

No. 17-

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IN THE  
**Supreme Court of the United States**

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LEAK SURVEYS, INC.,

*Petitioner,*

*v.*

FLIR SYSTEMS, INC.,

*Respondent.*

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ON PETITION FOR A WRIT OF CERTIORARI TO THE UNITED  
STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

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**PETITION FOR A WRIT OF CERTIORARI**

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August 1, 2017

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## QUESTIONS PRESENTED

Arising from perhaps the largest factual and testimonial record compiled to date at the Patent Trial and Appeal Board (“PTAB”), the highly unusual factual and procedural record of this case presents a rare opportunity for the United States Supreme Court to address the following questions:

1. Does the Federal Circuit Court of Appeals necessarily exceed the scope of its limited appellate jurisdiction when it affirms a PTAB *inter partes* review (“IPR”) decision that rests upon a plain and egregious error, such as a PTAB claim construction that *literally strikes* a key word from the claims that was added during prosecution to distinguish the scope of the claims from prior art?

2. On appeal of an IPR decision by the PTAB to invalidate a patent or patent claim, when is the Federal Circuit required to provide a statement of its reasons for affirming – in order to safeguard constitutional limits on the Federal Circuit’s administrative appellate jurisdiction (*S.E.C. v. Chenery Corp.*, 318 U.S. 80 (1943)), and/or to comply with statutory requirements such as 35 U.S.C. §144 and 5 U.S.C. §§ 702, 704, and 706.

3. On appeal of an IPR decision by the PTAB to invalidate a patent or patent claim, when does the Federal Circuit violate a patent owner’s constitutional due process rights by considering and affirming based on arguments that were not previously considered by the PTAB, and/or for reasons apart from those stated by the PTAB itself in its written decision?

**PARTIES TO THE PROCEEDING -  
RULE 29.6 STATEMENT**

The parties to the proceedings include those listed on the cover.

Petitioner, who was Patent Owner-Appellant below, is: Leak Surveys, Inc. (“LSI”). LSI is not a publicly traded corporation, has no parent corporation, and no other publicly held corporation owns 10% or more of its stock. LSI is wholly owned by David Furry, the sole inventor for each of the patents at issue in the *inter partes* review proceedings below.

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## INTRODUCTION

Both the factual record and the procedural posture of this case are truly remarkable. The factual record leaves little doubt that inventor David Furry's inventive activities resulted in an important technical achievement that is worthy of patent protection. Yet, the PTAB below invalidated Furry's two issued U.S. patents with a decision premised upon fundamental errors that are both plain and egregious. On appeal, the Federal Circuit panel affirmed the PTAB's plainly erroneous decision without stating its reasons for affirmance; and the *en banc* Federal Circuit denied LSI's rehearing request, again without stating reasons.

Thus, it is fair to say that, absent relief from this Court, Furry's patents will be extinguished and the private property (patent rights) of his company (LSI) will forever be taken – but without any tribunal having provided a coherent justification for doing so, and without any statement of reasons from an Article III court at all.

LSI asserts in this petition that, on the facts of this case at least, the Federal Circuit's affirmance of the PTAB's private property taking, without stating its reasons for affirmance, amounts to a violation of LSI's constitutional due process rights. LSI further contends that the specific facts of this case provide substantial reason to conclude that the Federal Circuit exceeded the proper scope of its appellate jurisdiction in an appeal from an administrative trial such as IPR, and invoked FED. CIR. R. 36 to affirm without opinion because the PTAB's opinion could not be affirmed on its own stated reasons, and was instead affirmed by the Federal Circuit for reasons apart from those stated by the PTAB.

Few parties will ever be able to substantiate such bold claims. But LSI can, making this case a rare opportunity for the Court to explore the constitutional and statutory limits of the Federal Circuit's power to affirm a decision of the PTAB invalidating an issued patent, but without the Federal Circuit providing a statement of its reasons for affirming.

The IPRs below present perhaps the largest factual record compiled to date at the PTAB, featuring 24 declarations and 14 depositions, most from extraordinary scientists who gave testimony based on first hand *personal knowledge* of the American Petroleum Institute's unsuccessful efforts to solve an important technical problem that inventor David Furry was able to solve, and how Furry's inventive efforts had an immediate and long-lasting disruptive impact for leak detection and repair ("LDAR") in the petrochemical industry.

Furry's provisional patent application was filed in the U.S. Patent and Trademark Office ("PTO") in 2003, and was thoroughly examined for almost *nine years* by the PTO (including an examination appeal to the Board of Patent Appeals and Interferences, which Congress later reconstituted as the PTAB), before the PTO finally allowed his first patent in 2012. Yet, when Respondent FLIR Systems, Inc. ("FLIR") filed IPR petitions below to challenge Furry's two issued patents, the PTAB invalidated the patents primarily on a prior art reference that was not only considered during prosecution, but that is extensively discussed and distinguished in the patent specification itself. To reach its decision to extinguish LSI's patent rights, the PTAB (under the guise of claim construction) *literally struck* one of the most important

words from each patent claim – a word that was added in amendment to distinguish the claims from prior art. The PTAB then used this egregious “claim construction” as its only justification for ignoring the remarkable and compelling record of objective evidence that LSI had presented for the PTAB to consider in connection with the PTAB’s obviousness determination under 35 U.S.C. §103.

LSI’s appeal to the Federal Circuit raised fundamental errors in the PTAB’s written decision, including the PTAB’s plainly erroneous claim construction and failure to consider the objective evidence in connection with the PTAB’s ultimate §103 determination.

At the oral argument, the Federal Circuit panel did not take issue with these fundamental defects in the PTAB’s decision. Instead, the panel spent the vast majority of its time exploring potential alternative grounds for affirming the PTAB, apart from the reasons stated by the PTAB itself – including arguments never previously raised by the parties or the PTAB, and also including potential 35 U.S.C. §112 claim indefiniteness issues that, by statute, are beyond the PTAB’s jurisdiction in an IPR. The day following oral argument, the Federal Circuit invoked FED. CIR. R. 36 to render judgment affirming the PTAB’s decision, but without providing an opinion to state the Federal Circuit’s reasons for affirmance.

LSI requested rehearing from the panel or *en banc* Federal Circuit, presenting essentially the same arguments raised in this petition. But the rehearing request was denied, also without a statement of the Federal Circuit’s reasons.

The issues presented in this petition will be moot if this Court, in *Oil States Energy Services, LLC v. Greene's Energy Group, LLC*, 639 Fed. App'x 639 (Fed. Cir. 2016), *cert. granted*, (U.S. June 12, 2017) (No. 16-712), decides that patent owners are entitled to a jury trial under the Seventh Amendment when their patent property rights are at stake.<sup>1</sup> But if the Court decides to the contrary, and affirms the constitutionality of allowing an administrative trial court to extinguish patent property rights, then the issues presented in this petition are of crucial importance to all U.S. patent stakeholders.<sup>2</sup> The Federal Circuit is the only avenue for appealing a PTAB decision that extinguishes a patent property right. But as the record of this case demonstrates like few others, the Federal Circuit's excessive invocation of Rule 36 in PTAB appeals serves to undermine the public's confidence that the Federal Circuit is providing meaningful and even-handed judicial review of the PTAB, but within the confines of the Federal Circuit's limited appellate jurisdiction to review patent validity decisions that the PTAB is authorized by statute to make in the first instance.

### OPINIONS AND ORDERS BELOW

The PTAB panel below issued one final written decision covering two consolidated IPR proceedings

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1. Because the PTAB opinion below should be vacated if the Court determines that IPR proceedings are unconstitutional because of the Seventh Amendment right to a jury trial, LSI requests the Court at least hold this petition until *Oil States* is decided, and vacate the opinion below if the Court so holds.

2. LSI respectfully requests the Court consider granting this petition so it can decide the issues raised herein as a companion case to the pending *Oil States* appeal.

coordinated with a third IPR proceeding. (App. 4a-5a). The PTAB decision is unreported but available at 2015 WL 5190544 (PTAB Sept. 3, 2015).

On a consolidated appeal of the PTAB decision and following briefing and oral argument by the parties, a three-judge panel of the Federal Circuit Court of Appeals issued a judgment affirming the PTAB decision without opinion, citing FED. CIR. R. 36 (“Rule 36”) (App. 1a). The panel opinion is unreported and available at 672 F. App’x 995 (Fed. Cir. Jan. 10, 2017). LSI requested *en banc* and panel rehearing, but the request was denied and is unreported. (App. 61a).

#### **STATEMENT OF JURISDICTION**

The present Petition for Writ of Certiorari is filed within ninety days of the denial of LSI’s Combined Petition for Rehearing *En Banc* and Panel Rehearing by the Federal Circuit on May 3, 2017. This Court has jurisdiction under 28 U.S.C. §§ 1254(1) and 2101(c) and Rule 13(1) of the Rules for the U.S. Supreme Court.

#### **CONSTITUTIONAL PROVISIONS, STATUTES AND REGULATIONS AT ISSUE IN THIS APPEAL**

The Fifth Amendment of the United States Constitution (U.S. CONST. amend. V) states in relevant part:

No person shall . . . be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.



Section 702 of the Administrative Procedure Act (5 U.S.C. §702) states in relevant part:

A person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action within the meaning of a relevant statute, is entitled to judicial review thereof.

Section 704 of the Administrative Procedure Act (5 U.S.C. §704) states in relevant part:

Agency action made reviewable by statute and final agency action for which there is no other adequate remedy in a court are subject to judicial review.

35 U.S.C. §318(a) states:

Final Written Decision - If an inter partes review is instituted and not dismissed under this chapter, the Patent Trial and Appeal Board shall issue a final written decision with respect to the patentability of any patent claim challenged by the petitioner and any new claim added under section 316(d).

35 U.S.C. §319 states:

A party dissatisfied with the final written decision of the Patent Trial and Appeal Board under section 318(a) may appeal the decision pursuant to sections 141 through 144. Any party to the inter partes review shall have the right to be a party to the appeal.

35 U.S.C. §144 states:

The United States Court of Appeals for the Federal Circuit shall review the decision from which an appeal is taken on the record before the Patent and Trademark Office. Upon its determination the court shall issue to the Director its mandate and opinion, which shall be entered of record in the Patent and Trademark Office and shall govern the further proceedings in the case.

Federal Circuit Rule 36 states:

Rule 36. Entry of Judgment – Judgment of Affirmance Without Opinion. The court may enter a judgment of affirmance without opinion, citing this rule, when it determines that any of the following conditions exist and an opinion would have no precedential value: (a) the judgment, decision, or order of the trial court appealed from is based on findings that are not clearly erroneous; (b) the evidence supporting the jury’s verdict is sufficient; (c) the record supports summary judgment, directed verdict, or judgment on the pleadings; (d) the decision of an administrative agency warrants affirmance under the standard of review in the statute authorizing the petition for review; or (e) a judgment or decision has been entered without an error of law.

## STATEMENT OF THE CASE

This is an appeal from a consolidated and coordinated IPR proceeding conducted before the PTAB that resulted in perhaps the largest testimonial and evidentiary record compiled to date at the PTAB. The record below features 24 declarations and 14 depositions, many from extraordinary scientists who testified based on their contemporaneous personal knowledge of: (1) the actual state of the art at the time of inventor David Furry's inventive activities; (2) Furry's success at solving an important technical problem that other skilled scientists had been unable to solve, despite coordinated and well-funded research efforts; and (3) the manner in which Furry and FLIR partnered to bring Furry's technical solution to market, copying Furry's novel camera design to create the GasFindIR hydrocarbon leak detection camera that had an immediate and lasting disruptive impact on LDAR in the petrochemical industry.

The case began<sup>3</sup> when FLIR filed five separate petitions for IPR with the PTAB challenging David Furry's two patents that are owned by his company, LSI.<sup>4</sup>

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3. Furry and FLIR were partners in creating the commercial market for passive-IR optical gas imaging cameras, as discussed below, before they were adversaries in litigation. (See A23979-23988; A23989-23999). Citations in the form (A \_\_\_\_ ) refer to the joint appendix before the Federal Circuit: *Leak Surveys, Inc. v. FLIR Systems, Inc.*, No. 2016-1299, -1300 (Fed. Cir.) (consolidated appeals).

4. Furry's then-existing company (Furry Brothers, LLC) and FLIR were in litigation at the end of their business partnership, with FLIR paying to settle their dispute and affirming Furry's full ownership of all intellectual property, including his still pending

The PTAB instituted three of the five IPR petitions for trial and denied institution of the others, consolidated two of the instituted petitions (IPR2014-00411 and IPR2014-00434) into one case (A391-394), and coordinated the third (IPR2015-00065) for all purposes with the other consolidated petitions (A27796-27815; App. 4a-5a). The PTAB held one oral argument to consider all three IPR petitions, and issued a consolidated written decision holding that all challenged claims were unpatentable as obvious under 35 U.S.C. §103. (App. 57a-59a).

On appeal, the Federal Circuit panel issued a “Rule 36” judgment affirming the decision of the PTAB without an opinion providing the reasons for affirmance. (App. 1a). LSI requested panel and *en banc* rehearing of the Rule 36 judgment. The Federal Circuit denied LSI’s request for rehearing, also without opinion. (App. 61a).

#### **A. The Evidentiary Record Compiled Below.**

The factual record of this case is so compelling because when FLIR filed IPR petitions to challenge Furry’s patents, many extraordinary scientists with personal knowledge of the relevant events stepped forward to offer factual testimony in support of Mr. Furry. These scientists did so because they each recall

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patent applications that later were assigned to LSI. (See A52, A102). LSI initiated the patent infringement dispute when it filed suit against FLIR for patent infringement on July 25, 2013 in the Northern District of Texas, where Furry resides and conducted his inventive activities. The case is active, but was stayed pending the outcome of the PTAB IPRs below and all appeals: *Leak Surveys, Inc. v. FLIR Systems, Inc.*, Case No. 3-13-cv-02897 in the United States District Court for the Northern District of Texas.

the petrochemical industry's extensive but failed efforts to develop an optical gas imaging system that could visualize hydrocarbon gas leaks under real-world field conditions with variable temperature and wind conditions.

Among the scientists working on this problem in the early-2000s, David Furry and his "Hawk camera" are famously remembered as having solved a technical problem the petrochemical industry itself could not solve. Several witnesses in this case – top scientists from the largest petroleum companies – described the day in 2004 when Furry brought his Hawk camera to the industry's "Scan Off" field test to compete against the industry's then-best optical gas leak detection systems.<sup>5</sup> These scientists, having dedicated years of work and countless resources to creating a commercially viable optical gas leak detection system, testified that they were surprised and astonished by the Hawk camera's unexpected results, and that it was immediately apparent Furry had solved an important technical problem that the petrochemical industry had been unable to solve. (A17620-23; A17627-29; A13542-49; A16126-31; A15526-31).

The remarkable factual record below consists of declaration and deposition testimony from the following key witnesses with personal knowledge:

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5. The API's extensive efforts, culminating in the "Scan Off," were documented in the "Environ Report." (A13387-619; A17614-22). The Environ Report is a critical document in this case for many reasons, including disclosing the petroleum industry's then state of the art survey of various ineffective optical gas imaging technologies that were, nevertheless, still used as prior art in the IPR proceedings. *See, e.g.*, A13542-49 (API's literature survey).

- Dr. Jeff Siegell and Wayne Sadik, former ExxonMobil employees. Siegell headed the API's LDAR group, and Sadik assisted. (A13389; A16108-10; A16135-39; A17007-08).
- Dr. Douglas Hausler (former Philips Petroleum) and Dave Fashimpaur (British Petroleum). Each played an active part in the API's LDAR initiative (A13389; A15496; A15537-43; A17612-14; A17635-40).
- Mike Smylie, an environmental consultant from Environ who was hired to design, implement, and document the API's "Scan Off" near Houston, Texas. (A13389; A17079-81; A17091-95).
- Barry Feldman, a former EPA employee charged with directing Smart LDAR research (A13389; A17055-56; A17066-69).
- Jeff Leake, an infrared camera dealer who has personal knowledge of David Furry's conception and reduction to practice activities, having assisted David in ordering the Hawk prototypes from Indigo. (A16675-80; A16683-95).
- Dr. William (Bill) Parrish, a well-known pioneer in infrared technologies. He was the founder of Amber Engineering (acquired by Raytheon) and a co-founder of Indigo (acquired by FLIR<sup>6</sup>),

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6. FLIR purchased Indigo in early 2004. Throughout this petition, references to activities of FLIR are also intended to include the activities of Indigo prior to FLIR's acquisition.

both of which developed infrared technologies for aerospace, commercial and military applications. Parrish personally oversaw the development and marketing of the Merlin-MID camera – the primary reference used by FLIR for each asserted ground of unpatentability, and the camera modified by David Furry into the “Hawk”. (A6979-80; A17521-23; A17531-17537).

