation. Trial testimony demonstrated that another major retailer who Exergen had previously sued "got over it" and later carried Exergen's product. J.A. 16411–13.

We hold that both portions of the jury's damage award are supported by substantial evidence. However, because we reverse the jury's finding of infringement for claims 7, 14, and 17 of the '685 patent, we vacate the damage award and remand to the district court to determine the consequences of our holding for the award. The parties agree that a recalculation of damages would be necessary, but dispute whether a new trial on damages is warranted. We leave this to the district court.

#### IV. Enhanced Damages

We review the district court's decision on enhanced damages under 35 U.S.C. § 284 for abuse of discretion. *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 136 S. Ct. 1923, 1934

(2016). In *Halo*, the Supreme Court rejected our previous test for willful infringement as one that “unduly confines the ability of district courts to exercise the discretion conferred on them.” *Id.* at 1935 (rejecting *In re Seagate Tech., LLC*, 497 F.3d 1360, 1371 (Fed. Cir. 2007)).

In this case, the district court granted summary judgment of no willfulness prior to the *Halo* decision and held that because Kaz’s invalidity contentions were not objectively unreasonable, it need not decide the subjective prong of *Seagate*. After additional briefing following the Supreme Court’s grant of certiorari in *Halo*, the district court denied Exergen’s post-trial motion for enhanced damages. It reviewed the factors in *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 827 (Fed. Cir. 1992), and held “[e]ven absent the [*Seagate*] willfulness threshold, the *Read* factors do not compel enhanced damages in this case.” J.A. 54.

We cannot conclude that the district court abused its discretion in applying the *Read* factors and declining to award enhanced damages. Because the Supreme Court held that *Seagate*’s requirement of “a finding of objective recklessness in every case before district courts may award enhanced damages” unduly restricted the discretion of the district court, *Halo*, 136 S. Ct. at 1932, we have vacated previous enhanced damages decisions premised only on *Seagate*’s objective prong. *See, e.g., Alfred E. Mann Found. for Sci. Research v. Cochlear Corp.*, 841 F.3d 1334, 1345 (Fed. Cir. 2016); *WesternGeco L.L.C. v. ION Geophysical Corp.*, 837 F.3d 1358, 1363 (Fed. Cir. 2016). But in this case the district court’s summary judgment of no willfulness based on the objective prong of *Seagate* was not the only rationale on the record. The district court did not clearly err in its later consideration of the *Read* factors. For example, the district court found that no evidence of copying existed, that no concealment or litigation misconduct had occurred, and that Exergen was able to “more than adequately vindicate its rights.”

J.A. 54. Consistent with the exercise of its discretion, *Halo*, 136 S. Ct. at 1933, the district court took into account the particular circumstances of this case and concluded “on balance, this case is not of an exceptional nature warranting an award of multiple damages.” J.A. 54.

Exergen argues a jury must consider willfulness before the district court may exercise its discretion to enhance damages under § 284, but such a blanket rule is directly contrary to the Supreme Court’s mandate that courts exercise their discretion free from inelastic rules like the *Seagate* test. *Halo*, 136 S. Ct. at 1933–34; see *Arctic Cat Inc. v. Bombardier Recreational Prod. Inc.*, 876 F.3d 1350, 1371–72 (Fed. Cir. 2017) (refusing to adopt a blanket rule that a district court abuses its discretion by deciding an issue without briefing by the parties). Even if the jury had found that Kaz’s infringement was willful, “an award of enhanced damages does not necessarily flow from a willfulness finding.” *Presidio Components, Inc. v. Am. Tech. Ceramics Corp.*, 875 F.3d 1369, 1382 (Fed. Cir. 2017). Under the circumstances of this case, the district court did not abuse its discretion in analyzing the *Read* factors, taking into account the overall circumstances of the case, and denying enhanced damages. We affirm the district court’s denial of enhanced damages.

#### CONCLUSION

For the foregoing reasons, we affirm the district court’s denial of judgment as a matter of law that the claims were ineligible under 35 U.S.C. § 101 and its denial of enhanced damages in this case. We reverse the verdict of infringement with respect to claims 7, 14, and 17 of the ’685 patent. We see no clear error in the award of damages for both reasonable royalty and lost profits. We nonetheless vacate and remand the damage award for a determination by the district court of the impact our

reversal of infringement of the '685 patent claims has on the damage award.