- Dr. William Hossack, a co-author of the Strachan reference at issue in the IPR. (A2858; A15014-16; A15040-50).
- Dr. James T. Wimmers, author of a critical prior art reference considered during prosecution, who submitted a declaration to the examiner during prosecution. (A24305-09).
- Dr. Austin Richards, a long-time FLIR/Indigo employee who joined Indigo after the Merlin-MID was developed and worked under Dr. Bill Parrish. Dr. Richards currently is a senior scientist for FLIR. (A7936; A21588; A21591-92).
- Dr. James Woolaway, a co-founder of Indigo (along with Dr. Bill Parrish) who stayed with the company when it was acquired by FLIR, and served for many years as FLIR’s Chief Intellectual Property Officer prior to his retirement in 2010. Like Parrish, he was a lead designer of the Merlin-MID camera. (A8958-60).

In addition to these witnesses offering testimony based on personal knowledge, each side also offered

testimony from retained experts. (A20191-96; A20354-55; A20471-74) (LSI expert testimony); (A2787-88; A2847-51) (FLIR expert testimony).

**B. The Technical Problem Addressed by the Patents at Issue.**

In the petrochemical industry, “Leak Detection and Repair” or “LDAR” is the technical endeavor of locating and repairing hydrocarbon gas leaks. (A13376; A13409-10; A16114). In the 1980s, the United States Environmental Protection Agency (“EPA”) mandated “Method 21” as the required technology for petrochemical LDAR. (A13320; A16115-17). Method 21 relied upon hand-held “sniffers” that a technician would place in locations known to be a likely gas leak source. Method 21 was cumbersome, costly, very inefficient, and prone to false readings. (A86 1:42-58; A17615-17 ¶¶10-13; A17057-59 ¶¶12-18; A16115-17).

Beginning in the early 1990s, the petrochemical industry aggressively searched for an acceptable replacement to Method 21, led by a group of researchers who coordinated their efforts through the American Petroleum Institute (“API”), the EPA, and state environmental agencies. (A13409-11; A17617; A16119-22). They coined the term “Smart LDAR” to refer to the as-yet unknown solution. (A16117 ¶29).

In 1999, the EPA commissioned a study to investigate potential technology platforms for Smart LDAR as a potential alternative work practice to Method 21. (A13409-11). The EPA and API were willing to consider any potential technology. (A13411-13).



The LDAR technical problem being addressed by the petroleum industry at that time is the exact same technical problem addressed by the patents at issue.<sup>7</sup> A comparison of the “Background” section of the patents with the industry’s Environ Report summary of the “Scan-Off” field trial conclusively demonstrates this. (*Compare* A86 1:30-2:33 *with* A13395-96 and A13409-25. *See also* A16117-22; A17617-18).

It is undisputed that several known prior art optical gas imaging systems prior to 2004 were capable of imaging a hydrocarbon gas under *some* conditions - in particular, when there was a sufficiently large “Delta-T,” (*i.e.*, a large difference in temperature between the gas being imaged and the ambient atmospheric background). (A86 1:59-2:25; A17524-25 ¶¶12; A6995-96 38:23-39:4; A22488-89; A20249-53, A20259-60 ¶¶136-146,157-158; A13542-49). Thus, the technical problem being addressed in the early 2000’s by the petrochemical industry and Furry was the problem of further developing these known prior art imaging systems to make them suitable for field use under the real-world conditions at petrochemical facilities, where ambient conditions such as temperature and wind are uncontrolled and *variable*. (*See* A13423 (“One of the basic questions evaluated in this study is whether gas-imaging devices can be used to effectively detect fugitive emissions under conditions typically found in refineries and chemical plants.”); A16125-16129 ¶¶50,52,64; A17624 ¶30; A86 2:23-25 (“Hence, a need exists for a way to

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7. At this time, Furry was the operations manager for Brady, Texas, which owned a 42-mile hydrocarbon transmission line and several miles of gathering lines. His job responsibilities included the detection of fugitive gas leaks from these pipeline facilities. (A13372-73).

perform a visual inspection to find leaks with reliability and accuracy, while being faster and more cost effective than existing leak survey methods.”))

**C. Furry’s Novel Technical Solution, the “Hawk” Camera, Solves the Technical Problem.**

Furry’s novel and patented optical gas leak-detection system relies upon principles of infrared (“IR”) imaging. *See generally* LSI Fed. Cir. Op. Br. at 15-20 (Mar. 9, 2016). IR imaging is founded upon the basic physics principal that all objects above absolute zero temperature both emit and absorb electromagnetic radiation. *See id.* at 15.

*Emission spectroscopy* is a type of IR imaging that relies upon detecting amounts of IR radiation *emitted* by an object compared to its background or surroundings due to differences in the temperature of the object versus the background or surrounding objects. Emission spectroscopy enables “thermal imaging” devices (such as the Merlin-MID camera that Furry modified to create his invention) to be used for applications such as night-vision and surveillance. To perform most effectively, emission spectroscopy instruments must be optimized to avoid absorption of IR radiation by naturally occurring atmospheric gases. For this reason, thermal imaging devices based on emission spectroscopy are outfitted with a “wide” optical filter typically having a filter passband of 2000nm or more. Additionally, a thermal imaging camera’s filter typically has a passband centered at a portion of the IR spectrum (termed a “window”) that is known to be relatively *free of absorption* caused by naturally occurring atmospheric gases. *See id.* at 17-18.

*Absorption spectroscopy*, on the other hand, is a different principle of operation for IR imaging. Rather than seeking to avoid absorption of IR radiation by atmospheric gases, absorption spectroscopy identifies the absence of expected IR radiation at very narrow and specific IR wavelengths. The expected IR radiation will be absent if particular gases of interest are present in the scene being imaged, thus absorbing IR radiation at the known narrow wavelengths. By detecting absorption (rather than avoiding it, as in emission spectroscopy), absorption spectroscopy can be used to produce a visible image of a leaking gas against its background scene. *See id.* at 18-20.

In a nutshell, Furry's modification of the Merlin-MID camera (discussed below) replaced the Merlin's wide passband (2000nm) filter with a narrow passband (100-200nm<sup>8</sup>) filter, and in doing so changed the basic principal of operation of the device from emission spectroscopy to absorption spectroscopy. *See id.* at 62-66.

Absorption spectroscopy is more difficult when the background ambient temperature is variable. (A20259). Absorption spectroscopy relies upon a thermal contrast (*i.e.*, Delta-T) between the molecule of interest and the

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8. Furry's original Hawk cameras were outfitted with an approximate 100nm passband filter. (A22301). Each of the patent claims at issue contain a limitation that expressly imposes a lower limit on the width of the filter passband ("at least about 100nm" or "at least about 200nm.") (*See, e.g.*, A99, A149). The parties dispute whether the required-results limitations in the claims (such as "provide a visible image of the gas leak under variable ambient conditions of the area around the leak") imposes a practical upper limit on the passband width for the claimed invention.

background. The smaller the Delta-T, the more difficult gas is to detect. (A7001-4 44:15-47:8; A20258-60 ¶¶156-158; A13542-13549). Under real-world conditions and where gas concentrations are low, however, the Delta-T will often be very small. (A20296 ¶239). For this reason, research to improve absorption-based IR instruments for field applications such as LDAR have long focused on successful detection of molecules under conditions with a minimal Delta-T and/or where Delta-T cannot be controlled. (A13542-49).

Furry's prototype "Hawk" camera (the disclosed preferred embodiment in the patent specification) was a modified and custom-built Merlin-MID camera, with a novel filter configuration designed by Furry. (A88-89 5:34-6:64, 7:59-8:29). The Hawk camera embodied at least two critical design decisions: (1) the filter specification, which consisted of a fixed, single filter configuration having a carefully selected narrow width (*i.e.*, aggregate passband) and center wavelength; and (2) placement of the single filter configuration inside the refrigerated portion of the camera, in the same portion as the infrared detector. (*Id.*; A20204-07 ¶¶46-52).

The first design decision – filter configuration – was a product of Furry's desire to detect multiple gases of interest (*i.e.*, typical light hydrocarbons that leak in a chemical plant) with a single camera using a single filter configuration. (A89 8:30-52). Furry realized that the major hydrocarbons of interest for LDAR (such as methane, ethane, propane, butane and hexane) each have respective absorption spectra that tend to overlap at specific and fairly narrow bandwidths. (A89-90 8:30-9:12 and A60-62 Figures 5, 6 and 7 (overlying the respective absorption

bands of multiple gases of interest to show overlap)). Because of this physical property (the overlapping absorption bands for hydrocarbons of interest), Furry realized that a single narrow filter could be used to detect IR absorption by the potential presence of multiple gases of interest. *Id.* (showing that the passband of the filter depicted by transmission curve 80, overlaps with the absorption band for multiple gases of interest)). Furry also realized, however, that the filter's passband width could not be too wide or else the visible image would "wash out" due to excess IR radiation detected from IR wavelengths outside the absorption bands of interest. *See generally* LSI Fed. Cir. Op. Br. at 21-22.

Furry's second design decision – placing the single filter configuration inside the refrigerated portion of the camera – was made to minimize IR radiation emitted by the filter itself, which otherwise would interfere with the detection of IR absorption within the specific wavelengths of interest. (A88-89 5:34-6:64; A20204-7 ¶¶46-52).

Furry's Hawk camera soon proved to be the first optical imaging device capable of reliably imaging and detecting hydrocarbon gases under a full range of variable ambient conditions such as temperature and wind speed. Even prior to the "Scan Off," Furry had started a business to survey petrochemical facilities for leaks, using a Hawk camera mounted to a helicopter. (A13373; A17565; A24247). His company was the only one to offer LDAR services using an optical imaging device at the time. (A16131 ¶69).

The Hawk's true coming-out party, however, occurred at the API's "Scan Off" field trials in early 2004, where the

Hawk competed against the industry's then-best solutions and demonstrated that David Furry had solved a technical problem that others had been unable to solve. (A13396; A17619-22). The Hawk camera had the lowest detection threshold (*i.e.*, could see leaks smaller than the others), and demonstrated a 100% success rate for leaks above the detection threshold (*i.e.*, an ability to successfully image *every* leak above the threshold, with no false positives). (A13505). Each of the other tested systems missed some leaks falling above the camera's own detection threshold, and some of the competing systems also suffered from false positive results. (*Id.*; A17621-23; A16127-31 ¶¶54-64, 70).

The scientists coordinating and participating in the "Scan Off" immediately appreciated the significance and implication of the Hawk's demonstrated results. David Furry had solved the technical problem of adapting an imaging device for real-world LDAR, when the entire petrochemical industry had been unable to do so. (A16130 ¶65 ("Those of us on the API team studying the problem for numerous years thought, 'This is the best thing we've ever seen!'""); A15529-30 ¶¶137,142-146; A17620-17622 ¶¶23,26; A17628 ¶43; A6996-6998; 7020-7022; A7035-7039).

#### **D. The Patents at Issue.**

Furry filed three provisional patent applications prior to his participation in the "Scan Off," the first of which was filed on June 11, 2003. (A52). He filed a PCT application on April 26, 2004. (*Id.*) His patent application spent almost nine years in prosecution (including an appeal to the Board of Patent Appeals and Interferences ("BPAI") before Congress in 2012 converted the BPAI into what is now the PTAB). (A13378-85).

Finally, on June 5, 2012, Furry's first patent issued as U.S. Patent No. 8,193,496 ("496 Patent") (A52-101). Furry later secured issuance of a second patent (U.S. Patent No. 8,426,813 ("813 Patent") that issued on April 23, 2013 as a continuation of the '496 Patent. (A102-151). All claims of the '496 Patent are method claims, with Claim 1 being representative; and all claims of the '813 Patent are apparatus claims, with Claim 1 being representative.

For both the '496 and '813 Patents, each independent claim contains a limitation that requires a certain result – namely, that the claimed camera system be capable of producing a visible image of a gas leak under “variable ambient conditions of the area around the leak.”<sup>9</sup> This limitation on each claim challenged in IPR is critical to

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9. Each of the independent claims contains limitations concerning “variable ambient conditions” or “normal operating conditions” or both. There is some variation in claim language, but in each instance these terms are used to describe the conditions of the area around the leak. The following claim elements are representative:

- “filtering an infrared image associated with the area of the gas leak under normal operating and ambient conditions for the component” and “electronically processing the filtered infrared image . . . to provide a visible image of the gas leak under variable ambient conditions of the area around the leak” and “visually detecting the leak based on the visible image under the variable ambient conditions.” (A99-100 28:64-29:8) ('496 Patent Claim 1, emphasis added)
- “a processor that can process a signal representing the filtered infrared image . . . to produce a visible image of the chemical emanating from the component under variable ambient conditions of the area around the leak.” (A149 28:63-67) ('813 Patent Claim 1, emphasis added)

this petition for certiorari because (as discussed below) the PTAB literally eliminated the word “variable” from each of the claims before finding that each patented claim was unpatentable as obvious under 35 U.S.C. §103.

In short, the “variable ambient conditions” limitation requires that the claimed camera be capable of solving the technical problem that Furry confronted during his inventive activities – namely, that the claimed invention be capable of producing a visible image of a gas leak under normal operating and *variable* (*i.e.*, real-world) ambient conditions, including low Delta-T conditions that are frequently present in real world conditions around pipelines and petrochemical equipment. (A24218; A24230-31). The “variable ambient conditions” limitation was added during prosecution of the ’96 Patent specifically to distinguish the claimed invention from prior art imaging systems that could image a leaking gas only under a limited range of ambient atmospheric conditions (such as high Delta-T), thus making these prior art systems unsuitable for real-world LDAR applications in a commercial petrochemical setting. (A24272-73; A24282-87).

As can be seen, the “variable ambient conditions” language added to the claims by amendment during patent prosecution is intrinsically tied to the technical problem addressed simultaneously by Furry and the API. The “variable ambient conditions” language limits the scope of the claims to encompass only those systems that are capable of solving the technical problem by being capable of imaging gas leaks under the variable ambient conditions that exist in uncontrolled, real-world environments.



**E. The PTAB’s Final Written Decision Strikes the Word “Variable” from the Patent Claims.**

In both its institution decision and in its final written decision, the PTAB “construed” the claims at issue by striking the word “variable” from the claims altogether.

In its institution decision, the PTAB construed the claim term “produce a visible image of the chemical emanating from the component under variable ambient conditions of the area around the leak” as follows:

On the record before us, we find that “produce a visible image of the chemical emanating from the component under variable ambient conditions of the area around the leak” means “being able to produce a visible image under the ambient conditions of the area around the leak.” Ambient conditions can vary depending, *inter alia*, on the weather.

(A371).

LSI urged the PTAB to correct this error in its Patent Owner Response and at the oral argument, but the PTAB’s final written decision contains the same gross claim construction error, simply striking the word “variable” from the claim language altogether:

On the full record, we maintain our constructions of “produce a visible image of the chemical emanating from the component under variable ambient conditions of the area around the leak” as meaning “being able to produce a visible image under the ambient conditions of the area around the leak.”

(App. 19a).

The Board’s comparison of the claims to the prior art made clear that the Board had eliminated the “variable” requirement from the claims, finding that the prior art, which was already known to be insufficient to solve the technical problem the petroleum industry was attempting to solve, satisfies this claim element if the prior system was capable of imaging a gas leak under *any two* ambient conditions (*e.g.*, a one-degree change in atmospheric temperature). In assessing the Strachan prior art reference, the Board substituted the word “various” for the claim term “variable” in its discussion. (*See* A32 (“We find that Strachan discloses that practical quality images of hydrocarbon gas can be obtained at *various* temperatures.”) (emphasis added)).

In addition, the PTAB’s decision uses this plainly erroneous claim construction, which struck the critical word “variable” from the claims, as its sole justification for refusing to consider the compelling “objective indicia” of non-obviousness and the compelling, actual state of the art disclosed by the numerous, unbiased fact witnesses. (*See* App. 50a (refusing to consider objective evidence because “the challenged claims do not recite or require any specific conditions. Indeed, the challenged claims require imaging of known or unknown gases under ‘some’ operating conditions.”)).

#### **F. The Federal Circuit’s “Rule 36” Judgment Without Opinion.**

Despite the egregious claim construction and other errors in the PTAB’s written decision, the morning after oral argument the Federal Circuit panel issued a Rule 36 judgment affirming the PTAB’s decision without providing

an opinion to state the panel's reasons for affirmance. (App. 1a). LSI filed a request for *en banc* and panel rehearing, which the Federal Circuit also denied without opinion. (App. 61a).

### **REASONS FOR GRANTING THE PETITION**

#### **A. The Federal Circuit's Frequent Use of Rule 36 in PTAB Appeals Calls Into Question the Integrity of the Judicial Process.**

In this petition, LSI presents jurisdictional, constitutional, and statutory points of error that arise directly from the Federal Circuit's Rule 36 judgment itself, and that can only be corrected by this Court. The issues presented in this petition are of vital and immediate interest to all stakeholders in the U.S. patent system, given the PTAB's recent prominence in U.S. patent law and the Federal Circuit's role as the only reviewing Article III court in the vast majority of PTAB cases.

A prominent patent law commentator, considering the Federal Circuit's Rule 36 practices as exemplified by the present case, has gone so far as saying: "By using Rule 36 in nearly 50% of cases, and specifically in this [Leak Surveys] case, the Federal Circuit seems to be unnecessarily calling into question the *integrity of the judicial process*." Gene Quinn & Peter Harter, *Does the Federal Circuit's Use of Rule 36 Call Into Question Integrity of the Judicial Process?*, IPWATCHDOG (Feb. 14, 2017), <http://www.ipwatchdog.com/2017/02/14/federal-circuit-rule-36-integrity-judicial-process/id=78261> (emphasis added).

As a result, the integrity of the U.S. patent system is called into question as well. LSI urges this Court to grant this petition and provide meaningful guidance to the Federal Circuit regarding the constitutional and statutory limits on its authority to invoke Rule 36 in the context of PTAB appeals.

When the Federal Circuit sits in review of an IPR decision of the PTAB, it sits as a court of limited appellate jurisdiction. On appeal from a decision following an IPR administrative trial that is expressly authorized by statute, the Federal Circuit’s administrative appellate jurisdiction is limited to reviewing the sufficiency of the PTAB’s stated reasons for its decision, using the standards of review that are established by the Administrative Procedure Act (“APA”). *See S.E.C. v. Chenery Corp.*, 318 U.S. 80, 87 (1943). *See also* 5 U.S.C. §706. If the PTAB’s stated reasons are sufficient, the Federal Circuit must affirm; and if the PTAB’s stated reasons are not sufficient, the Federal Circuit must vacate or reverse. *See Power Integrations, Inc. v. Lee*, 797 F.3d 1318, 1326 (Fed. Cir. 2015) (“[O]ur review of a patentability determination is confined to the grounds upon which the Board actually relied. . . . We have no warrant to accept appellate counsel’s *post hoc* rationalizations for agency action . . . or to supply a reasoned justification for an agency decision that the agency itself has not given.”) (internal quotes and citations omitted).<sup>10</sup>

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10. FLIR’s IPR petitions below challenged the patents only on grounds of 35 U.S.C. §103 obviousness, which is a legal conclusion premised on underlying fact determinations. LSI’s discussion in this petition is limited to PTAB appeals involving §103 issues. There may be some issues in PTAB trials that are not applicable here, such as pure legal issues unrelated to patentability, for which the Federal Circuit could find harmless error or affirm on alternative grounds.

This limitation on Federal Circuit appellate jurisdiction in IPR appeals is derived from constitutional separation of powers principles. When Congress enacted the America Invents Act and created the PTAB and IPR administrative trials, Congress expressly authorized the PTAB to determine issues of patent validity in the first instance. *See* 35 U.S.C. §311, *et seq.* The PTAB's validity decisions are final – subject only to Article III judicial review as allowed by statute or as required by the constitution, *and no more.* *See Chenery*, 318 U.S. at 87; *see also* 5 U.S.C. §706.

The Federal Circuit exceeds the scope of its limited role within this constitutional balance when it substitutes its own reasoning for the PTAB's, on an issue (patent validity) the Federal Circuit is not authorized by statute to decide in the first instance – rather than confining its review to the sufficiency of the PTAB's own stated reasons for the decision.

By invoking Rule 36, it is far too easy for a Federal Circuit panel to obscure the fact that it is affirming a PTAB decision for reasons that are separate and apart from the PTAB's own stated reasons. When Rule 36 is invoked, the patent owner in most cases will be unable to show that the panel has exceeded its limited appellate jurisdiction by substituting its own reasons for that of the PTAB. Precisely because Rule 36 judgments do not state the Federal Circuit's reasons for affirming, the *en banc* Federal Circuit and this Court rarely have an opportunity to scrutinize whether the Federal Circuit has exceeded the limits of its appellate jurisdiction in a particular case.

Apart from the constitutional separation of powers issues at stake, the Federal Circuit's use of Rule 36 is of immediate practical importance to U.S. patent stakeholders. It is well-known that the PTAB extinguishes patents and patent claims at a statistically alarming rate. See Steve Brachmann & Gene Quinn, *Are More Than 90 Percent of Patents Challenged at the PTAB Defective?*, IPWATCHDOG (Jun. 14, 2017) <http://www.ipwatchdog.com/2017/06/14/90-percent-patents-challenged-ptab-defective/id=84343/>. It is equally well-known that the Federal Circuit is invoking Rule 36 in PTAB appeals at an accelerated rate – affirming without opinion in more than fifty percent of all PTAB appeals, in recent years. See Christina Violante, *Law360's Federal Circuit Snapshot: By the Numbers*, LAW360 (Mar. 1, 2017), <https://www.law360.com/articles/894751/law360-s-federal-circuit-snapshot-by-the-numbers>.

When important patent property rights are at stake in an administrative trial, there is a strong presumption that the administrative decision will be subject to Article III judicial review. See, e.g., *Bowen v. Michigan Acad. of Family Physicians*, 476 U.S. 667, 670-73 (1986); see also 5 U.S.C. §§702, 704, 706. Yet, the Federal Circuit's Rule 36 judgments provide no assurance that the Federal Circuit has conducted meaningful and even-handed judicial review of PTAB decisions that take private property by extinguishing patent rights.<sup>11</sup>

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11. Even if the Court determines in *Oil States* that a patent is a public right for Seventh Amendment purposes, a patent is nonetheless a property right such that its owner is entitled to due process before the property right is taken. See 35 U.S.C. § 261; see also *Cleveland Bd. of Educ. v. Loudermill*, 470 U.S. 532, 541-42 (1985).

When the Federal Circuit affirms the PTAB under Rule 36 without stating its reasons, the constitutional due process rights of patent owners may also be implicated. If the Federal Circuit affirms for reasons other than those stated by the PTAB, patent owners may be deprived of basic due process notice of the issues being considered by the Federal Circuit, and may be denied an opportunity to address the issues with evidence and legal arguments. This is particularly so when the Federal Circuit's alternative reasons for affirmance are presented for the first time on appeal, or perhaps even for the first time during the appellate oral argument by the Federal Circuit panel itself. The due process and statutory violations are compounded if the Federal Circuit affirms for a reason such as claim indefiniteness under 35 U.S.C. §112 – an issue that the PTAB itself is precluded from considering under the IPR statutes. *See Cuozzo Speed Tech's, LLC v. Lee*, 136 S.Ct. 2131, 2141-42 (2016) (noting that the PTAB acts outside its statutory jurisdiction if it cancels a patent claim for indefiniteness under §112 in IPR).

The American Invents Act created the PTAB and the IPR process to address a crisis in U.S. patent quality that has its roots in the PTO's own examination practices. *See, e.g.*, H.R. Rep. No. 112-98, at 38-40 (2011) (legislative history). Congress created the PTAB and IPRs for dual purposes: as efficient alternatives to district court litigation for a party seeking to challenge an issued patent, and also as a mechanism for the PTO to take a “second look” at previously-allowed patent grants. *See Cuozzo*, 136 S.Ct. at 2143-44. The final IPR statutory scheme is the result of legislative compromises that seek to balance the interests of various patent stakeholders. *See Joe Matal, A Guide to the Legislative History of the America Invents Act: Part II of II*, 21 FED. CIR. B.J. 539 (2012).

To achieve these legislative aims while still balancing the interests of patent stakeholders, the IPR statutes only permit the PTAB to consider a limited subset of patent validity issues, and the PTAB is required to conduct IPR proceedings on strict statutory deadlines. *See* 35 U.S.C. §311(b), §314(b), and §316(a)(11). To further streamline the process, Congress eliminated intra-agency appeals (which had been part of the prior *inter partes* reexamination statutes), and authorized direct appeal from the PTAB to the Federal Circuit. *See* 35 U.S.C. §141(e), §319.<sup>12</sup>

The Federal Circuit upends the AIA’s careful legislative balance any time it oversteps its appellate jurisdiction and substitute’s its own judgment for the PTAB’s. The Federal Circuit’s frequent invocation of Rule 36 in PTAB appeals creates an appearance that this happens at least occasionally, if not frequently. But the present case presents a rare factual and procedural record demonstrating that it almost certainly has happened here. The Court should grant this petition and provide guidance to the Federal Circuit on the constitutional and statutory limits of its authority to issue Rule 36 affirmances without opinion in PTAB appeals.

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12. The purpose of this change was to get cases to the Federal Circuit faster, for ultimate resolution. *See* 157 Cong. Rec. S1376 (Mar. 8, 2011) (statement of Senator Kyl) (“By reducing two levels of appeal to just one, [the elimination of intra-agency appeal] will substantially accelerate the resolution of inter partes cases.”).



**B. Because the PTAB’s Written Decision Below is Premised on a Plain and Egregious Claim Construction Error, the Federal Circuit Necessarily Exceeded its Appellate Jurisdiction by Affirming for Other Reasons.**

As discussed above, the PTAB’s written decision below rests entirely on a “claim construction” that *literally strikes* the most important word from each challenged claim – the word “variable” which was added during prosecution to distinguish the claimed invention from the prior art. The PTAB used this egregious claim construction error as it compared the scope of the claimed invention to the alleged combination of prior art references; and it used the claim construction error as its excuse for casting aside the compelling factual record of objective evidence showing non-obviousness.<sup>13</sup>

There is no such thing as a “harmless” claim construction error in PTAB appeals involving §103 issues. To date, in every such appeal in which the Federal Circuit has found error in the PTAB’s claim construction, the PTAB decision has been reversed or vacated. *See, e.g., Straight Path IP Group, Inc. v. Sipnet EU S.R.O.*, 806 F.3d 1356, 1357 (Fed. Cir. 2015); *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1295 (Fed. Cir. 2015). This is true because the PTAB’s claim construction, which determines the scope of the patent claim, necessarily guides the next steps in the PTAB’s §103 analysis – comparing the

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13. It should come as no surprise that the PTAB found the claims invalid over the prior art after striking a word that was added to the claims to distinguish over the same prior art. Once the PTAB stuck the word “variable” from the claims, its invalidity decision was a *fait accompli*.

claims as construed to the prior art, and assessing the relationship (“nexus”) between the claims as construed and any objective evidence of non-obviousness.

Thus, in a case such as this one where the PTAB’s stated reasons are so plainly erroneous, the Federal Circuit necessarily has affirmed the decision for alternative reasons. This is *a priori* proof that the Federal Circuit has exceeded the bounds of its limited appellate jurisdiction, and has substituted its own judgment for the PTAB’s, rather than confining itself to a review of the PTAB’s stated reasons.

Article III courts must steadfastly protect the boundaries of their own jurisdiction. Only this Court can step in to ensure that the Federal Circuit does so in PTAB appeals, even in cases where the Federal Circuit invokes Rule 36 to affirm without opinion. At a minimum, LSI asks this Court to grant this petition, vacate the Federal Circuit’s Rule 36 judgment, and require the Federal Circuit to write an opinion stating its reasons for affirmance of the PTAB decision below. Under these circumstances, the only way for this Court to ensure that the Federal Circuit has not overstepped its jurisdictional limits is to require the Federal Circuit to state its reasons for affirming the PTAB decision below.

**C. The Federal Circuit Violated LSI's Constitutional Due Process Rights by Considering New Arguments on Appeal, Including Arguments on Claim Indefiniteness that are Outside the PTAB's Statutory Jurisdiction.**

At the Federal Circuit oral argument<sup>14</sup>, LSI's counsel began by asserting that the PTAB's decision could not be affirmed on its own stated reasons because it is premised on egregious claim construction errors and other errors. (*See* App. D, Arg. at 0:51 – 2:19). Throughout the argument, the panel did not disagree with these assertions. *See generally* Comb. Pet. for Reh'g *En Banc* and Panel Reh'g at 7-9 (Feb. 9, 2017). Instead, the panel's questions to LSI's counsel were related almost exclusively to issues that had not been briefed by the parties, and that were unrelated to the PTAB's stated reasons for its decision. (*See generally id.* at 11-15).

First, the panel questioned LSI extensively about the meaning and implication of certain dependent claims (particularly claim 37 of the '813 Patent)<sup>15</sup> that expressly state a numeric upper limit on the filter passband size. (*See* App. D, Arg. at 3:24-47; 6:12-57; 9:49 – 11:21; 33:19 – 34:46). The PTAB's final written decision did not discuss

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14. An audio recording of the Federal Circuit Oral Argument is provided as Appendix D. Citations to the recording ("Arg.") refer to the time stamp (minute:second) of the audio recording.

15. The court began its questioning by referring to "claim 18 of the '496" Patent. (*See* App. D, Arg. at 3:25-33). This was a mistake. The '496 Patent does not contain any independent or dependent claim limitation that places a numerical upper limit on the filter's passband width.

these dependent claims at all, or draw any inferences from them. But at oral argument the panel repeatedly pressed LSI's counsel on whether FLIR could meet its burden of proof to show that its proposed combination of prior art meets the "variable ambient conditions" limitation merely by pointing to certain dependent claims in the patents. *See* Comb. Pet. for Reh'g *En Banc* and Panel Reh'g at 10-13. Not only was this argument not relied upon by the PTAB, but it had never been made by FLIR in the PTAB or in FLIR's appeal briefs. The argument was presented for the first time in this case by the Federal Circuit panel itself, during oral argument. *Id.*

Second, during oral argument the Federal Circuit panel openly expressed concern that LSI's claims might be indefinite because the claims do not expressly state a numerical upper limit on the filter passband width. (*See* App. D, Arg. at 36:07-23). Indeed, much of the panel's questioning throughout the argument focused on whether a precise numeric upper limit can be discerned from the claim language. (*See, e.g., id.* at 6:00 – 6:57; 9:37 – 10:03; 12:23 – 13:25; 13:53 – 14:30; 33:55 – 34:46; 36:07-42). But claim indefiniteness is an issue that is beyond the statutory jurisdiction of the PTAB in IPR. *See Cuozzo*, 136 S.Ct. at 2141-42 (2016). LSI did not present argument on indefiniteness in the IPR proceedings below because it was not at issue.<sup>16</sup>

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16. Prior to FLIR filing the first of its IPRs below, FLIR raised indefiniteness issues as part of the claim construction process in district court, and LSI responded with expert testimony. LSI had no reason to cite this evidence to the PTAB or Federal Circuit below because indefiniteness is not at issue in IPR.

Under these circumstances, LSI respectfully contends that it is entitled to an opinion from the Federal Circuit explaining the reasons for affirmance. The plain errors in the PTAB's stated reasons, coupled with the Federal Circuit's interest in new and alternative reasons for affirmance at oral argument, provide strong reasons to conclude that LSI's due process rights have been violated here. The Federal Circuit Rule 36 judgment below should be vacated, because only an opinion stating the Federal Circuit's reasons for affirmance can show otherwise.

**D. The Supreme Court Should Consider Whether the Federal Circuit May Ever Invoke Rule 36 to Affirm Without Opinion in a PTAB Appeal.**

“Showing your work” is an essential component of the scientific method. Scientific research cannot be verified and confirmed through the process of publication and peer-review unless those who perform the research show their work (*e.g.*, disclosing research methods, facts, data and results) in a transparent manner. In the PTAB, the testimony of scientific or technical experts is afforded no weight unless all facts and data supporting the expert's testimony are fully disclosed. *See* 37 C.F.R. §42.65.