**AFFIRMED-IN-PART, REVERSED-IN-PART,  
VACATED-IN-PART, AND REMANDED**

COSTS

No costs.

# United States Court of Appeals for the Federal Circuit

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**EXERGEN CORPORATION,**  
*Plaintiff-Cross-Appellant*

v.

**KAZ USA, INC.,**  
*Defendant-Appellant*

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2016-2315, 2016-2341

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Appeals from the United States District Court for the District of Massachusetts in No. 1:13-cv-10628-RGS, Judge Richard G. Stearns.

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HUGHES, *Circuit Judge*, dissenting.

We determine whether a patent claims eligible subject matter under 35 U.S.C. § 101 through a two-step test. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66 (2012). At step one, we determine whether the claims are directed toward a patent-ineligible concept. *Alice Corp. Pty. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014). If so, we consider at step two whether the claims nonetheless embody a sufficiently inventive concept to transform the claimed invention into a patent-eligible application. *Id.* (quoting *Mayo*, 566 U.S. at 78).

The majority reaches step two, affirming the district court's determination that the claims of the '685 and '938 patents embody inventive concepts. In my view, the



claimed inventions merely calculate a law of nature using conventional, commercially available technology. Following the principle that well-understood, routine, and conventional activities cannot supply an inventive concept, I would find the asserted claims are patent ineligible under § 101. Thus, I respectfully dissent from the majority's conclusion that the asserted claims are patent eligible.

## I

The majority's opinion does not appear to decide whether the asserted claims are directed toward an ineligible concept at step one. The majority recognizes “[t]here is no dispute . . . that the asserted claims employ a natural law to achieve their purpose,” Maj. Op. at 7, but not every invention that makes use of a natural law is directed toward a law of nature, see *Rapid Litig. Mgmt. Ltd. v. CellzDirect, Inc.*, 827 F.3d 1042, 1048–49 (Fed. Cir. 2016). While the district court noted that it was “persuaded” of the claims’ patent eligibility at step one, J.A. 110, the majority focuses exclusively on the parts of the district court’s decision that concern whether the claim elements were well-understood, routine, or conventional, see Maj. Op. at 8–11.

In my view, the asserted claims are directed toward the law of nature that governs the relationship between core body temperature and forehead skin temperature. An invention is directed to a patent-ineligible concept when it “begins and ends” with that concept. *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1376 (Fed. Cir. 2015). In *Ariosa*, the claimed methods began with a cffDNA sample taken from maternal plasma and ended with isolated, paternally inherited cffDNA. *Id.* Because both cffDNA’s presence in maternal plasma and the existence of paternally inherited cffDNA were natural phenomenon, the claimed methods were directed toward patent-ineligible natural phenomenon. *Id.* Relatedly,

claims are directed to patent-ineligible concepts “when they amount[] to nothing more than observing or identifying the ineligible concept itself.” See *Rapid Litig.*, 827 F.3d at 1048.

The asserted claims begin and end with a law of nature. The claims cover temperature detectors that calculate a person’s core body temperature. ’685 patent col. 2 l. 60–col. 3 l. 12. The claimed invention first detects ambient air temperature and the temperature of forehead skin directly over the temporal artery. *Id.* at col. 2 ll. 10–14. It then inputs these temperatures into a “heat balance equation,” a mathematical representation of the law of nature that governs the relationship between skin, air, and core temperatures. *Id.* at col. 7 l. 3–col. 8 l. 8. This heat balance equation applies the principle that heat generated by a person’s body flows throughout the body and, eventually, into the environment. The prior art recognized long ago that this principle enabled the calculation of core body temperature from skin and air temperature measurements. For instance, in 1989 Exergen filed an application that became U.S. Patent No. 5,012,813, which discloses a radiation detecting thermometer that uses the heat balance relationship between ear skin temperature and core temperature. Because heat does not flow from the body’s core to every area of skin in the same way, the heat balance approach to measuring core temperature requires identifying a coefficient that corresponds to the relationship between core temperature and the temperature of the specific area of skin being measured. The novel feature of the heat balance equation used by the ’685 and ’938 inventions is the inventor’s identification through empirical testing of the coefficient that governs the relationship between core temperature and the temperature of skin above the temporal artery. The claimed invention uses this heat balance equation to calculate and display the person’s core body temperature. *Id.* at col. 3 ll. 17–19. Unlike in *Diamond v. Diehr*, where