Administrative law imposes a similar requirement by requiring agencies to “show their work” in a written opinion. Administrative courts that conduct formal administrative trials (such as the PTAB) are required to provide a written statement of their reasons for decision. The requirement of a written decision serves two purposes: to permit judicial review by an Article III court, and also to prevent the Article III reviewing court from intruding on the factual, policy, or discretionary decisions

that have been committed to the agency by statute. *See PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 992-93 (Fed. Cir. 2017) (citing *Chenery*, 318 U.S. at 88).

The Federal Circuit's frequent use of Rule 36 to avoid stating the reasons it is affirming a PTAB decision is an abdication of the principles of transparency and accountability that underlie both the scientific method and administrative law. Article I, Section 8, Clause 8 of the U.S. Constitution authorizes Congress to establish a patent system to "promote the progress of science and the useful arts." In 1981, Congress established the Federal Circuit, *inter alia*, to promote consistency in the application of the patent laws. *See generally* Christopher A. Cotropia, "Arising Under" *Jurisdiction and Uniformity in Patent Law*, 9 MICH. TELECOMM. & TECH. L. REV., 253, 259-61 (2003) (discussing legislative history). The Federal Circuit fails to fulfill its own legislative purpose when its panels so frequently shield their reasoning from the scrutiny of future panels, the *en banc* court, this Court, and legal scholars.

The IPR statutes give reason for this Court to conclude that Congress intended for the Federal Circuit to provide a written statement of its reasons for decision in every PTAB appeal:

The United States Court of Appeals for the Federal Circuit shall review the decision from which an appeal is taken on the record before the Patent and Trademark Office. Upon its determination the court shall issue to the Director its mandate *and opinion*, which shall be entered of record in the Patent and

Trademark Office and shall govern the further proceedings in the case.

35 U.S.C. §144 (emphasis added). *See also* Dennis Crouch, *Wrongly Affirmed Without Opinion*, WAKE FOREST LAW REVIEW, 52 (2017), Univ. of Missouri School of Law L. Stud. Research Paper No. 2017-02.

When valuable patent rights are at stake, there is a strong presumption that any decision of the PTAB will be subjected to judicial review by an Article III court. *See supra* fn. 11. In most IPR cases, the Federal Circuit is the only Article III court that will review the PTAB's decision. When the Federal Circuit invokes Rule 36 and does not state the reasons it is affirming the PTAB, patent owners are left to wonder whether they have received the meaningful but limited judicial review to which they are entitled. Section 144 thus can and should be read as expressing the intent of Congress that every patent owner is entitled to an *opinion* from an Article III court before the patent owner's patent rights are taken and extinguished by an administrative trial court, without a jury trial.

**CONCLUSION**

For the foregoing reasons, this petition should be granted.

Respectfully submitted,

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August 1, 2017



## **APPENDIX**

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**APPENDIX A — JUDGMENT OF THE UNITED  
STATES COURT OF APPEALS FOR THE  
FEDERAL CIRCUIT, FILED JANUARY 10, 2017**

UNITED STATES COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT

2016-1299, 2016-1300

LEAK SURVEYS, INC.,

*Appellant,*

v.

FLIR SYSTEMS, INC.,

*Appellee.*

Appeals from the United States Patent and Trademark  
Office, Patent Trial and Appeal Board in Nos. IPR2014-  
00411, IPR2014-00434, IPR2015-00065.

**JUDGMENT**

THIS CAUSE having been heard and considered, it is

ORDERED and ADJUDGED:

PER CURIAM (O'MALLEY, BRYSON, and REYNA, *Circuit  
Judges*).

**AFFIRMED. See Fed. Cir. R. 36.**

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*Appendix A*

ENTERED BY ORDER OF THE COURT

January 10, 2017  
Date

/s/ Peter R. Marksteiner  
Peter R. Marksteiner  
Clerk of Court

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**APPENDIX B — FINAL DECISION OF THE  
UNITED STATES PATENT AND TRADEMARK  
OFFICE, DATED SEPTEMBER 3, 2015**

UNITED STATES PATENT  
AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL  
AND APPEAL BOARD

FLIR SYSTEMS, INC.,

*Petitioner,*

v.

LEAK SURVEYS, INC.,

*Patent Owner.*

Case IPR2014-00411/434 (Patents 8,426,813 B2  
and 8,193,496 B2)  
Case IPR2015-00065 (Patent 8,426,813 B2)

Before FRED E. McKELVEY, JAMES T. MOORE,  
and TREVOR M. JEFFERSON, *Administrative Patent  
Judges.*

JEFFERSON, *Administrative Patent Judge.*

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

*Appendix B*

## I. INTRODUCTION

*A. Background*

FLIR Systems, Inc. (“Petitioner” or “FLIR”) filed four petitions seeking *inter partes* review of U.S. Patent No. 8,426,813 B2 (“the ’813 patent”) and U.S. Patent No. 8,193,496 B2 (“the ’496 patent”). Filed were a first petition in IPR20 14-00411 (“IPR ’411”) and a second petition in IPR2014-00608 (“IPR ’608”) seeking *inter partes* review of claims 1-58 (all of the claims) of the ’813 patent. 35 U.S.C. § 311; Paper 2 (IPR ’411); Paper 2 (IPR ’608).<sup>1</sup> Also filed were a third petition in IPR2014-00434 (“IPR ’434”) and a fourth petition in IPR2014-00609 (“IPR ’609”) seeking *inter partes* review of claims 1-7 and 9-20 the ’496 patent. 35 U.S.C. § 311; Paper 2 (IPR ’434); Paper 2 (IPR ’609).

Leak Surveys, Inc. (“Patent Owner” or “LSI”) filed a Patent Owner’s Preliminary Response in IPR ’411 (Paper 6 corrected by Paper 8); IPR ’608 (Paper 6 corrected by Paper 8); IPR ’434 (Paper 6); and IPR ’609 (Paper 7).

In a consolidated Decision to Institute (Paper 9 in IPR ’411 and Paper 9 in IPR ’434, “Dec. ’411”), we denied institution in IPR ’608 and IPR ’609 and in IPR ’411 and IPR ’434 instituted this proceeding as to claims 1-22, 31, 37-40, 42-56, and 58 of the ’813 patent and claims 1-7 and 9-20 of the ’496 patent. Dec. ’411, 35-36. Subsequently, we consolidated IPR2014-00434 with IPR20 14-00411 and terminated the IPR20 14-00434 proceeding. Paper 10 (IPR ’411); Paper 9 (IPR ’434).

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1. The IPR in parentheses after a paper number or exhibit number indicates the IPR docket that contains the numbered filing.

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In IPR2015-00065 (“IPR ’065”), FLIR filed a fifth petition, requesting *inter partes* review of claims 23-30, 32-36, 41, and 57 of the ’813 patent pursuant to 35 U.S.C. §§ 311-319. Paper 2 (IPR ’065). FLIR subsequently withdrew claim 29 from the requested *inter partes* review, thus challenging only claims 23-28, 30, 32-36, 41, and 57 of the ’813 patent. Paper 10 (IPR ’065). LSI filed a Preliminary Response in two parts, Part 1 (Paper 8 (IPR ’065)) and Part 2 (Paper 16 (IPR ’065)).

Pursuant to 35 U.S.C. § 314, in our Decision to Institute (Paper 25, “Dec. ’065”), we instituted *inter partes* review as to claims 23-28, 30, 32-36, 41, and 57 of the ’813 patent. Dec. ’065, 18-19. We further combined IPR2014-00411 with IPR2015-00065 for purposes of scheduling, briefing, and trial. Paper 28, 7 (IPR ’065).

LSI filed a Patent Owner Response as to all IPRs (Paper 65 (IPR ’411), Paper 37 (IPR ’065), “PO Resp.”) and FLIR filed a Reply to the Patent Owner Response (Paper 77 (IPR ’411), Paper 42 (IPR ’065), “Reply”).<sup>2</sup> A consolidated oral hearing for IPR2014-00411 and IPR2015-00065 (Paper 70 in IPR ’065 and Paper 112 in IPR ’411, “Tr.”) was held on July 2, 2015.

For the reasons that follow, we determine that FLIR has shown by a preponderance of the evidence that claims 1-28 and 30-58 of the ’813 patent and claims 1-7 and 9-20 of the ’496 patent, are unpatentable.

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2. All references herein to the Patent Owner Response (PO Resp.) are to the redacted Paper 66 (IPR ’411) and Paper 37 (IPR ’065).

*Appendix B**B. Related Cases*

FLIR states that the '813 patent, which claims priority to the '496 patent, has been asserted by LSI in *Leak Surveys, Inc. v. FLIR Systems, Inc.*, Civil Action No. 3:13-CV-02897-L (N.D. Tex.) (filed July 25, 2013). Paper 2, 1 (IPR '411); Paper 4, 2 (IPR '065).

*C. The Asserted Grounds*

In the consolidated IPRs, we instituted trial on the grounds that the following cited references<sup>3</sup> render the challenged claims unpatentable as obvious pursuant to 35 U.S.C. § 103(a):

References	IPR	Claim(s)Challenged
Merlin Brochure <sup>4</sup> and Strachan <sup>5</sup>	IPR '411	'813 Patent: 1-4, 6, 8-22, 31, 37-40, 42-56, 58

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3. Exhibit numbers herein refer to exhibits filed in both IPR '411 and IPR '065 that share the same number. An exhibit number followed by a specific IPR in parentheses denotes an exhibit filed in the identified IPR.

4. Indigo Systems Corporation, Merlin: The ultimate combination of flexibility and value in high-performance Infrared Cameras (Rev. A 1/02), dated ©2002 (Ex. 1007, "Merlin Brochure").

5. D.C. Strachan et al., *Imaging of Hydrocarbon Vapours and Gases by Infrared Thermography*, 18 J. PHYS. E: SCI. INSTRUM. 492-498 (1995) (Ex. 1008, "Strachan").

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Merlin Brochure, Strachan, and Piety <sup>6</sup>	IPR '411	'813 Patent: 5 and 7
Merlin Brochure and Strachan	IPR '434	'496 Patent: 1-5 and 9-20
Merlin Brochure, Strachan, and Brengman <sup>7</sup>	IPR '434	'496 Patent: 6
Merlin Brochure, Strachan, and Hart <sup>8</sup>	IPR '434	'496 Patent: 7
Merlin Brochure and Strachan	IPR '065	'813 Patent: 23, 25, 28, 30
Merlin Brochure, Strachan, and Spectrogon <sup>9</sup>	IPR '065	'813 Patent: 27, 32-35, 41

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6. U.S. Patent No. 5,386,117 issued on January 31, 1995 (Ex. 1018, "Piety").

7. U.S. Patent No. 3,662,171 issued on May 9, 1972 (Ex. 1013 (IPR '434), "Brengman").

8. U.S. Patent No. 6,056,449 issued on May 2, 2000 (Ex. 1014 (IPR '434), "Hart").

9. Spectrogon Catalog of Bandpass Filters (<http://www.spectrogon.com/bandpass.html> dated October 6, 2001) (Ex. 1017, "Spectrogon").



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Merlin Brochure, Strachan, and OCLI <sup>10</sup>	IPR '065	'813 Patent: 24, 26, 36, 57
Merlin User's Guide <sup>11</sup> and Kulp <sup>12</sup>	IPR '065	'813 Patent: 23, 33, 35
Merlin User's Guide, Kulp, and Spectrogon	IPR '065	'813 Patent: 25, 27, 28, 30, 32, 34, 41
Merlin User's Guide, Kulp, and OCLI	IPR '065	'813 Patent: 24, 26, 36, 57

## D. The '813 Patent and Illustrative Claims

The '813 patent is based on an application which is a continuation of the application that matured into the '496 patent. Ex. 1001, 1:6-9.<sup>13</sup> The '813 patent relates to an infrared (IR) camera system which can be used to visually detect and identify chemical, gas, and petroleum product leaks. Ex. 1001, 1:27-29, 28:44-67.

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10. OPTICAL COATING LABORATORY, INC. SPECTRABAND STOCK PRODUCTS CATALOG, Vol. 5 (1994) (Ex. 1014, "OCLI").

11. Indigo Systems Corporation, MERLIN™ MID, InSb MWIR CAMERA, User's Guide, Version 1.10, 414-0001-10 (Ex. 1011, "Merlin User's Guide").

12. Thomas J. Kulp et al., *Remote Imaging of Controlled Gas Release using Active and Passive Infrared Imaging Systems*, 3061 SPIE 269 (1997) (Ex. 1012, "Kulp").

13. Ex. 1001 refers to the '813 patent filed in both IPR '411 and IPR '065.

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The '813 invention is readily understood by reference to its drawings and exemplary claims 1, 23, and 24. Figs. 1 and 2 of the '813 patent are reproduced below.

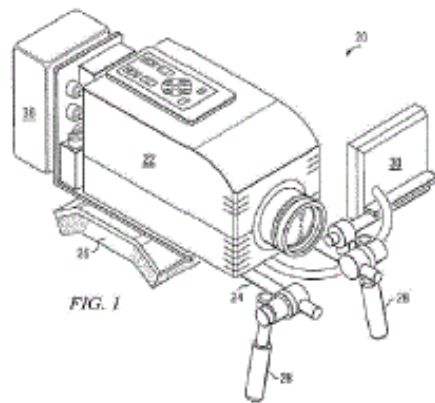


Fig. 1 depicts a perspective view of a chemical leak detection system

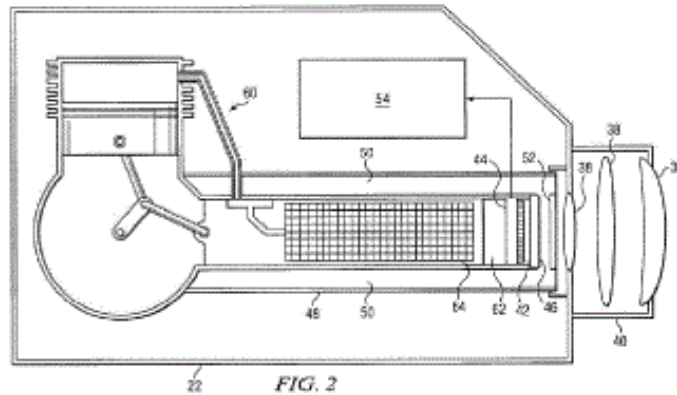


Fig. 2 depicts a schematic of an infrared camera system of Fig. 1

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Figures 1 and 2 show infrared camera system 22, lens assembly 40, and lens 38. Ex. 1001, 5:34-38. Camera system 22 has refrigerated portion 42 cooled by refrigeration system 60. *Id.* at 5:34-41, 5:66-67. The refrigerated portion 42 also comprises infrared sensor device 44 and optical bandpass filter 46. *Id.* at 5:41-43. The refrigeration cools optical bandpass filter 46, reducing the background noise of bandpass filter 46 as perceived by infrared sensor device 44. *Id.* at 6:45-47. Optical bandpass filter 46 is located along an optical path between lens 38 and infrared sensor device 44. *Id.* at 5:41-43. At least part of a pass band for optical bandpass filter 46 is within an absorption band for the detected chemical. The infrared image of the detected chemical passes through the lens and optical bandpass filter and the filtered infrared image of the leak is received with the infrared sensor device. *Id.* at 3:4-11. The visible image of the leak is produced by processing the filtered infrared image received by the infrared sensor device. *Id.*

Independent claim 1 and dependent claims 23 and 24 are illustrative of the claimed subject matter of the '813 patent.

1. A system for producing a visible image of a leak of any one or more chemicals of a group of chemicals, the leak emanating from a component, including:

- a passive infrared camera system including:

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a lens assembly including a lens;

a refrigerated portion including an interior;

an infrared sensor device located in the interior of the refrigerated portion;

a single filter configuration located in the interior of the refrigerated portion and including an optical bandpass filter fixed along an optical path between the lens assembly and the infrared sensor device;

a refrigeration system that can cool the interior of the refrigerated portion;

wherein at least part of the pass band for the single filter configuration is within an absorption band for each of the chemicals; and

wherein the aggregate pass band for the single filter configuration is at least about 100 nm; and

a processor that can process a signal representing the filtered infrared image captured by the infrared sensor device to produce a visible image of

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the chemical emanating from the component under variable ambient conditions of the area around the leak.

23. The system of claim 1, wherein the aggregate pass band for the single filter configuration is at least about 200 nm.

24. The system of claim 1, wherein the pass band for the filter configuration has a center wavelength located between about 3375 nm and about 3385 nm.

Ex. 1001, 28:44-67, 30:3-7.