a patentable invention used Arrhenius' equation as an intermediate step in a rubber curing process, 450 U.S. 175, 191–93 (1981), Exergen's claimed invention amounts to nothing more than an observation of the natural phenomenon governed by the heat balance equation. The invention begins by detecting the equation's inputs and ends by displaying its output. Thus, the asserted claims are directed toward a patent-ineligible law of nature.

At step two, if claims are directed to a patent-ineligible concept, we “consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Alice*, 134 S. Ct. at 2355 (quoting *Mayo*, 566 U.S. at 78–79). These transformative elements must supply an “inventive concept” that ensures the patent amounts to “significantly more than a patent upon the [ineligible concept] itself.” *Id.* (quoting *Mayo*, 566 U.S. at 72–73) (alteration in original). Claim elements that recite “conventional, routine and well understood applications in the art” are insufficient to “supply an inventive concept.” *Ariosa*, 788 F.3d at 1378.

Even under a deferential standard of review, the district court clearly erred by finding that the claims of the '685 and '938 patents embody an inventive concept. The asserted claims recite a temperature detector that performs a subset of three steps: (1) moving while laterally scanning over an artery or forehead; (2) obtaining a peak temperature reading; and (3) taking plural skin temperature measurements per second. *See, e.g.*, '685 patent col. 9 ll. 41–43; '938 patent col. 10 ll. 60–67. Most of the claims also recite using a radiation detector. Temperature-detecting products that make use of these elements have existed for decades. The district court recognized that “patents dating from more than 30 years ago disclosed the technique of scanning while moving a radiation detecting device.” J.A. 94. For example, U.S. Patent No.

3,351,642, issued in 1970, describes an infrared thermometer with a sensor that permits “scanning across a portion of a patient’s body, for example a forehead.” J.A. 17594. Similarly, obtaining peak temperatures and taking multiple measurements per second are ubiquitous features in the prior art. The ’685 and ’938 specifications disclose that these features are present in Exergen’s other products, including its D501 Industrial Temperature Detector and prior ear temperature detectors. ’685 patent col. 8 l. 60–col. 9 l. 4; ’938 patent col. 9 ll. 2–15.

At the time of invention, the combination of these elements into a single product was also well-known. For instance, the district court recognized that Exergen commercially sold DermaTemp, a radiation detecting thermometer capable of taking ten readings per second and tracking peak temperatures. The district court found that these devices were scanned over skin to “detect hot spots indicating injury or tumors, or surface temperature differentials.” J.A. 112. This finding aligns with the DermaTemp operating manual, which indicates that DermaTemp could be used to measure forehead temperature in order to detect surgery side effects. The district court therefore recognized that prior art products combined skin scanning, obtaining peak temperatures, and taking multiple temperature measurements per second. These findings reveal that, aside from its use of a newly discovered heat balance coefficient, Exergen’s claimed invention amounts to nothing more than using a preexisting temperature detector to take a conventional and routine measurement of forehead skin temperature. Absent the patent-ineligible law of nature, the claimed invention consists entirely of elements already combined by the prior art. Thus, the claimed combination of elements lacks an inventive concept because the combination was well-understood, routine and conventional at the time of invention.

In reaching the opposite conclusion, the district court legally erred by using a law of nature to supply an inventive concept. The district court never found that the combination of taking multiple measurements while scanning laterally across the forehead to determine peak temperature was not well-understood, routine, and conventional. It only found that there was “no evidence . . . that these steps were ‘well-understood, routine, [or] conventional[ly]’ used to *detect arterial temperature beneath the skin.*” J.A. 113 (alterations in original) (emphasis added). Rather than finding that the claim elements were not routine or conventional, the district court focused on whether those elements were routinely or conventionally used for the purpose of calculating core body temperature. It differentiated the claimed invention from the prior art solely on the basis that the claimed invention “solve[s] a different problem.” J.A. 112.

We rejected identical reasoning in *Ariosa*. There, the patentee argued its claimed methods of amplifying and detecting paternal cffDNA in maternal plasma supplied an inventive concept because such methods had never been used on maternal plasma samples. *Ariosa*, 788 F.3d at 1379. We noted that the claimed cffDNA amplification and detection methods were well-understood, routine and conventional. *Id.* at 1378. As a result, the patentee’s argument implied that the inventive concept lied solely in the natural phenomenon that paternal cffDNA exists in maternal plasma. *Id.* at 1379. Although the claimed methods solved a novel problem, using conventional techniques for a new purpose did not supply an inventive concept that amounted to significantly more than the natural phenomenon to which the claims were directed.

Here, the district court similarly erred. Despite recognizing that temperature detectors identical to the claimed invention already existed for other purposes, the district court reasoned that these prior detectors never used forehead skin temperature measurements to calcu-

late core body temperature. Like in *Ariosa*, this reasoning implicitly relies upon the relationship between forehead skin temperature and core body temperature to supply an inventive concept. Although the invention calculates core body temperature from forehead temperature, those calculations merely reflect the natural relationship between forehead and core body temperatures. Accordingly, the district court clearly erred by finding an inventive concept based on the asserted claims' use of well-understood, routine, and conventional temperature-measuring techniques for this new purpose.

The majority attempts to salvage the district court's decision by emphasizing the novelty of the heat balance coefficient. In doing so, the majority misapplies the step two analysis from the *Mayo/Alice* framework. Step two is "a search for an 'inventive concept'—*i.e.*, an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.'" *Alice*, 134 S. Ct. at 2355 (internal quotation marks omitted) (quoting *Mayo*, 566 U.S. at 72–73). After identifying an ineligible concept at step one, we ask at step two "[w]hat else is there in the claims before us?" *Mayo*, 566 U.S. at 78. Clearly, a patent-ineligible law of nature cannot be the inventive concept that ensures the claimed invention amounts to significantly more than a patent upon that law of nature. Yet the majority argues exactly that, reasoning that Exergen's temperature detector is "unconventional" at step two because it uses "for the first time the coefficient representing the relationship between temporal-arterial temperature and core body temperature." Maj. Op. at 11–12. The majority's analysis fails to identify any combination of claim elements that is not well-understood, routine, and conventional aside from the use of a newly discovered law of nature. This is unsurprising because the prior art contains temperature detectors like DermaTemp that incorporate every element of

the claimed invention besides the heat balance equation. To overcome the claimed invention's lack of an inventive concept, the majority opinion erroneously conflates step two with a novelty inquiry. *Cf. Mayo*, 566 U.S. at 90 (“[I]n evaluating the significance of additional steps, the § 101 patent-eligibility inquiry and, say, the § 102 novelty inquiry might sometimes overlap. But . . . to shift the patent-eligibility inquiry entirely to these later sections risks creating significantly greater legal uncertainty, while assuming that those sections can do work that they are not equipped to do.”).

I am not suggesting that considering the integration of a law of nature into the claimed invention is improper at every stage of § 101 analysis. Indeed, step one requires us to examine the claims holistically in order to determine whether they are directed to an ineligible concept. *See Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016) (“Rather, the ‘directed to’ inquiry applies a stage-one filter to claims, considered in light of the specification, based on whether ‘their character as a whole is directed to excluded subject matter.’” (quoting *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed.Cir.2015))). Upon reaching step two, however, we focus more narrowly on the claim elements other than the invention's use of the ineligible concept to which it is directed. Accordingly, the majority's analysis of the claims as a whole belongs at step one. At either step, however, for the reasons discussed above, a claimed invention's unconventionality, by itself, is not sufficient to render the claim patent eligible.

## II

Based on the foregoing, I would find that the asserted claims of the '685 and '938 patents are directed to the law of nature that governs the relationship between core body temperature and forehead skin temperature, and that the claims lack an inventive concept sufficient to transform

them into patent-eligible inventions. Because this renders the asserted claims patent-ineligible subject matter under § 101, I would not reach the remaining issues on appeal. Accordingly, I respectfully dissent.