*E. The '496 Patent and Illustrative Claim*

The '496 patent relates to a method of using an IR camera system to visually detect and identify chemical, gas, and petroleum product leaks. Ex. 1001, 1:25-27, 28:41-29:8.<sup>14</sup> The drawings and written description portion of the Specification of the '496 patent are essentially the same as the drawings and written description portion of the Specification of the '813 patent. *Compare* Ex. 1001 (IPR '434) *with* Ex. 1001.

Claim 1 is illustrative of the subject matter of the '496 patent.

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14. Ex. 1001 (IPR '434) refers to the '496 patent filed in IPR '434.

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1. A method of visually detecting a gas leak of any one or more chemicals of a group of predetermined chemicals, the gas leak emanating from a component of a group of components in different locations, the method comprising:

aiming a passive infrared camera system towards the component, wherein the passive infrared camera system comprises:

a lens,

a refrigerated portion defined by the interior of a Dewar flask, the refrigerated portion comprising therein:

an infrared sensor device; and

a single filter configuration comprising at least one fixed optical bandpass filter, each filter fixed along an optical path between the lens and the infrared sensor device, wherein at least part of the aggregate pass band for the single filter configuration is within an absorption band for each of the predetermined chemicals and

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wherein the aggregate pass band for the single filter configuration is at least about 200 nm; and

a refrigeration system adapted to cool the refrigerated portion, the refrigeration system comprising a closed-cycle Stirling cryocooler;

filtering an infrared image associated with the area of the gas leak under normal operating and ambient conditions for the component with the at least one optical bandpass filter;

receiving the filtered infrared image of the gas leak with the infrared sensor device;

electronically processing the filtered infrared image received by the infrared sensor device to provide a visible image of the gas leak under variable ambient conditions of the area around the leak; and

visually detecting the leak based on the visible image under the variable ambient conditions.

Ex. 1001 (IPR '434), 28:40-29:8.

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## II. ANALYSIS

*A. Claim Construction*

The Board interprets claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.P.R. § 42.100(b); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1278-79 (Fed. Cir. 2015). Claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

*1. “leak”*

In the preliminary Decision to Institute, we found that “leak” is broad enough to include both fugitive and non-fugitive emissions. Dec. ’411, 17. Thus, on the preliminary record we agreed with FLIR that “leak” should be defined as any chemical emission including (1) an unwanted (“fugitive”) chemical emission and (2) a known (“non-fugitive”) chemical emission, such as a chemical gas emission from an exhaust outlet of an airplane or a smokestack. Paper 2, 12 (IPR ’411); Paper 2, 10 (IPR ’434); Paper 2, 12-13 (IPR ’065). We found that the ’813 patent states that “[a]n embodiment of the present invention may be used to inspect any of a wide variety of components having [a] chemical ... of interest ... , including (but not limited to) a pipe, a compressor, ... a flare, an exhaust outlet, ... [or] a vent for a blow-off valve.” Ex. 1001, 12:17-25.



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LSI disagrees with our preliminary construction and argues that the construction of “leak” deviates from the ordinary meaning of the term. PO Resp. 31-33. LSI relies on extrinsic evidence to support its contention that the ordinary meaning of “leak” as recited in the ’813 and ’496 patents is limited to unintended or fugitive emissions. PO Resp. 33. LSI’s contention fails to recognize and distinguish the express teaching that chemicals of interest from flares, exhausts, vents or blow off valves are expressly described as uses of the claimed invention. Ex. 1001, 12: 17-25. Indeed, one portion of the specification that LSI relies on to distinguish known versus unknown emissions, indicates that the invention is used to survey known emissions of gas from vents. Ex. 1001, 20:28-31; *see* PO Resp. 34.

Although LSI admits that exhaust valves and flares will have known emissions and that the invention is used to survey these structures (PO Resp. 32), LSI argues that the term “leak” does not include the known emissions from these structures, as the ordinary use of the term is limited to fugitive or unknown emissions. We disagree, concluding that a person of ordinary skill in the art would understand that the specification describes a chemical of interest that is present in valves and exhausts that have known emissions. Ex. 1001, 12:22, 20:28-32.<sup>15</sup>

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15. In addition, we note that LSI’s claims using the term “leak” were rejected over intended or known emissions from a smokestack. *See* Ex. 1002, 319, 416-419. Patent Owner disputed and overcame the Examiner’s rejection on different grounds, but did not dispute the Examiner’s application of smokestack emissions to gas leaks. *See id.* Thus, at least during prosecution, the term leak was determined by the Examiner to include known emissions.

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Under the broadest reasonable interpretation, LSI's extrinsic evidence does not persuade us that a person of ordinary skill in the art would understand that "leak" as used in the specification and claims is limited to only unknown or fugitive emissions. Accordingly, on the full record, we maintain our construction of "leak" as including both fugitive and non-fugitive emissions.

2. *"produce a visible image of the chemical emanating from the component under variable ambient conditions of the area around the leak"*

In the Decision to Institute, we preliminarily construed "produce a visible image of the chemical emanating from the component under variable ambient conditions of the area around the leak" means "being able to produce a visible image under the ambient conditions of the area around the leak." Dec. '411, 17-18. LSI does not dispute this construction, but instead argues that

POSITA [i.e., a person having ordinary skill in the art,] would understand this claim limitation to require that the claimed invention be capable of operating under a full range of normal operating conditions, such as different temperatures or sunlight; and it would not encompass prior art systems that could image gases only within a narrow range of field conditions, such as temperature.

PO Resp. 27. Specifically, LSI argues that "in the context of the full claims, this limitation should be construed to

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mean that an infringing method must operate to image gas leaks under real-world field conditions, without taking steps to artificially control any variables such as background temperature, wind, etc.” *Id.* at 25. LSI does not provide any argument or evidence that the patent describes the range of “real-world” versus “artificially controlled” conditions. Instead, LSI’s construction merely seeks to eliminate any conditions obtained in a lab or test setting from ambient conditions in other settings.

We are not persuaded that the patent claims’ references to variable ambient conditions are limited to “real-world” conditions. As we previously noted, a person having ordinary skill in the art would understand that the claimed system and method would typically be used outdoors, where environmental conditions change, at the point where a leak may occur. Dec. ’411, 18. For example, in the summer, a chemical of interest may be present at higher temperature than the same chemical of interest in the winter. *Id.* Similarly, exhaust temperature may vary depending on conditions.

LSI admits that “the claim does not specify what the normal operating conditions would be” under given circumstances. Oral Argument Transcript (“Tr.”) 62:23-24. LSI also admits that a smokestack, for example, would have “a different range of normal operating conditions.” Tr. 63:6-8. Because these conditions vary and the ’813 and ’496 patent specifications are silent on the range or limits of normal operating conditions, we are not persuaded by LSI’s attempt to exclude controlled environments from the claimed ambient conditions. *See* PO Resp. 26-27.

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We find no support for LSI's contention that "variable ambient conditions" or "normal operating in variable ambient conditions" is limited to those instances that are not constrained or controlled in some artificial manner. *Id.*

On the full record, we maintain our constructions of "produce a visible image of the chemical emanating from the component under variable ambient conditions of the area around the leak" as meaning "being able to produce a visible image under the ambient conditions of the area around the leak."

*B. Asserted Prior Art**1. Merlin Brochure (Ex. 1007)*

The Merlin Brochure discloses a mid-wavelength (MWIR) infrared camera ("Merlin-MID") that includes an infrared sensor device (InSb focal plane array) and a 3-5  $\mu\text{m}$  bandpass cold filter within a refrigeration portion defined by the interior of a Dewar flask. Ex. 1007, 3, 6; *see* Ex. 1011, 1. The Merlin-MID also includes a refrigeration system (a closed-cycle Stirling cryocooler) that cools the refrigeration portion of the Merlin-MID and the filter. Ex. 1007, 6.

The '813 patent states that "[a] preferred infrared camera system 22, for example, for use in an embodiment of the present invention is a Merlin<sup>™</sup> mid-wavelength infrared (MWIR) high-performance camera available from Indigo Systems, Inc. in California." Ex. 1001, 6:19-23. The Merlin-MID camera described in the brochure is the

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Merlin MWIR camera discussed in the '813 patent. Ex. 1001, at [56] (citing Merlin Brochure by Indigo Systems Corp. (2002)), 6:19-23 (citing Merlin mid-wavelength infrared MWIR camera as the preferred embodiment of camera system 22).

*2. Merlin User's Guide (Ex. 1011)*

The Merlin User's Guide describes features of the Merlin Brochure MID InSb camera. The Merlin User's Guide discloses a passive infrared camera with a refrigeration portion including an interior. Ex. 1011, 2, 51. Merlin User's Guide describes both a cold filter and infrared sensor device located in the interior of the refrigeration portion. *Id.* at 51.

The Merlin User's Guide states:

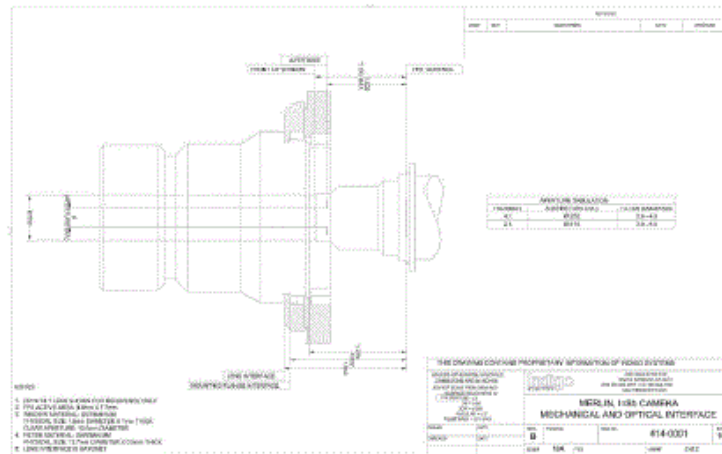
Merlin Mid is a mid-wavelength infrared (MWIR) high-performance camera offered by Indigo systems Corp. The camera consists of a Stirling-cooled Indium Antimonide (InSb) Focal Plane Array (FPA) built on an Indigo Systems ISC9705 Readout Integrated Circuit (ROIC) using indium bump technology. The FPA is a 320 x 256 matrix or 'staring' array of detectors that are sensitive in the 1.0  $\mu\text{m}$  to 5.4  $\mu\text{m}$  range. The standard camera configuration incorporates a cold filter that restricts the camera's spectral response to the 3.0-5.0 micron band. The FPA is enclosed in an all-metal evacuated [D]ewar assembly cooled by a closed-

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cycle Stirling cryocooler, and is thermally stabilized at a temperature of 77 K.

Ex. 1011, 1. “The lens-to-camera interface is shown in Appendix B” (Ex. 1011, 3) reproduced below.



Depicted above is the Merlin InSb camera, mechanical and optical interface.

The filter is located in the general area of the “aperture” and the filter bandpass is identified as 3.6 to 4.9 or 3.0 to 5.0 depending on the aperture diameter. Ex. 1101, 51. The IR sensor is located in the general area identified as FP A (focal point array) sensor. The refrigerated area is the space between the filter and the IR sensor.

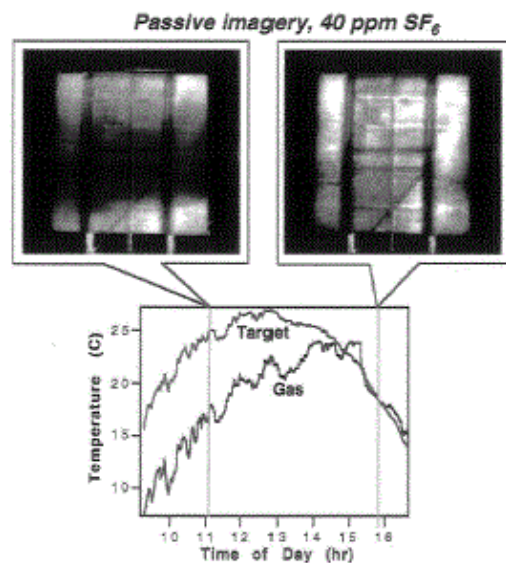
*3. Kulp (Ex. 1012)*

Kulp discloses “results of field tests of an active backscatter absorption gas imaging (BAGI) system and a

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passive imager on a Ga:Si infrared focal-plane array.” Ex. 1012, 269 (Abstract). The passive imager on an infrared focal-plane array “images gases through temperature or emissivity differences.” *Id.*

Specifically, Kulp discloses a camera equipped with a narrow bandpass cold filter to detect sulfur hexafluoride (SF<sub>6</sub>) gas. Ex. 1012, 270. Figure 2 of Kulp shows that the cold filter has an aggregate passband of about 570 nm between wavenumber 920 (about 10870 nm) and wavenumber 970 (about 10300 nm). *Id.* at 270 (Figure 2). In addition, Figure 9 of Kulp shows that the Ga:Si passive infrared camera provides a visible image of the SF<sub>6</sub> gas at different times of day at different temperatures. *Id.* at 277. Figure 9 is depicted below.



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Figure 9 shows passive images collected of gas releases at two different times of the day. The graph plots the target and air temperature during the day. *Id.* Kulp states that “[the passive IR approaches] are attractive because of its unlimited range and spectral bandwidth, and its simplicity .... Its use must, however, be accompanied by the assumption that the required temperature and/or emissivity differences between the gas and background will always exist.” Ex. 1012, 277.

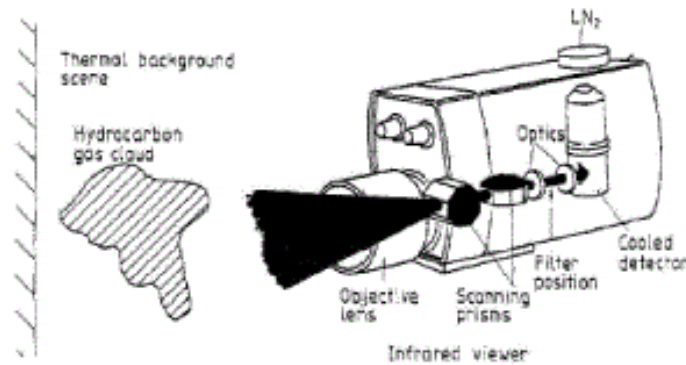
*4. Strachan (Ex. 1 008)*

Strachan discloses a demonstration of “an infrared imaging technique for the visualization of hydrocarbon gases and vapours.” Ex. 1008, 1 (Abstract). Strachan describes “a qualitative imaging approach to gas/vapour detection.” *Id.* at 1 (Section 1). Strachan states:

The technique is based on real-time infrared imaging (thermography), which produces images of objects from their own infrared heat radiation. By selecting spectral absorption windows characteristic of hydrocarbon vapours and gases it is possible to visualise such gases against a background thermal scene. The approach and its limitations in terms of hydrocarbon detection and instrument development requirements for ambient temperature operations are discussed.

*Id.* Figure 3 shows the schematic of a hydrocarbon imaging system disclosed in Strachan.



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“Figure 3 indicates schematically the operation of a hydrocarbon detection system.” Ex. 1008, 493. Figure 3 shows “a detector is housed in its own Dewar flask, which contains a small quantity of liquid nitrogen coolant. Infrared radiation from the source object is imaged by a multi-element lens, generally silicon or germanium.” Ex. 1008, 493. Strachan states:

The detector signal is then processed electronically to produce a real-time infrared television picture or thermogram. . . . The camera views the thermal background scene around and through any intervening hydrocarbon cloud. Providing background and cloud are not in total thermal equilibrium with each other, then it is possible to visualise the gas cloud against the background.

*Id.* Strachan disclosed an infrared imaging system fitted with a specific filter for detecting hydrocarbon

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gases, discussing two different example filters, having bandwidths centered approximately at  $3.4 \mu\text{m}$ , for detecting hydrocarbon gases. *Id.* Furthermore, Strachan discloses the use catalogs of infrared absorption spectra for various hydrocarbon vapors. *Id.*

*5. Hart (Ex. 1014 (IPR '434))*

Hart is a U.S. patent, issued on May 2, 2000, titled "Frame Assembly For Supporting A Camera." Figure 1 of Hart is reproduced below.

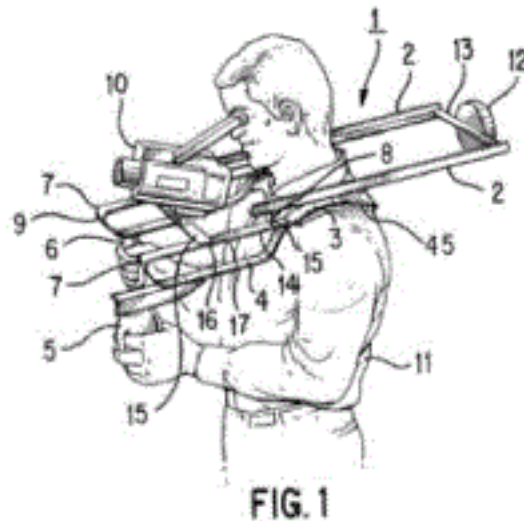


Figure 1 of Hart shows a camera supported by a frame assembly that includes frame 4, 7, shoulder rest 3, and handle 5, 6 extending from the frame. Ex. 1014 (IPR '434), 4:41-45, 52-55, 5:24-25. Figure 1 of Hart also discloses that aiming the camera towards a component is performed by a person holding the infrared camera system.

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*6. Spectrogon (Ex. 1017) and OCLI (Ex. 1014)*

Spectrogon shows a catalog of bandpass filters available at the time of the invention. Ex. 1017. The Optical Coating Laboratory, Inc. (“OCLI”) products catalog likewise discloses a catalog of optical filters available at the time of invention. Ex. 1014.

*7. Piety (Ex. 1018)*

Piety is a U.S. patent issued in 1995, titled “Infrared Thermography System Including Mobile Unit,” and discloses a mobile infrared thermography unit that includes a data processing device operable to record user notes. Ex. 1018, 14: 18-22. Specifically, Piety discloses:

The mobile infrared thermography unit includes an infrared camera, a storage device such as a videotape recorder for at least recording thermographic images captured by the infrared camera, and a mobile unit computer. The mobile unit computer includes a touch screen display for presenting information to a thermographer and for receiving data and command inputs from the thermographer.

Ex. 1018, Abstract ll. 4-11.

*8. Brengman (Ex. 1013 (IPR '434))*

Brengman is a U.S. patent that issued in 1972, titled “Methane Gas Detection System Using Infrared.”

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Brengman discloses using an infrared gas detection system mounted on an airborne platform to detect methane gas leaks in buried gas pipelines. Ex. 1013 (IPR '434), 1:70-72, 4:12-15. Brengman further discloses that the airborne platform may be a helicopter. *Id.* at 7:38-40.

*C. Merlin References as Prior Art  
and Printed Publication*

FLIR contends that the Merlin Brochure (Ex. 1007) is a prior art printed publication. Paper 2, 10 (IPR '65); Paper 2, 8-9 (IPR '411). At the time of filing the Response, LSI contested whether the Merlin Brochure is publicly available prior art. PO Resp. 70-73. At oral argument, LSI withdrew its argument that the Merlin Brochure was not publicly available. Tr. 40:1-9 (stating that LSI no longer contends that the Merlin Brochure was not publicly available).

With respect to the Merlin User's Guide (Ex. 1011), FLIR argues that testimony evidence shows that the guide was distributed with sales of the Merlin camera. Ex. 1016 ¶ 7 (stating that "[t]he Merlin User's Guide is a user guide that describes the Merlin-MID camera sold by Indigo" and "distributed to customers with the Merlin-MID camera").

LSI argues that because the Merlin User's Guide was only delivered to purchasers of the expensive Merlin MID camera (citing Ex. 2063 at LSI0000483, LSI0000816, LSI0000853), it was not available such that ordinarily skilled artisans could locate it by exercising reasonable

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diligence. See *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004). LSI further argues that publications that are available only at high costs render the document effectively inaccessible to members of the general public. PO Resp. 70 (citing *Virginia Innovation Scis., Inc. v. Samsung Elecs. Co.*, 983 F. Supp. 2d 713, 738 (E.D. Va. 2014)). We note that LSI acknowledges that a Merlin user's guide with the same title as the Merlin User's Guide (Ex. 1011) was previously considered during prosecution. PO Resp. 73. LSI also acknowledges that FLIR's witnesses state the Merlin User's Guide (Ex. 1011) was available to purchasers of the Merlin MID as of the critical date. PO Resp. 71. Despite this evidence of public availability, LSI argues that the guide was only available to purchasers of the camera and the expense of buying the camera means the Merlin User's Guide (Ex. 1011) is not a printed publication freely accessible to the public prior to the critical date. PO Resp. 71 (citing *Virginia Innovation*, 983 F. Supp. 2d at 738).

We are not persuaded by LSI's arguments. The case LSI relies on, *Virginia Innovation*, is neither binding authority nor persuasive authority. The facts in *Virginia Innovation* can be distinguished from the facts of the present case, as the prior art in question in *Virginia Innovation* was not sufficiently shown to be generally on sale to the interested public, and was instead "restricted" to members of a publishing organization, which required membership dues for access. See 983 F. Supp. 2d at 737-38. Indeed, the district court in *Virginia Innovation* noted that there was no evidence that the document was available for sale to the general public outside of

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the publishing organization members. *Id.* In the present case, no membership fee or organization membership is required for access to the Merlin User's Guide, which testimony shows was available and sold to the interested public as early as late 2000. *See* Ex. 1026 ¶¶ 17-19; Ex. 1024 ¶¶ 12-14; Ex. 1016 ¶ 12.

Based on the complete record, we find by a preponderance of the evidence that distribution of the Merlin User's Guide with the sale of the Merlin MID camera shows sufficient public accessibility and distribution. The cost to obtain the camera does not negate the evidence that the camera and accompanying user's guide was available to the interested public. The testimony evidence shows that the Merlin User's Guide was available for sale and distribution to the interested as early as 2000. Thus, FLIR has shown by a preponderance of the evidence that the Merlin User's Guide was a publicly available printed publication.

*D. Level of Ordinary Skill in the Art*

FLIR contends that a person of ordinary skill in the art would have relevant experience with passive IR (infrared) systems in addition to the requisite engineering or physics education. Paper 2, 10-11 (IPR '065); Reply 19-20. LSI contends that in addition to the requisite physics or optical science/engineering education a person of ordinary skill the art would have experience developing IR camera systems generally. PO Resp. 22. LSI's contention is that FLIR's definition of a person of ordinary skill is too narrowly focused on passive IR systems and is evidence of hindsight bias. PO Resp. 23.

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LSI's arguments are contradictory and confusing; asserting not only that FLIR's person of ordinary skill in art is overly narrow and defined as a "specialist in the ['813 and '496 patents'] specific solution to the problem being solved," but also that FLIR's artisan "would not [] have been familiar with the technical problem being addressed by the invention." PO Resp. 22 (emphasis omitted). Regardless, FLIR argues that the invention would have been obvious under either FLIR's or LSI's proposed person of ordinary skill in the art. Reply 20.

Based on the full record, we find that the level of ordinary skill in the art is evidenced by the prior art references and the type of problems and solutions described in the '813 and '496 patents (Ex. 1001, 1:25-2:34), and includes experience in imaging of chemical gases using IR camera systems generally in addition to the requisite engineering, physics or optical science education. *See In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Moreover, and apart from any differences of opinion between FLIR and LSI on the precise background and knowledge of one skilled in the art, the prior art itself is highly indicative of the level of skill. *See id.* ("the level of ordinary skill in the art . . . was best determined by appeal to the references of record"). In any event, we do not find that a person of ordinary skill's understanding of the teachings of the prior art would differ if an ordinarily skilled artisan possessed knowledge of both active and passive IR systems rather than knowledge of passive IR systems alone. *See* PO Resp. 22-24.

*Appendix B**E. Obviousness of the Challenged Claims*

FLIR contends that the combinations of the Merlin Brochure, the Merlin User's Guide, Kulp, Strachan, Piety, Spectrogon, and OCLI render claims 1-28 and 30-58 of the '813 patent unpatentable based on obviousness. For the reasons given below, after consideration of the Petition, the arguments in the Patent Owner Response, and the evidence of record, we conclude that FLIR has shown by a preponderance of the evidence that each of claims 1-28 and 30-58 of the '813 patent is unpatentable as obvious.

FLIR also contends that the Merlin Brochure and Strachan render claims 1-5 and 9-20 of the '496 patent unpatentable as obvious. Paper 2, 14-48 (IPR '434). FLIR asserts that dependent claim 6, which depends from claim 1, is rendered unpatentable as obvious by Brengman, the Merlin Brochure and Strachan. *Id.* at 48-50. Finally, FLIR contends that dependent claim 7, which depends from claim 1, is rendered unpatentable as obvious by Hart, the Merlin Brochure, and Strachan. *Id.* at 50-51.

For the reasons that follow, we find by a preponderance of the evidence that FLIR has demonstrated that the challenged claims, claims 1-28 and 30-58 of the '813 patent and claims 1-7 and 9-20 of the '496 patent, are unpatentable as obvious.

*1. Petitioner's '813 Patent Contentions*

FLIR asserts that claims 1-4, 6, 8-22, 31, 37-40, 42-56, and 58 are unpatentable under 35 U.S.C. § 103(a)



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over the Merlin Brochure (Ex. 1007) and Strachan (Ex. 1008). Paper 2, 9, 34 (IPR '411). FLIR also asserts dependent claims 5 and 7, which depend from claim 1, are unpatentable under 35 U.S.C. § 103(a) over the Merlin Brochure (Ex. 1007), Strachan (Ex. 1008), and Piety (Ex. 1018). Paper 2, 9, 54 (IPR '411).

FLIR provides claim charts and citations to the Declaration testimony of Dr. Jonas Sandsten (Ex. 1 006) supporting its contention that it would have been obvious to combine the Merlin Brochure and Strachan to yield the camera of the claims. *Id.* at 34-40, 41-53. FLIR asserts that “[i]t would have been an obvious design choice to one skilled in the art to replace the standard 3-5  $\mu\text{m}$  filter [disclosed in the Merlin Brochure] with a narrower filter that covers hydrocarbon gases of interest” disclosed in Strachan as a combination of known elements that yield predictable results. *Id.* at 34.

FLIR argues that the claimed camera is nothing more than the result of equipping Petitioner’s own Merlin-MID camera disclosed in the Merlin Brochure with a custom filter selected to monitor gas as disclosed in Strachan. Paper 2, 34 (IPR '411). For example, FLIR contends that the Merlin Brochure discloses a passive infrared camera that includes a refrigeration system (a closed-cycle Stirling cryocooler) that contains a standard 3-5  $\mu\text{m}$  cold filter within the interior of a Dewar flask, and an infrared sensor device (InSb focal plane array). *Id.* at 35. FLIR contends Strachan’s disclosure of the absorption band for multiple hydrocarbon gases and the selection of an appropriate filter to detect multiple gases, discloses

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the “the pass band for the single filter configuration” limitation of claim 1. *Id.* at 42-43. Indeed, FLIR further asserts that Strachan discloses that it was known to use catalogs of infrared absorption spectra for gases to select filters for use in an infrared camera with a narrow bandpass filter to monitor and detect hydrocarbon gas and vapor. *Id.* at 36; *see* Ex. 1008, 492-493. FLIR argues that

Strachan shows that at the time of the alleged invention, it was known in the art to select a filter that covers the absorption band of more than one gas of interest and to use the selected filter in a passive infrared camera to detect leaks of the gases of interest.

Paper 2, 37 (IPR '411); Ex. 1006 ¶ 80.

With respect to independent claim 1 of the '813 patent, FLIR shows that the Merlin Brochure discloses a camera for detecting gas, wherein the Merlin Brochure discloses “a single filter configuration” in the bandpass filter (cold filter) that is less than 200 nm. Paper 2, 20-31 (IPR '411) (citing Ex. 1007, 3). FLIR further alleges that Strachan discloses the absorption of various hydrocarbon gases and the selection of filters for such detection. Paper 2, 37 (IPR '411) (citing Ex. 1008, 493). In addition, FLIR asserts that the Merlin Brochure and Strachan disclose producing visual images of gas detected at various ambient conditions and temperatures. Paper 2, 40 (IPR '411) (citing Ex. 1006 ¶ 74; Ex. 1008, 492; Ex. 1007, 3).

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In IPR '065, FLIR asserts that claims 23, 25, 28, and 30, which depend from independent claim 1, are unpatentable as obvious over the Merlin Brochure (Ex. 1007) and Strachan (Ex. 1008). Paper 2, 17-26 (claim 1), 26-28 (claims 23, 25, 28, and 30). In support of its contentions, FLIR provides claim charts and citations to Dr. Sandsten's testimony (Ex. 1006). *Id.*

FLIR also contends that claims 23, 33, and 35, which depend from independent claim 1, are unpatentable as obvious in view of Kulp (Ex. 1012) and Merlin User's Guide (Ex. 1011). Paper 2, 41-48 (IPR '065). FLIR provides claim charts and citations to the testimony of Dr. Sandsten (Ex. 1006) in support of its contentions. *Id.* FLIR argues that Kulp discloses all the limitations of claim 1, expressly or inherently, except for the "refrigeration portion" limitation of claim 1. Paper 2, 41-43 (IPR '065). With respect to refrigeration, FLIR argues that it would have been obvious to locate the cooled filters and array disclosed in Kulp within the refrigeration portion disclosed in the Merlin User's Guide as it represents an obvious design choice. Paper 2, 43-44 (IPR '065) (citing Ex. 1006 ¶¶ 98-100).

FLIR provides claim charts, citations to the testimony of Dr. Sandsten and analysis in support of its contentions that (1) claims 27, 32-35, and 41 are unpatentable as obvious in view of Merlin Brochure, Strachan, and Spectrogon (Paper 2, 28-37 (IPR '065)); and (2) claims 24, 26, 36, and 57 are unpatentable as obvious in view of Merlin Brochure, Strachan, and OCLI (Paper 2, 38-41 (IPR '065)). FLIR relies on the filter characteristics disclosed in Spectrogon

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and OCLI for “the pass band for the filter configuration” limitations of dependent claims 24, 26, and 27.

With respect to Kulp (Ex. 1012) and the Merlin User’s Guide (Ex. 1011), FLIR provides claim charts, analysis and citations to the testimony of Dr. Sandsten in support of its contentions that Kulp and the Merlin User’s Guide render dependent claims 23, 33, and 35 (which depend from claim 1) unpatentable as obvious. Paper 2, 41-48 (IPR ’065). FLIR asserts the Kulp discloses every limitation of claims 1, 23, 33, and 35, except for the limitations for “an infrared sensor device located in the interior of the refrigerated portion” and “a single filter configuration located in the interior of the refrigerated portion” as recited in claim 1. *Id.* at 44-47. FLIR argues that

it would have been obvious, in view of the Merlin User’s Guide, to modify the camera of Kulp, which already discloses a cooled filter and a cooled infrared sensor device, to locate both the cooled filter and cooled infrared sensor device in the interior of a refrigeration portion, as disclosed in the Merlin User’s Guide.

*Id.* at 44; Ex. 1006 ¶¶ 99-100.

With respect to “the pass band for the filter configuration” limitations of dependent claims 25, 27, 28, 30, 32, 34, and 41, which depend from claim 1, FLIR provides citations to Spectrogon to disclose the filter characteristics, in combination with the Kulp and the Merlin User’s Guide to disclose the limitations of

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independent claim 1. Paper 2, 48-52 (IPR '065). Similarly, FLIR provides citations to OCLI in combination with Kulp and the Merlin User's Guide to disclose "the pass band for the filter configuration" and "optical bandpass filter" limitations of dependent claims 24, 26, 36, and 57. *Id.* at 53-54.

*2. Petitioner's '496 Patent Contentions*

FLIR also contends that the Merlin Brochure and Strachan render claims 1-5 and 9-20 of the '496 patent obvious. Paper 2, 14-48 (IPR '434). FLIR provides claim charts, analysis and citations to the testimony of Dr. Sandsten in supports of its contentions that independent claim 1, 18, 19, and 20 are unpatentable as obvious in view of the Merlin Brochure and Strachan. *Id.* at 14-47.

FLIR asserts that dependent claim 6, which depends from claim 1, is rendered unpatentable as obvious by Brengman, the Merlin Brochure and Strachan. *Id.* at 48-50. Finally, FLIR contends that dependent claim 7, which depends from claim 1, is rendered unpatentable as obvious by Hart, the Merlin Brochure and Strachan. *Id.* at 50-51. In support of its contentions, FLIR provides claim charts and citations to the testimony of Dr. Standsten showing that the combination of the Merlin Brochure and Strachan with Hart or Brengman discloses the limitations of dependent claims 6 and 7. *Id.* at 48-51.

*Appendix B**3. Patent Owner Contentions*

LSI contends that FLIR has not met its burden because none of the asserted prior art teaches a system for detecting or visualizing gas leaks under (1) “variable ambient conditions” as recited in the challenged independent claims or (2) using a “single filter configuration located in the interior of the refrigerated portion” as recited in the challenged claims. PO Resp. 1-2. LSI also argues that FLIR fails to articulate a fact-based rational underpinning for a person of ordinary skill in the art to combine the references. *Id.* at 2. Instead, LSI argues that the prior art teaches away from use of passive-IR to detect gas leaks. *Id.* Finally, LSI asserts that secondary considerations of non-obviousness show that the invention is non-obvious. *Id.* at 2-3. We address LSI’s contentions below.

*a. “Variable Ambient Conditions” and Under  
“Normal Operating Conditions”*

LSI contends that the inventive feature that differentiates the patents at issue from the prior art is the detection of leaks in the “real-world” setting. PO Resp. 24. The claim limitations requiring detection under “variable ambient conditions” (all challenged claims) and “normal operating conditions” (the challenged claims of the ’96 patent). As discussed above, we disagree with LSI’s contention that ambient conditions and normal operating conditions require operating under a “full range of normal operating conditions, such as different temperatures or sunlight; and would not encompass prior art systems that

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could image gases only within a narrow range of field conditions, such as temperature.” *Id.* at 27.

We are not persuaded by LSI because the claims at issue do not require imaging gas under any specific conditions. At oral argument, LSI argued that “the claims cover essentially or require a camera that can image a gas under the range of expected ambient-variable ambient conditions around the leak. .... [I]n order for this to work in the field that’s what it has to do.” Tr. 62:7-11. However, LSI concedes that claims at issue do not specify what the normal operating conditions would be and that such conditions would vary depending on the application. Tr. 62:23-24, 63:6-8. LSI’s restrictive reading of the claims is not supported by the specifications or claims of the ’496 or ’813 patents. As discussed above, we conclude that the broadest reasonable construction of “variable ambient conditions” (all challenged claims) and “normal operating conditions” (the challenged claims of the ’496 patent) is the ambient conditions of the area around the leak.

Accordingly, we are not persuaded by LSI’s argument that the imaging of gas in Strachan and Kulp under artificial or controlled conditions means that it does not teach the claim limitations for “variable ambient conditions” and “normal operating conditions.” PO Resp. 28-30. For example, LSI’s expert, Dr. Martini, agreed that Kulp only monitored the ambient temperature of the test, and did not strictly control the temperature. Ex. 1032, 42:11-43:7. Indeed, Kulp only discloses a passive IR system that imaged a gas plume whose shape and concentration was controlled as part of the test comparing active and

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passive IR gas detection. Ex. 1012, 270, 275. Although Kulp uses a sandpaper backdrop in his test, we credit the cross-examination testimony of LSI's expert Dr. Martini, who testified that the sandpaper was used to mimic the earth's surface and was used to maintain consistency between the tests of the active versus passive IR systems. Ex. 1032, 65:5-66:25.

We also disagree with LSI's characterization of Kulp as requiring that certain temperature and/or emissivity differences between gas and the background must always exist to image gas. PO Resp. 15. We agree with FLIR that Kulp's discussion of the differences in temperature between the gas and background acknowledges that some Delta-T (temperature difference between the background and target gas) is necessary for a passive IR system to detect gas. Reply 11 (citing Ex. 1036 ¶¶ 50, 53). We also credit the testimony of FLIR's witness, Dr. Sandsten, over LSI's witness, Dr. Martini, that Kulp imaged gases at different times of the day and at different temperatures. Ex. 1006 ¶ 55.

Furthermore, we are also not persuaded by LSI's proffered testimony characterizing Strachan as only imaging gases under artificially uniform conditions. PO Resp. 28 (citing Ex. 2084 and Ex. 2051). Because the '813 and '496 patent do not specify any particular conditions, LSI's argument and testimony is not consistent with what the claims require. Second, we do not find the testimony of Dr. Martini (Ex. 2084), Dr. Hausler and Dr. Hossack (Ex. 2051) cited by LSI to be persuasive on the disclosure of Strachan. PO Resp. 28. As Dr. Hausler, an



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LSI expert, stated under cross-examination, the physics of whether gas can be imaged depend on the relative difference in temperature (Delta-T) between the gas and the background, regardless of whether the conditions are controlled or uncontrolled. Ex. 1029, 83:9-84:3. We find that Strachan discloses that practical quality images of hydrocarbon gas can be obtained at various temperatures. Ex. 1008, 497; Reply 9. We also find that a person of ordinary skill in the art would understand that the study disclosed in Strachan is done to explore the feasibility of imaging gas in uncontrolled settings. *See* Ex. 1030, 71:19-24. Accordingly, we find that both Strachan and Kulp disclose the ambient or normal conditions recited in the challenged claims.

*b. “visible image of a leak” with a  
“single filter configuration”*

LSI contends that the Merlin Brochure and Merlin User’s Guide do not disclose producing a “visible image of a leak” with a “single filter configuration” as recited in the challenged claims. PO Resp. 35-38. We do not agree. First, we do not find convincing the testimony of Dr. Parrish (Ex. 2068) or Dr. Martini (Ex. 2084) regarding the filter wheel location in the Merlin references or whether the Merlin references read on the “single filter configuration” limitation. PO Resp. 35-38.

Second, the Merlin Brochure states that the chemical signatures in aircraft, rocket and missile exhaust can be performed with the “filter wheel option available for the Merlin Lab camera [which] permits wavelength selectivity

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for spectroscopy and signature analysis.” Ex. 1007, 3; Ex. 1036 ¶ 66. We credit FLIR’s witness, Dr. Sandsten, that this filter option is described as a cold filter and an InSb detector which supports that a person of ordinary skill in the art would understand that it is located in the single cooling unit of the disclosed camera. Ex. 1007, 6; Ex. 1006 ¶ 71; Ex. 1036 ¶ 71. Indeed, Dr. Parrish, LSI’s witness, agrees that the Merlin Brochure describes the cold filter and InSb detector as being located in the Dewar (refrigeration unit). Ex. 1033, 33:14-17. The Merlin User’s Guide also contains similar disclosure regarding the cold filter. Ex. 1011, 1-2, 51. Ex. 1039 ¶ 98.

We also disagree with LSI’s narrow understanding of a person of ordinary skill in the art as being limited to inserting a filter in the optical path outside of the refrigeration unit. PO Resp. 37. “A person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007). We find that the Merlin Brochure or Merlin User’s Guide teaches that cold filter can be factory-optimized for wavelength selectivity. Ex. 1007, 2; Reply 7. In addition, we find that FLIR has shown by a preponderance of the evidence that the prior art recognized the practical use of cold filters. Ex. 1036 ¶ 79; *see* Ex. 2027, 114 (stating that the filter should be “cryogenically cooled along with the [detector]” to “achieve the full effect of a narrow-band imaging system”).

In sum, we are not persuaded by FLIR that the combination of the Merlin User’s Guide with Kulp or the Merlin references with Strachan fails to disclose “a

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single filter configuration located in the interior of the refrigerated portion” as recited in the challenged claims.

*c. “visually detecting the leak based on the visible image under the variable ambient conditions” and “visually detecting a gas leak ... emanating from a component of a group of components in different locations”*

The challenged claims of the '496 patent recite “visually detecting the leak based on the visible image under the variable ambient conditions.”

LSI argues that the Merlin Brochure and Strachan cannot “detect” a leak because the references visually image known emissions whose location and composition are controlled. PO Resp. 39-40. As discussed above, we construed “leak” to include known or unknown emissions. We do not agree with LSI that “visually detecting” is not taught in the Merlin Brochure, which discloses imaging of jet exhaust and detection of chemical signatures in the exhaust. Ex. 1007, 3. Thus, LSI’s arguments are not well founded.

We also are not persuaded by LSI’s argument that Merlin Brochure does not disclose detecting leaks from a group of components. PO Resp. 41-42. We find that the exhaust from an aircraft indicates that the Merlin Brochure discloses monitoring of a group of components that make up the aircraft exhaust. *See* Reply 6 n.2. Indeed, the image in the Merlin Brochure shows imaging half of an aircraft and not only the aircraft’s exhaust. Ex. 1007, 3.

*Appendix B**d. Reason to Combine and Teaching Away*

LSI argues that a person of ordinary skill in the art would not have combined the teachings of the cited references because the references teach away from the passive infrared configuration. We disagree.

“A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the [inventor].” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). A reference does not teach away, however, if it merely expresses a general preference for an alternative invention but does not “criticize, discredit, or otherwise discourage” investigation into the invention claimed. *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). We will not, however, “read into a reference a teaching away from a process where no such language exists.” *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1364 (Fed. Cir. 2006).

LSI’s evidence that the Merlin references disclose an emission based instrument and that Kulp and Strachan disclose an absorption based instrument, does not show that the references teach away from their combination. Indeed, LSI’s citation to the testimony of Dr. Martini does not demonstrate that the Merlin references discourage their combination with Strachan or Kulp. To the contrary, the record shows that a person of ordinary skill in the art would have combined the filter teachings of Strachan with

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the camera disclosed in the Merlin references. Ex. 1030, 50:1-16, 84:14-85:19, 87:16-88:19, 160:4-14; *see* Ex. 1036 ¶ 22. Although LSI's witness, Dr. Hossack, disputes where the filter would have been placed on a Merlin camera, he does not dispute that Strachan discloses modifying a similar camera to detect gas. Ex. 1030, 50:1-16, 84:14-85:19, 87:16-88:19; 160:4-14.

LSI's argument that the combinations of the Merlin camera disclosed in the Merlin references would destroy the intended functionality of the camera and fundamentally alter its principle of operation is equally unpersuasive. *See* PO Resp. 49-52. LSI has not shown that modification of the Merlin camera as disclosed in the Merlin User's Guide or Brochure would no longer be useful for imaging gas as described. We credit the testimony of Dr. Sandsten in finding that the Merlin MID operates on the principles of thermography before and after modification as disclosed in Kulp and Strachan. Ex. 1036 ¶ 74. In addition, modification of such a camera is expressly taught by Strachan and Kulp. Therefore, regardless of whether the possibility of modifying the Merlin MID camera was disclosed in the Merlin references, the combination of Kulp and/or Strachan with the Merlin references teaches one of ordinary skill in the art that the standard filter could be replaced in a passive IR camera, such as the Merlin MID, to improve imaging. *See, e.g.*, Ex. 1030, 50:1-16, 84:14-85:19, 87:16-88:19; 160:4-14; Reply 15. Indeed, Strachan and Kulp both disclose that gas can be successfully imaged by optimizing the spectral selectivity of a passive IR system using a narrow bandpass filter tuned to the gases of interest. Kulp specifically discloses

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that a cold filter and Strachan includes a Dewar flask for cooling. Ex. 1008, 493; Ex. 1012, 270. LSI's arguments regarding the modifications of the camera disclosed in the Merlin references fail to address the teachings of the Merlin references in combination with Kulp and/or Strachan. *See In re Keller*, 642 F.2d 413, 426 (CCPA 1981) (attacking references individually cannot demonstrate non-obviousness; rather, the test is what the combined teachings of the references would have suggested to one of ordinary skill in the art).

LSI's contention that the references themselves teach away from their combination is mistaken. *See* PO Resp. 52-61. We are not persuaded by LSI's evidence and testimony that a person of ordinary skill in the art would have selected a different Merlin camera for gas detection and placed a warm filter behind the lens or on a filter wheel rather than insert a narrow bandpass cold filter into the Dewar. PO Resp. 52-57. The fact that the Merlin Brochure discloses multiple cameras for imaging gas does not indicate that it discourages the use of the Merlin MID camera over the uncooled Micro bolometer camera. Reply 16. We find that a person of ordinary skill in the art interested in imaging gas within the range of the Merlin MID camera would have modified the filter as disclosed by Strachan and Kulp. Reply 13. Use of the cold filters disclosed in Strachan and Kulp in the camera of the Merlin references amounts to use of a known element for its known use to achieve an expected result. *KSR*, 550 U.S. at 416.

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We also disagree with LSI's argument that Strachan and Kulp both teach that passive IR does not work under normal operating (or variable) ambient conditions, such that a person of ordinary skill in the art would not look to a passive IR system as a solution for gas leak detection in the field. PO Resp. 59. LSI's characterization of Strachan and Kulp is not supported by the plain reading of the references themselves, which do not criticize, discredit, or otherwise discourage use of passive IR. To the contrary, Strachan and Kulp expressly describe imaging gas using passive IR imaging with appropriate narrow cold filters and suggest improvements for future passive IR gas imaging systems. *See* Ex. 1008, 493; Ex. 1012, 270. In addition, LSI's erroneous understanding of Strachan and Kulp is based on the narrow construction of normal operating (or variable) ambient conditions, which we previously rejected.

Finally, we are not persuaded by LSI's argument that active IR or warm filtering are taught in Strachan and Kulp as solutions for imaging gas where the temperature difference between the gas and background is small, (the low Delta-T problem). PO Resp. 60. The claims at issue in the challenged patents do not require any specific operating conditions, nor do they require any specific low or high Delta-T. Thus, we are not persuaded by Dr. Martini's testimony that Kulp and Strachan teach away when there is a low Delta-T. PO Resp. 58-60.

Even assuming that the Merlin Brochure does not disclose modification of the cold filter as LSI argues, such an omission is not teaching away. In addition, with

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respect to LSI's arguments regarding the permanence of the modification, this also is not teaching away. Choosing where to modify the Merlin MID camera as disclosed in the Merlin Brochure or Merlin User's Guide with the cold filter disclosed in Kulp or Strachan is a simple design choice. The preponderance of the evidence indicates that several prior art references taught putting cold filters narrowband filters inside the refrigerator portion to improve imaging of gas. Ex. 2027, 114; Ex. 1031, 39:22-41:10 (stating that it was known to put the filter and sensor in the same refrigerator portion).

We also do not agree with LSI's frequent reference to FLIR's analysis as being based on hindsight. PO Resp. 23, 61, 66-70. LSI's argument mischaracterizes the disclosures of the prior art, in particular Strachan and Kulp, and ignores the contemporary evidence that filters should be cooled to improve narrowband imaging systems. *See* Ex. 1008, 497; Ex. 1012, 276; Ex. 2027, 114; Ex. 1031, 18:19-19:21, 53:17-54:2; Ex. 1033, 33:14-17, 35:10-36:7; Ex. 1030, 97:21-24; Ex. 1032, 110:20-111:6; Ex. 1039 ¶¶ 98-101; Ex. 1045 ¶ 5.

Based on the full record, we find, by a preponderance of the evidence, that FLIR has provided articulated reasons with rational underpinnings for the proposed combinations of prior art. FLIR's evidence shows that combinations of the Merlin Brochure with Strachan or the Merlin User's Guide with Kulp is the combination of known elements that yield predictable results. *See* Paper 2, 17-18 (citing Ex. 1006 ¶ 55), 20-21 (citing Ex. 1006 ¶ 60) (IPR '065); Paper 2, 37-38 (citing Ex. 1006 ¶ 81) (IPR '411).



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In addition, we find by a preponderance of the evidence that the prior art demonstrates that it would have been an obvious design choice to one skilled in the art to replace the filters disclosed in Strachan and Kulp to target hydrocarbon gases of interest using the camera disclosed in the Merlin Brochure and Merlin User's Guide. Paper 2, 38-39 (citing Ex. 1006 ¶¶ 81-82) (IPR '411). Accordingly, we do not agree with LSI that FLIR's expert testimony is conclusory. PO Resp. 23, 61, 67-68.

*4. Secondary Considerations*

LSI argues that there is overwhelming evidence that demonstrates the nonobviousness of the challenged claims. PO Resp. 74-83. In evaluating whether an invention would have been obvious, “[s]uch secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). While the party seeking to demonstrate nonobviousness has the burden to introduce evidence supporting such objective indicia, see *In re Huang*, 100 F.3d 135, 139 (Fed. Cir. 1996), the ultimate burden of persuasion never shifts to Patent Owner, see 35 U.S.C. § 316(e).

Objective indicia should be considered along with all of the other evidence in making an obviousness determination. See *Eurand, Inc. v. Mylan Pharm. Inc. (In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.)*, 676 F.3d 1063, 1076-77

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(Fed. Cir. 2012) (“It is to be considered as part of all the evidence, not just when the decisionmaker remains in doubt after reviewing the art.”) (quoting *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538-39 (Fed. Cir. 1983)). Factual inquiries for an obviousness determination include secondary considerations based on evaluation and crediting of objective evidence of nonobviousness. *Graham*, 383 U.S. at 17. Secondary considerations may include any of the following: long-felt but unsolved needs, failure of others, unexpected results, commercial success, copying, licensing, and praise.

“For objective evidence to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention.” *GPAC*, 57 F.3d at 1580. In particular, the objective indicia “must be tied to the novel elements of the claim at issue” and must “be reasonably commensurate with the scope of the claims.” *Institut Pasteur & Universite Pierre Et Marie Curie v. Focarino*, 738 F.3d 1337, 1347 (Fed. Cir. 2013) (quoting *Rambus Inc. v. Rea*, 731 F.3d 1248, 1257 (Fed. Cir. 2013)).

LSI provides voluminous evidence the inventor, David Furry, modified an Indigo MID camera (now manufactured by FLIR) to produce a prototype passive infrared camera and achieve unexpected results. PO Resp. 75 (citing Ex. 2068 ¶ 15, 18, 30-38; Ex. 2063 ¶¶ 28-29; Ex. 2051 ¶ 80). LSI contends that Mr. Furry’s modified camera “allowed the operator to quickly and efficiently identify the source of hydrocarbon leaks, and, perhaps most importantly for field use, *it worked under normal plant*

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*operating conditions and variable ambient conditions, such as variable atmospheric temperatures and wind conditions.”* PO Resp. 75 (emphasis added) (citing Ex. 2082, 001-002, 005, 007, 013-16, 17-32, 33-38).

As discussed above, the challenged claims do not recite or require any specific conditions. Indeed, the challenged claims require imaging of known or unknown gas under “some” operating conditions. Thus, there is no nexus that is tied to the novel elements of the claims at issue or that are reasonably commensurate with the scope of the claims. Contrary to LSI’s position that the Furry camera was the only solution that worked at field trials of leak detection systems (PO Resp. 75-76), the evidence shows that all of the tested imaging systems successfully imaged gas. Ex. 2009, ES-7-ES-9, 2-15, 4-11; Ex. 1036 ¶ 109. The record shows that Kulp and Strachan both successfully imaged gas using passive IR cameras with appropriate cold filters.

Although there is evidence that the FLIR-marketed GasFindIR camera that was initially licensed by Mr. Furry and LSI was a market leader for leak detecting cameras (PO Resp. 76-77), LSI has not shown a sufficient nexus between the novel elements of the claims at issue and the GasFindIR camera or its predecessors.

*a. Long Felt Need*

LSI contends that the long felt need to find alternatives to the EPA’s Method 21 for leak detection and repair and the failure of others to find a workable solution supports its contentions of nonobviousness. PO Resp. 77-78. “Evidence

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that an invention satisfied a long-felt and unmet need that existed on the patent's filing date is a secondary consideration of nonobviousness." *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1332 (Fed. Cir. 2009). To show a long-felt need, LSI must introduce evidence to show when such a need first arose and how long this need was felt, and must introduce evidence to show that this need was met by the patented invention. *See id.* "[L]ong-felt need is analyzed as of the date of an articulated identified problem and evidence of efforts to solve that problem." *Tex. Instruments, Inc. v. U.S. Int'l Trade Comm'n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993).

As discussed above, LSI has not provided persuasive evidence showing the intrinsic nexus to the challenged claims and how the claimed invention resolved the long-felt need. Although evidence shows that camera-based solutions have been adopted as alternatives to the EPA's Method 21, the cameras are not limited to LSI's claimed passive camera. Ex. 1034, 90:5-14, 96:2-97:1. Indeed, LSI has not shown that the claimed invention created the alternative to Method 21. Instead, we find that the evidence shows that active and passive IR cameras successfully imaged gas emissions in the API tests and in the prior art. Ex. 2009, ES-7-ES-9, 2-15, 4-11; Ex. 1008; Ex. 1012. The novel functions and features that LSI identifies as necessary "to develop a workable solution for imaging gas leaks" and the failure of others to find a workable solution are not commensurate in scope with the challenged claims, which broadly require imaging gas at some variable ambient conditions.

*Appendix B**b. Skepticism of Others and Teaching Away*

We are not persuaded by LSI's evidence that the prior art teaches away from the use of modified passive IR cameras for gas leak detection. PO Resp. 78-79. For the reasons discussed above, we do not find that the prior art references teach away from their combination. In addition, LSI's evidence of skepticism of others does not show evidence based on the claimed limitations of the challenged patents. At best, LSI's evidence shows the business-related issues Mr. Furry encountered in obtaining and modifying the passive IR camera. PO Resp. 79 (citing Ex. 2068 ¶¶ 16, 21; Ex. 2176-Ex. 2178 (deposition exhibits to Ex. 2063)). Indeed, evidence shows that financial considerations in the ordering and modifications prompted the skepticism LSI cites. Ex. 1031, 149:25-152:11. In addition, LSI's evidence of unexpected results when Mr. Furry built his passive IR camera is not commensurate with the scope of the challenged claims, nor do they comport with the prior art, Strachan and Kulp, which disclose imaging gas at variable conditions.

*c. Commercial Success, Copying,  
and Industry Praise*

Commercial success is relevant only if it flows from the merits of the invention claimed. *Sjolund v. Musland*, 847 F.2d 1573, 1582 (Fed. Cir. 1988). Thus, a "nexus" is required between the merits of the claimed invention and any objective evidence of nonobviousness offered, if that evidence is to be given substantial weight en route to a conclusion on obviousness. *Stratoflex*, 713 F.2d at 1539;

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*see also Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311-12 (Fed. Cir. 2006) (“Evidence of commercial success, or other secondary considerations, is only significant if there is a nexus between the claimed invention and the commercial success.”).

LSI has presented evidence that FLIR developed and marketed its GasFindIR camera under license and a business development agreement. PO Resp. 81-82. However, LSI has not sufficiently tied the success to the novel elements of the claim at issue. Indeed, the unmodified Merlin MID camera as disclosed in the Merlin references predates the GasFindIR camera and Mr. Furry’s Hawk camera, which LSI contends FLIR copied. PO Resp. 81 (stating that FLIR “took the specifications for David Furry’s Hawk camera and copied them exactly to make the GasFindIR camera”)

Even assuming *arguendo* that the GasFindIR camera is a copy of Mr. Furry’s Hawk Camera and shows evidence of commercial success, the only feature LSI identifies with a nexus to the claimed invention that is not present in the preexisting Merlin MID camera is the use of a narrowband cold filter that is described in marketing material for the GasFindIR camera. PO Resp. 81 (citing Ex. 2082, 020). Such objective evidence of nonobviousness cannot overcome the disclosures that narrowband cold filters were disclosed in the prior art, Kulp and Strachan. *See Tokai Corp. v. Easton Enters., Inc.*, 632 F.3d 1358, 1371 (Fed. Cir. 2011).

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LSI also has failed to show that the commercial praise (PO Resp. 82-83) is due to novel aspects of the claimed invention. For example, LSI's emphasis on Mr. Furry inventing the first "working system for imaging gas leaks under variable field conditions" (PO Resp. 83 (citing Ex. 2068 ¶¶ 33-35)) is not commensurate in scope with the claims which are not limited to working under field conditions as LSI asserts.

*d. Secondary Consideration Conclusion*

Where the evidence shows that the commercial success derived from some aspect of the prior art, or was the result of economic and commercial factors unrelated to the claimed limitations, evidence of commercial success will not be sufficient to demonstrate nonobviousness of a claimed invention. *See In re DEC*, 545 F.3d 1373, 1384 (Fed. Cir. 2008); *see also Tokai*, 632 F.3d at 1369-70 (finding that secondary considerations did not overcome obviousness case).

In the present case, even where evidence of commercial success and copying is present, the nexus between the claimed invention and secondary consideration evidence that LSI relies on is not commensurate with the claims at issue. Having considered the full record, we find that LSI's evidence of secondary considerations, including evidence of commercial success, copying and industry praise, does not outweigh FLIR's strong prima facie case of obviousness. *See Tokai*, 632 F.3d at 1370; *see also Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010) (discussing cases). LSI's evidence regarding normal field

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condition success is not commensurate in scope with the patent claims at issue, nor are they compelling enough to rebut the strong prima facie showing of obviousness.

*5. Conclusion as to Obviousness*

Based on the full record including LSI's evidence of secondary considerations, we find that FLIR has shown by a preponderance of the evidence in IPR20 14-00411 that the Merlin Brochure and Strachan disclose claims 1-4, 6, 8-22, 31, 37-40, 42-56, and 58 of the '813 patent; the Merlin Brochure, Strachan, and Piety disclose claims 5 and 7 of the '813 patent; the Merlin Brochure and Strachan disclose claims 1-5 and 9-20 of the '496 patent; the Merlin Brochure, Strachan, and Brengman disclose claim 6 of the '496 patent; and the Merlin Brochure, Strachan, and Hart disclose claim 7 of the '496 patent.

Finally, in IPR2015-00065, FLIR has shown by a preponderance of the evidence that the Merlin Brochure and Strachan disclose claims 23, 25, 28, and 30 of the '813 patent; the Merlin Brochure, Strachan, and Spectrogon disclose claims 27, 32-35, and 41 of the '813 patent; the Merlin Brochure, Strachan, and OCLI disclose claims 24, 26, 36, and 57 of the '813 patent; the Merlin User's Guide and Kulp disclose claims 23, 33, and 35 of the '813 patent; the Merlin User's Guide, Kulp, and Spectrogon disclose 25, 27, 28, 30, 32, 34, and 41 of the '813 patent; and the Merlin User's Guide, Kulp, and OCLI disclose 24, 26, 36, and 57 of the '813 patent.



*Appendix B**F. Motions to Seal*

LSI filed unredacted and redacted versions of the Patent Owner Response (Papers 51 and 64 (IPR '411)) and redacted exhibits (Ex. 2073, Ex. 2074, and Ex. 2082) along with unopposed Motions to Seal (Papers 48, 61, and 98), a default protective order (Paper 49) and stipulated protective order (Paper 50). Identical redacted papers, unopposed motions, and protective orders were filed in IPR2015-00065 (*see* Papers 34, 35, 36, 37; Ex. 2113, Ex. 2114, Ex. 2122).

There is a strong public policy in favor of making information filed in an *inter partes* review open to the public, especially because the proceeding determines the patentability of claims in an issued patent and, therefore, affects the rights of the public. Under 35 U.S.C. § 316(a) (1) and 37 C.P.R. § 42.14, the default rule is that all papers filed in an *inter partes* review are open and available for access by the public; however, a party may file a concurrent motion to seal and the information at issue is sealed pending the outcome of the motion. It is only “confidential information” that is protected from disclosure. 35 U.S.C. § 316(a)(7); *see* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,760 (Aug. 14, 2012).

The standard for granting a motion to seal is “for good cause.” 37 C.P.R. § 42.54(a). The party moving to seal bears the burden of proof in showing entitlement to the requested relief, and must explain why the information sought to be sealed constitutes confidential information. 37 C.P.R. § 42.20(c). As set forth in the Office Patent Trial

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Practice Guide, there is an expectation that information will be made public if identified in this Final Written Decision. 77 Fed. Reg. at 48,761.

Based on our review, we conclude that Exhibits 2073, 2074, and 2082 in IPR '411 and Exhibits 2113, 2114, and 2122 in IPR '065 and the unredacted Patent Owner Response currently filed under seal contain confidential business information. The contents of those documents that are asserted as constituting confidential business information have not been relied upon in this Final Written Decision. We are persuaded that good cause exists to have those documents remain under seal.<sup>16</sup>

### III. CONCLUSION

In IPR2014-00411, FLIR has demonstrated by a preponderance of the evidence that claims 1-22, 31, 37-40, 42-56, and 58 of the '813 patent, and claims 1-7 and 9-20 of the '496 patent are unpatentable based on the following grounds of unpatentability:

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16. The sealed documents record will be maintained undisturbed pending the outcome of any appeal taken from this Final Written Decision. At the conclusion of any appeal proceeding, or if no appeal is taken, the documents will be made public. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. at 48,760-61. Either party may file a motion to expunge the sealed documents from the record pursuant to 37 C.P.R. § 42.56. Any such motion will be decided after the conclusion of any appeal proceeding or the expiration of the time period for appealing.

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(1) Claims 1-4, 6, 8-22, 31, 37-40, 42-56, and 58 of the '813 patent under 35 U.S.C. § 103(a) over the Merlin Brochure and Strachan;

(2) Claims 5 and 7 of the '813 patent under 35 U.S.C. § 103(a) over the Merlin Brochure, Strachan, and Piety;

(3) Claims 1-5 and 9-20 of the '496 patent under 35 U.S.C. § 103(a) over the Merlin Brochure and Strachan;

(4) Claim 6 of the '496 patent under 35 U.S.C. § 103(a) over the Merlin Brochure, Strachan, and Brengman; and

(5) Claim 7 of the '496 patent under 35 U.S.C. § 103(a) over the Merlin Brochure, Strachan, and Hart.

In IPR2015-00065, FLIR has demonstrated by a preponderance of the evidence that claims 23-28, 30, 32-36, 41, and 57 of the '813 patent are unpatentable based on the following grounds of unpatentability:

(1) Claims 23, 25, 28, and 30 of the '813 patent under 35 U.S.C. § 103(a) over the Merlin Brochure and Strachan;

(2) Claims 27, 32-35, and 41 of the '813 patent under 35 U.S.C. § 103(a) over the Merlin Brochure, Strachan, and Spectrogon;

(3) Claims 24, 26, 36, and 57 of the '813 patent under 35 U.S.C. § 103(a) over the Merlin Brochure, Strachan, and OCLI;

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(4) Claims 23, 33, and 35 of the '813 patent under 35 U.S.C. § 103(a) over the Merlin User's Guide and Kulp;

(5) Claims 25, 27, 28, 30, 32, 34, and 41 of the '813 patent under 35 U.S. C. § 103(a) over the Merlin User's Guide, Kulp, and Spectrogon; and

(6) Claims 24, 26, 36, and 57 of the '813 patent under 35 U.S.C. § 103(a) over the Merlin User's Guide, Kulp, and OCLI.

IV. ORDER

For the reasons given, it is

ORDERED that, based on a preponderance of the evidence, claims 1-28 and 30-58 of U.S. Patent No. 8,426,813 and claims 1-7 and 9-20 of U.S. Patent No. 8,193,496 are held unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.P.R. § 90.2.

**APPENDIX C — DENIAL OF REHEARING OF  
THE UNITED STATES COURT OF APPEALS FOR  
THE FEDERAL CIRCUIT, DATED MAY 3, 2017**

UNITED STATES COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT

2016-1299, 2016-1300

LEAK SURVEYS, INC.,

*Appellant,*

v.

FLIR SYSTEMS, INC.,

*Appellee.*

Appeals from the United States Patent and Trade-  
mark Office, Patent Trial and Appeal Board in No.  
IPR2014-00411, IPR2014-00434, IPR2015-00065.

**ON PETITION FOR PANEL REHEARING  
AND REHEARING *EN BANC***

Before PROST, *Chief Judge*, NEWMAN, LOURIE, BRYSON\*,  
DYK, MOORE, O'MALLEY, REYNA, WALLACH, TARANTO, CHEN,  
HUGHES, and STOLL, *Circuit Judges*.

PER CURIAM.

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\*Circuit Judge Bryson participated only in the decision  
on the petition for panel rehearing.

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**ORDER**

Appellant Leak Surveys, Inc. filed a combined petition for panel rehearing and rehearing *en banc*. A response to the petition was invited by the court and filed by Appellee FLIR Systems, Inc. The petition was referred to the panel that heard the appeal, and thereafter the petition for rehearing en banc was referred to the circuit judges who are in regular active service.

Upon consideration thereof,

IT IS ORDERED THAT:

- (1) The petition for panel rehearing is denied.
- (2) The petition for rehearing *en banc* is denied.

The mandate of the court will issue on May 10, 2017.

For The Court

May 3, 2017  
Date

/s/ Peter R. Marksteiner  
Peter R. Marksteiner  
Clerk of Court

APPENDIX D — AUDIO CD OF THE  
UNITED STATES COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT ORAL  
ARGUMENT, DATED JANUARY 9, 2017  
AND ATTACHED TO THE PETITION COVER